Published in *Journal of Finance,* 2002, pp. 2479-2506.

Learning about Internal Capital Markets from Corporate Spinoffs[*]

Robert Gertner
University of Chicago and NBER

Eric Powers
University of South Carolina

David Scharfstein
Massachusetts Institute of Technology and NBER

First Draft: May 1999
This Draft: June 2001

[*]The authors thank seminar participants at the 1999 NBER Summer Institute, 2000 Eastern Finance Association Convention, London Business School, University of Chicago and University of South Carolina as well as Jan Mahrt-Smith, Vikas Mehrotra, Ted Moore, Greg Niehaus, Henri Servaes, Anil Shivdasani, Jeremy Stein, René Stulz and two anonymous referees for helpful comments.

Learning about Internal Capital Markets from Corporate Spinoffs

ABSTRACT

This paper examines the investment behavior of firms before and after they are spun off from their parent companies. We show that investment after the spinoff is significantly more sensitive to measures of investment opportunities (e.g. industry Tobin's Q or industry investment) than it is before the spinoff. Spinoffs tend to cut their investment in low Q industries and increase their investment in high Q industries. These changes are observed primarily in spinoffs of firms in industries unrelated to the parents' industries and in spinoffs where the stock market reacts favorably to the spinoff announcement. Our findings point to the possibility that one effect of spinoffs is to improve the allocation of capital.

The prevailing model of the firm in corporate finance envisions money flowing in from the capital and product markets and flowing out as investment spending, dividends, and debt payments. A recent line of research has been examining what actually happens when the money is inside the firm. How, for example, does corporate headquarters allocate funds across business and geographic units? If information and agency problems exist between headquarters and the external capital market --- a theme that runs through a good deal of the corporate finance literature --- does it also exist between headquarters and business units in the internal capital market? If so, do such problems distort investment allocations within the firm?

Understanding how internal capital markets work is important for two reasons. First, the relative efficiency of internal and external capital market transactions is a critical element in defining the boundaries of the firm, much in the same way that the relative efficiency of internal and external product-market transactions is important (Coase, 1937). Second, internal capital markets are an empirically important mechanism by which capital is allocated across and within lines of business. Indeed, most corporate investment is financed with internally generated cash flow over which the external capital market has limited control (MacKie-Mason, 1990).

There are mixed views on how well internal capital markets function. The critical question is under what circumstances are internal capital markets more or less efficient than external capital markets in allocating resources to businesses with good investment opportunities, and away from businesses with poor investment opportunities. Alchian (1969) and Williamson (1970) argue that internal capital markets are more efficient than external markets because corporate headquarters is likely to be better informed than

external suppliers of capital about investment opportunities.[1] By contrast, Meyer, Milgrom and Roberts (1992), Scharfstein and Stein (1998), Rajan, Servaes and Zingales (2000) and Wulf (1997) argue that rent-seeking by divisional managers can distort the functioning of internal capital markets, inducing corporate headquarters to allocate excessive capital to divisions with poor investment opportunities where rent-seeking incentives are strongest.[2]

A growing empirical literature analyzes the workings of internal capital markets. Lamont (1997) for example, shows that when oil prices fell dramatically in 1986, diversified oil companies with businesses unrelated to oil, made across-the-board cuts in capital expenditures even though investment prospects in the non-oil businesses seem not to have changed as a result of the oil-price decline. While this study shows that companies use the cash flow generated by one division to cross-subsidize the others --- essentially that an internal market exists --- it does not tell us whether cross-subsidization is efficient or not.

The subsequent literature, by contrast, attempts to address this issue. Shin and Stulz (1998) present evidence that when capital is reallocated across divisions it does not seem to go in any systematic way to the divisions with the better investment opportunities. Scharfstein (1998) shows that investment by conglomerate divisions tends to be less sensitive to Tobin's Q than investment by more focused firms. In addition, divisions tend to invest more than focused firms in low Q industries and less than focused firms in high Q industries. This problem is more pronounced in firms where management has small ownership stakes, with correspondingly weak incentives to make efficient investment allocations. Similarly, Rajan, Servaes and Zingales (2000) show that

conglomerates invest more than stand-alone firms in industries with poor investment opportunities and that this effect is more pronounced in conglomerates that operate in businesses with very different investment opportunities.

This paper takes a different approach to these issues by examining spinoffs of multi-divisional companies. In a spinoff, the parent company establishes one of its divisions as a new publicly-traded company and distributes the shares of this company to the parent's existing shareholders. It is almost always structured as a tax-free transaction with no cash flow implications to the parent, spinoff, or shareholders.[3] The goal of this paper is to understand how the allocation of capital changes when a division is spun off.

There are several advantages of this approach. The main advantage is that we can compare the investment behavior of the same business in two different regimes for allocating capital --- an internal capital market and an external capital market.[4] This addresses one criticism of previous work --- that segments of conglomerates are somehow different than stand-alone firms in some unobservable way and thus should exhibit different investment behavior. We examine spinoffs rather than other kinds of divestitures such as equity carveouts or asset sales because spinoffs do not generate cash for either party. In this respect, we believe spinoffs are a well structured "natural experiment" for our analysis since there is no real change in financial resources. Thus, one is less likely to argue that a spinoff changes investment behavior because it changes the firm's financial resources, rather than changing underlying investment decisions.[5]

The second reason to look at spinoffs is that we do not have to rely as heavily on Compustat business segment data as have previous studies of internal capital markets. Beginning in December 1977, firms were required to report key operating information

(e.g. sales, assets, capital expenditures) for particular industries if they accounted for more than 10% of a company's consolidated sales, assets, or profits. Unfortunately, the reported segments may not correspond to an actual business unit, and may also lump together business units in different industries. In a spinoff, however, the first annual report includes pro-forma financial statements for two or more years while the spinoff was part of the parent company. These data are more comprehensive than the limited information provided in the segment data, and are more likely to correspond to an actual business unit in the firm.

As a caveat, it is important to keep in mind that companies choosing to spin off divisions are not a random sub-sample of public companies. If undertaking a spinoff is motivated by the desire to eliminate internal capital misallocation, then our sample is biased towards companies where investment misallocation is particularly severe. Thus, one must be careful when drawing conclusions about the overall efficiency of internal capital markets based on what we observe in spinoffs. Nevertheless, if an inefficient internal capital market is indeed one of the rationales behind a spinoff, then a spinoff is probably a good place to look for signs of such inefficiencies.

The evidence that we present is generally consistent with the view that investment is distorted in the internal capital markets of firms that subsequently spin off divisions. Basic investment theory predicts that firms should invest more when they have better investment opportunities; empirically this usually takes the form of the *Q* theory in which investment opportunities are measured by the ratio of the market value of the firm to the replacement cost of its assets. According to the *Q* theory, firms should invest more as *Q* rises. We examine the extent to which this is true before and after the spinoff. In

particular, we estimate the sensitivity of the spinoff firm's investment to industry *Q* while the spinoff is a subsidiary of the parent and afterwards when the spinoff is an independent firm.

Overall, we find an increased sensitivity of investment to *Q* after the spinoff. This increased sensitivity is more pronounced when the spinoff operates in industries that are unrelated to the parent's industry, and when the stock market responds favorably to the announcement of the spinoff. We also find that firms in low Q industries tend to cut investment relative to their industry peers after the spinoff, while firms in high Q industries tend to increase their investment relative to industry peers. Spinoff firms' investment also moves more closely in tandem with the investment of stand-alone firms after the spinoff. This effect is also more pronounced for unrelated spinoffs and for spinoffs in which the parent's stock price rises considerably in response to the announcement.

There is a large body of prior research on spinoffs. Researchers have documented that parent companies experience positive cumulative abnormal excess returns (CAR's) at the announcement of a spinoff (Schipper and Smith (1983), Hite and Owers (1983), and Miles and Rosenfeld (1983)). Spinoffs themselves experience positive long-term excess stock returns (Cusatis, Miles, and Woolridge (1993)) and improvements in operating performance (Woo, Willard, and Daellenbach (1992) and Daley, Mehrotra, and Sivakumar (1997)). There is also increased analyst coverage and greater accuracy in analyst forecasts following spinoffs (Gilson, Healy, Noe and Palepu (1999) and Krishnaswami and Subramanian (1999)). Dittmar and Shivdasani (2000) look at the change in investment behavior of *parent* companies after they *divest* businesses. They

find that these firms seem to improve the internal allocation of capital and that they tend to increase their rate of investment, using the proceeds of the divestiture for funding. As far as we know, we are the first authors to explore actual changes in investment behavior of spinoff firms.

The remainder of the paper is organized as follows. Section I describes the data sources and the construction of the sample. Section II summarizes some of the key elements of the data. Section III analyzes the change in investment behavior before and after the spinoff. Section IV considers alternative interpretations of our findings. Section V concludes the paper.

I. Data and Construction of the Sample

We start with a list of 324 spinoffs from Securities Data Corporation's Mergers and Acquisitions Database, occurring between 1981 and 1996. To be included in our sample, a spinoff must satisfy the following criteria: (1) Compustat and CRSP data are available for at least one year after the spinoff transaction; (2) a copy of the spinoff's first annual report is available; (3) Compustat and CRSP data are available for the parent before the spinoff; (4) the spinoff is not a bank, financial services, insurance firm or financial holding company; (5) we can verify that the transaction is actually a spinoff by checking the annual report or a Lexis-Nexis news report; (6) the spinoff is a "clean" transaction in which the parent company goes from 100% ownership to 0% ownership through a *pro rata* distribution of shares.

We eliminate 31 spinoffs because they are not included in the Compustat or CRSP databases. We drop 8 spinoffs because Compustat or CRSP data are not available

for the parent; 5 spinoffs because we are unable to find annual reports on the spinoffs; and 51 spinoffs with SIC codes between 6000-6500 (financial service and insurance firms). We are unable to verify that a spinoff actually occurred in twelve instances and drop these firms as well.

Finally, we eliminate 65 spinoffs from the sample because they are not "clean" transactions. In several instances, the company was a spinoff of a prior equity carve-out where the parent had previously sold a portion of its ownership in the spinoff division in a public offering. Others are actually rights offerings rather than simple *pro rata* distributions of shares. Still others are in fact joint ventures with one parent deciding to relinquish its ownership interest in the venture by spinning off its share. The remaining 26 spinoffs are part of much more complex restructurings such as Morris Trust transactions where a spinoff occurs immediately prior to the merger of the parent with another firm. The complexity of these remaining transactions renders them unsuitable for our purposes. The final sample then consists of 160 corporate spinoffs.

Spinoff financial data are generally available on Compustat for the first year in which the spinoff operates as an independent entity. In about half the spinoffs, Compustat reports one year of pre-spinoff data. For the other half of the sample and for earlier years, we obtain pre-spinoff financial data from the pro-forma data in the first annual report. The annual report includes income and cash flow statement data for up to three years before the spinoff and balance sheet data for up to two years before the spinoff. In addition, annual reports typically include a table of summary financial data with five years of the most important balance sheet and income statement data such as net income and total assets. Combining all of the available data generally provides two to

three years of usable pre-spinoff operating profit and capital expenditure data for the spinoff. Parent company financial data comes exclusively from Compustat. Data for both spinoffs and parents run through 1998.

The combined pro-forma and Compustat data are aligned into an event time panel of years -5 to +5 where year 0 is the fiscal year during which the spinoff occurs. Thus, year +1 constitutes the first full year of independent operations for the spinoff, while year -1 is the last full year of operations inside the parent. We have full data on most spinoffs beginning in year -2 (145 out of 160) running through year +3 (135 out of 160). Spinoffs drop out of the sample over time principally because they are acquired or merge. It is important to note that the assets of the spinoff remain on the books at their historical book value. Because no sale occurs, assets are not revalued to market values. This allows us to make meaningful comparisons of accounting data before and after the spinoff.

In the analysis, we use data from firms that operate in the same industries as the spinoffs to provide various benchmarks. Because many firms operate in multiple industries, we confine our comparison firms to "stand-alones," i.e., firms that operate in only one industry. To identify stand-alones, we use Compustat segment data, which breaks out key operating data (sales, assets, operating income, capital expenditures, and depreciation) by principal lines of business. Firms are considered to operate in only one industry if, in their Compustat segment data, they report 100% of their sales in a single industry. After stand-alone firms are identified, we calculate industry median values (using Compustat data for the entire stand-alone firm) for items such as capital expenditures normalized by assets and Q. Spinoff and parent firms are excluded from all industry median calculations.

Our baseline definition of an industry is at the four-digit SIC code level. A median for an industry is calculated if there are five or more stand-alone firms available for that particular industry. Median values are also calculated for all three, two and one digit industries in the same manner. Matching is then done at the most disaggregated level having at least five stand-alone firms.

Parents and spinoffs themselves are often comprised of multiple segments in different industries. In comparing these firms to an industry median, we need to take a weighted average of the various industries in which the firm operates. We weight by segment assets and calculate a "chop-shop" median.[6] For example, in the Kenner Parker Toys spinoff from General Mills in 1985, Kenner Parker Toys reports a Toys and Games segment (SIC 3944) with $419.2 in assets (all dollar values reported in millions unless otherwise specified.) General Mills reports 3 segments: Consumer Foods (SIC 2043), Restaurants (SIC 5812) and Specialty Retailing (SIC 5621) with assets of $1,091.8, $467.8, and $195.5 respectively. Thus, the industry, or "chop-shop" ratio of capital expenditures to assets for Kenner Parker Toys is simply the industry median for SIC 3944. For General Mills, the industry ratio is the asset-weighted average of 62% SIC 2043, 27% SIC 5812 and 11% SIC 5621.

Because spinoff segment data is unavailable prior to year –1, we use segment weights from the earliest available year when calculating chop-shop industry values for pre-spinoff years. For example, to calculate a chop-shop value for year –2 or -3, we use the segment data from year –1 (50% of sample) or year 0 if year –1 is not available. Note that while the weights might be from a later year, the industry median values are always

from the appropriate year. In Section IV, we explore whether this approach introduces any biases that may drive our results.

Two key variables in the analysis are our measures of investment and investment opportunity. Since R&D data are not widely available for the spinoff firms (and certainly not before the spinoff), we focus on capital expenditures as our measure of investment. Capital expenditures are normalized by assets. We use end-of-year assets rather than start-of-year assets in this normalization because end-of-year assets allows us to analyze more years of pre-spinoff data and, if there are acquisitions or asset sales during the year, it normalizes by a more appropriate number.

Our primary measure of investment opportunities is the market value of the firm divided by the book value of assets, a proxy for Tobin's Q.[7] We calculate the market value of the firm as the book value of assets plus the market value of common equity less the sum of the book value of common equity and balance sheet deferred taxes.[8]

At times, we break out the analysis into two subsamples of spinoffs, those in industries related to the parents' industries and those in industries unrelated to the parents' industries. Coming up with a measure of relatedness is not straightforward. It is standard in the literature to define two businesses as unrelated if they operate in different two-digit SIC codes. This approach, however, is problematic, as the example of Maxus Energy's spinoff of Diamond Shamrock makes clear. Although the two companies are in different two-digit industries, they are certainly in related businesses: Maxus Energy is in petroleum exploration (SIC 1311), while Diamond Shamrock is in petroleum refining and marketing (SIC 2911).

Instead of using the two-digit approach, we use our own subjective assessment of whether the parent and spinoff are in related lines of business. This requires us to analyze the reported segments of both the spinoff and the parent as of year 0. In addition, we read annual reports, prospectuses and news articles to get a full understanding of the businesses of the spinoff and parent and to discern whether these businesses are related or unrelated. Using this procedure, we classify 90 spinoffs as unrelated to the parent and 70 as related. After presenting a series of results using this measure of relatedness, we analyze the robustness of our results to using the standard two-digit method.

II. Characteristics of the Sample

Table I lists the number of spinoffs in each year and the total market value of equity spun off in that year. Table II, Panels A through C, provide summary statistics on some of the key variables for the spinoffs and parents in years –1,0,+1. In year 0, a year which straddles both the pre and post-spinoff periods, spinoffs have mean (median) total sales of $601.3 ($253.1) and total assets of $569.7.3 ($211.5), denominated in millions of 1997 dollars. Mean earnings before interest, taxes, depreciation and amortization normalized by end-of-year assets (operating profit ratio) is 0.051. This is considerably less than the median of 0.117 because of a subset of companies with large operating losses. After subtracting the industry median, the industry adjusted operating income ratio is -0.066 (significant at the 1% level) while the median is -0.009 (significant at the 10% level).

Despite the fact that spinoffs have lower operating profit ratios than their industry peers, their Q at year 0 is not substantially different. The mean is a bit higher than the

industry value, the median is a bit lower, but neither difference is statistically significant. While *Q* is not significantly different, spinoffs do have higher leverage than the median firm in the industry. Mean (median) leverage (defined as book value of long term debt divided by book value of long term debt plus the market value of equity) for spinoffs in year 0 is 0.295 (0.255) which is 0.049 (0.029) greater than the industry median; both differences are statistically significant.[9]

The average ratio of capital expenditures to assets --- our measure of spinoff investment --- is 0.086 while the median is 0.057. The mean difference between spinoff investment and the median industry investment is 0.014, which is statistically significant, while the median is 0.004 which is not. The latter comparison is probably more meaningful given that the mean has some outliers. The bottom line from Table II, Panel A is that in the year of the transaction, spinoffs generate lower operating profit and have higher leverage than their industry peers, but their *Q* and capital expenditure rates are about the same.

Table II, Panel B summarizes the data on parent companies. They are considerably larger than the spinoffs with mean (median) sales of $2,846.1 ($1,115.2) and mean (median) assets of $3,817.9 ($978.9). In contrast to spinoffs, parents generate slightly higher operating profit than their industry peers, but the difference is not statistically significant. Parent companies have higher *Q* than the industry median; the mean difference is 0.329, while the median difference of 0.119, both of which are statistically significant.[10] Parents also have significantly higher leverage than the industry median. Despite higher *Q* ratios, parent investment rates are not significantly different than their industry peers. Thus, in the year of the transaction, parent companies

seem to have somewhat higher operating profits, *Q*, and leverage than the industry, but they do not invest at a higher rate.[11]

Finally, Panel C of Table II compares spinoffs and parents. In year 0, the median spinoff is about 25% of the hypothetical combined entity (spinoff and parent together). Spinoffs also have lower operating profit and *Q* than their parents by a statistically and economically significant amount. Spinoff leverage is moderately less than parent leverage. Spinoff mean investment rates are significantly higher than they are for parents, however, the median difference is not statistically significant. There are no significant differences in operating profit, investment, and Q of the industries in which parents and spinoffs operate.

A number of earlier studies have found positive excess returns in the period during which the spinoff is announced, ranging from 2.8% to 5.6% (Schipper and Smith (1983), Hite and Owers (1983), Rosenfeld (1984), Slovin, Sushka and Ferraro (1995) and Daley, Mehrotra and Sivakumar (1997).) In our sample, we find mean positive excess returns of 3.9% for the two-day period around the announcement. The median excess return is 2.23% and 68.9% of the observations are positive. Both excess returns are statistically significant. Daley, Mehrotra and Sivakumar (1997) and Desai and Jain (1999) show that announcement period returns are larger for unrelated spinoffs. In our sample, the mean announcement period return for unrelated spinoffs is 4.2% and the median is 2.3% , while for related spinoffs the mean is 3.3% and the median is 2.6%. These findings are similar in magnitude to the above studies, though the differences reported here are not statistically significant.

III. Investment Behavior Before and After the Spinoff

A. Baseline Results

One of the most basic predictions of investment theory is that firms with better investment opportunities should invest more. Empirically, this prediction usually takes the form of a *Q*-based model of investment in which normalized capital expenditures are regressed on *Q*. Thus, one way to determine whether spinoffs change investment behavior is to examine whether there are changes in the sensitivity of investment to *Q* for spinoff firms before and after the spinoff. We estimate the following model for years -3,-2,-1, +1,+2,+3, excluding the year of the spinoff because it includes both pre and post-spinoff periods:

$$I_{it} = \beta_{0i} + \beta_1 * Q_{it} + \beta_2 * Q_{it} * Before + \beta_3 * Before + \Sigma_t \gamma_t * Year_t + \varepsilon_{it}. \quad (1)$$

In equation (1), I_{it} is the ratio of capital expenditures to assets of firm *i* in period *t*. Firm fixed effects are captured in the firm-specific intercept term β_{0i}. *Before* is a dummy variable taking the value 1 in years -1, -2, and –3 and zero otherwise. Ideally, a firm-specific measure of *Q* should be used as a proxy for a firm's investment opportunity. However, because spinoffs are not publicly traded prior to year 0, we cannot observe the pre-spinoff market value of the firm so a firm-specific measure of *Q* is unavailable. Instead, our measure of *Q for both the pre and post-spinoff periods* is the median asset-weighted *Q* of stand-alone firms in the spinoff's industries. Although a firm-specific measure of *Q can* be calculated in the post-spinoff period, using it as our post-spinoff proxy for investment opportunity could bias our results if firm-specific *Q* is more (or

less) informative about investment opportunity than is industry Q.[12] To minimize the effects of possible mid-year changes in business composition and investment opportunities, we take an average of Q in years t and $t-1$; none of the results depend critically on averaging in this way. $Year_t$ is a calendar year dummy.

Because other studies have found that cash flow, in addition to Q, explains capital expenditures (see, e.g., Fazzari, Hubbard and Petersen (1988)), we also estimate equation (1) in an augmented form:

$$I_{it} = \beta_{0i} + \beta_1 * Q + \beta_2 * Q * Before + \beta_3 * Before + \beta_4 * SOP_{it} \qquad (2)$$
$$+ \beta_5 * SOP_{it} * Before + \beta_6 * POP_{it} * Before + \Sigma_t \gamma_t * Year_t + \varepsilon_{it}$$

where SOP_{it} and POP_{it} are the asset-normalized operating profit of the spinoff and parent, respectively.

If investment spending in conglomerates is distorted in some way, then one would expect the spinoff's investment to be less sensitive to Q when it is part of the conglomerate than when it is an independent entity. That is, one would predict: $\beta_1>0$ and $\beta_2<0$ in equations (1) and (2). It is less clear how distortions in internal capital markets would change the relationship between investment and operating profit. However, if firms are financially constrained, one might expect a spinoff's operating profit to have a bigger effect on investment after it is spun off. When it is part of the conglomerate, the parent's operating profits should have a bigger effect on the spinoff's investment. Empirically, this implies $\beta_4>0$, $\beta_5<0$ and $\beta_6>0$.

The first column of Table III reports the results of estimating equation (1) for the entire sample. The estimate for the *Q* coefficient, β_1, is positive and statistically significant; after the spinoff, investment is positively related to industry *Q*. The coefficient estimate for the interaction term, β_2, is negative. These coefficient estimates suggest that the firm's pre-spinoff sensitivity of investment to *Q* is about half that of its post-spinoff level. However, the point estimate of the interaction coefficient is statistically insignificant with a p-value of 0.150.

The second column of Table III reports the results of estimating equation (2), the investment model including spinoff and parent operating profit. We observe the same pattern of *Q* coefficients, except that now the coefficient of the interaction term is statistically significant. The regression results also indicate that spinoff investment is sensitive to its own operating profit after the spinoff, but not before the spinoff. Instead, before the spinoff, *parent* operating profit is positively related to the division's investment. This finding is consistent with the view that, after the spinoff, firms are financially constrained by their own operating profit, but before the spinoff they are constrained by the parent's operating profit. Despite the increased sensitivity of spinoff investment to own operating profit, the spinoff appears to be more responsive to investment opportunities after the spinoff has occurred. To the extent that operating profit proxies for investment opportunities, the increased sensitivity to the spinoff's own operating profit is also consistent with the firm's investment moving more in line with investment opportunities.

To get a sense of the magnitude of the difference in the sensitivity of investment to *Q* before and after the spinoff, consider the following calculations. The average of the

industry *Q* values is 1.41. The within-firm, time-series standard deviation of industry *Q* is 0.215. Thus, using the estimates from the second column of Table III, before a spinoff, a one standard deviation increase in industry Q from its mean of 1.41 to 1.62 would be predicted to increase normalized investment by 0.0017. Evaluated at the mean investment rate of 0.082, the model predicts an increase to 0.084, a small effect. After the spinoff, the effects of an increase in *Q* are larger. A one standard deviation increase in industry *Q* increases normalized investment by .0056, which (at the mean investment level) amounts to an increase in the rate of investment to 0.088. In this case, a 14.9% increase in industry *Q*, results in a 7.3% increase in the investment rate, an implied elasticity of almost 50%.

B. Related Versus Unrelated Spinoffs

Table IV reports the result of estimating equations (1) and (2) after breaking out the sample into two sub-samples based on whether the spinoff's industry is related to the parent's. There are two reasons to examine spinoffs of unrelated divisions separately. First, it has been argued that conglomerates comprised of unrelated businesses have been the least successful conglomerates (see, e.g., Berger and Ofek (1995)). If distortions in investment spending contribute to the conglomerate discount, then it seems likely that we should find greater evidence of investment distortions in the unrelated subsample of spinoffs. Second, on a more practical level, industry *Q* --- our proxy for divisional investment opportunity --- may be a more appropriate measure of investment opportunity for unrelated divisions where there are no significant operating synergies with the rest of the company. For example, a paper manufacturer that is part of a conglomerate with a

lumber division may have different investment opportunities than a stand-alone paper manufacturer. Since the stand-alone paper manufacturers that form the basis of our industry *Q* measure do not own lumber companies, there may be more measurement error in the *Q* estimates for the paper manufacturers operating alongside related divisions.

The results reported in the first and second columns indicate that when an unrelated firm is spun off, there is a statistically significant increase in the sensitivity of investment to industry *Q*. The same is not true for spinoffs of related businesses. As the third and fourth columns of Table IV indicate, investment is insensitive to industry *Q* after the spinoff. If anything, investment is more sensitive to *Q before* the spinoff for firms in industries related to the parent. We have no clear explanation of this finding.

The estimated coefficients from the regressions for unrelated spinoffs suggest a larger effect of the spinoff on the investment-*Q* sensitivity. Using the regression estimates from the augmented specification (second column of Table IV), a one standard deviation increase in industry *Q* (using the average industry *Q* value of 1.41 and the within-firm standard deviation of 0.228), implies a post-spinoff increase in the investment rate of .0098. Evaluated at the means for unrelated firms, investment would be predicted to increase from 0.087 to 0.097, an increase of 11.5%. This amounts to an implied elasticity of 71%. By contrast, the pre-spinoff sensitivity is essentially zero.

C. High Versus Low Announcement Period Returns

Table V breaks out the sample based on the parent company's excess returns at the announcement of the spinoff. As discussed in section II, mean and median excess returns are positive, but there is considerable heterogeneity across firms. Announcement

period returns reflect the cumulative response to many factors and are thus a noisy signal regarding the perceived benefits of the spinoff. However, if the stock market reacts favorably to the dismantling of an inefficient internal capital market, then we would expect spinoffs associated with large positive announcement effects to exhibit an increase in the post-spinoff sensitivity of investment to industry *Q*.

The first column of Table V shows that spinoffs with announcement effects above the median of 2.23%, exhibit an increase in the sensitivity of investment to *Q*. Similar results hold for the estimation of equation (2). The third and fourth columns of Table V show that for firms with an announcement effect below the median, spinoff investment is insensitive to industry *Q* both before and after the spinoff.

It should be noted that the announcement effect sample split does not proxy for the relatedness sample split. Of the 90 unrelated spinoffs, 44 have announcement period returns greater than the median value, while of the 70 related spinoffs, 36 have announcement-period returns greater than the median.[13] Our findings (not reported in tables) indicate that within both the related and unrelated subsamples, the spinoffs with larger announcement effects exhibit greater increases in the sensitivity of investment to *Q*, both in terms of the magnitude and the significance of the estimated post-spinoff *Q* coefficients.

D. Changes in the Rate of Investment

If, as some theories predict, conglomerate divisions over-invest in low *Q* industries and under-invest in high *Q* industries, we would expect to see a drop in investment for spinoffs in low *Q* industries and an increase in investment for spinoffs in

high *Q* industries following the separation. To address this implication, we start by calculating the average industry-adjusted investment rate in the three years before the spinoff and the average for the three years after the spinoff.[14] The change is a measure of whether firms increase investment relative to industry peers or cut investment relative to industry peers. The mean change, –0.0004, is close to zero and statistically insignificant. The average change in industry-adjusted investment, however, masks considerable variation across firms in their response to the spinoff.

The first column of Table VI, Panel A presents the results of a regression of the change in average industry-adjusted investment on industry *Q*. Because we do not want to use information in *Q* that evolves during the period to explain changes in investment during the period, we use industry *Q* three years before the spinoff as our proxy for whether the firm is in a low *Q* or high *Q* industry. The coefficient of *Q* is positive and the intercept is negative, indicating that spinoff firms tend to increase investment in high *Q* industries and cut investment in low *Q* industries. Neither point estimate is statistically significant, however.

The first column of Table VI, Panel B takes a non-parametric approach to the same question. Of the 100 firms in industries with *Q* below the mean (1.37) three years before the spinoff, 53 experience a reduction in average industry-adjusted investment rates, statistically indistinguishable from a coin flip. By contrast, of the 55 firms with industry *Q* above the mean, 37 experience an increase in their industry adjusted investment rates, which using a one-sided sign test is statistically significant.

The next columns split the sample by whether the spinoff is in an industry related to the parent. Here the results are stronger both in the regression framework and the non-

parametric approach. The second column of the table reports the results for the spinoffs that are unrelated to the parent. The coefficient of industry *Q* is positive and statistically significant. The estimates imply that for industry *Q* greater than 1.64, industry-adjusted investment rises and for industry *Q* below this point, it falls. Likewise, in the non-parametric analysis, 34 of the 54 firms with industry *Q* below the mean experience a reduction in their industry-adjusted investment and 24 out of 32 firms in high *Q* industries experience an increase in their industry-adjusted investment. As the third column of Table VI indicates, there are no statistically significant relationships between Q and investment changes for the sub-sample of related spinoffs. These findings are consistent with our fixed effects model in which we found that the increase in the sensitivity of investment to industry Q was restricted to the sample of unrelated spinoffs.

Finally, the last two columns of Table VI report the results for the sample based on whether the announcement period returns are above or below the median. The regression results in Panel A show there is a positive and statistically significant relationship between the change in industry-adjusted investment and industry *Q* for high announcement effect spinoffs. 31 of the 55 firms in low *Q* industries experience a reduction in their industry-adjusted investment rates, however, this is insignificantly different from a coin toss. By contrast, 21 of the 28 firms in high Q industries increase their industry-adjusted investment rates; this is statistically significant. In the sub-sample of firms with low announcement-period returns, the change in investment rates is hard to distinguish from zero and bears no relation to *Q*. These results are all consistent with our earlier finding in Table V that firms with high announcement-period returns exhibit an increased sensitivity of investment to industry *Q*.

E. Alternative Measures of Investment Opportunity

Thus far, we have relied on industry median *Q* as a measure of investment opportunity because we cannot measure actual firm *Q* prior to the spinoff. While this clearly measures investment opportunities with error, we argued that as long as this measurement error is the same before and after the spinoff, it is unlikely to be what is driving our results. Nevertheless, it is useful to see whether our results are robust to using other proxies for investment opportunities. One alternative is to use the investment rates of other stand-alone firms in the industry as a proxy for investment opportunities: if other firms are making significant investments, it is arguably because investment opportunities are good in the industry. This would suggest estimating the following regression equation:

$$I_{it} = \delta_{0i} + \delta_1 * INDI_{it} + \delta_2 * INDI_{it} * Before + \delta_3 * Before + \Sigma_t \gamma_t * Year_t + \varepsilon_{it,} \qquad (3)$$

where I_{it} is again the spinoff's investment-to-assets ratio and $INDI_{it}$ is the weighted average (again using segment assets as weights) of median investment-to-assets ratios for stand-alone firms in the various industries of spinoff firm *i* at time *t*.

One drawback of this approach is that there may be other factors that drive stand-alone investment besides investment opportunities. For example, it is possible that stand-alone firms are more liquidity constrained than conglomerate divisions. Showing that spinoffs act more like liquidity constrained stand-alone firms does not prove that their investment is more sensitive to investment opportunities; it may only prove that they too are liquidity constrained once they are spun off.

The findings reported in Table VII are generally consistent with our previous results indicating that investment is less sensitive to investment opportunities before the spinoff. The first column shows the results of estimating this equation for the full sample. The estimated coefficient of industry investment is positive and statistically significant. More importantly, the coefficient of the interaction term is negative, with a p-value of 0.052. Thus, it appears that spinoff firm investment is more sensitive to industry investment after the spinoff than it is before the spinoff.

The second column shows the coefficient estimates for the sample of unrelated spinoffs. The results mirror those for the sample as a whole. Finally, the third column shows the results for related spinoffs, where we find the same pattern of coefficients. Here, however, the coefficient of the interaction term is statistically insignificant. Note that when we used industry *Q* as the proxy for investment opportunities we found that investment by related spinoffs was *more* sensitive to investment prior to the spinoff --- a somewhat puzzling finding. These results suggest that this particular finding is not robust to alternative measures of investment opportunities.

The last two columns break out the results based on the magnitude of the announcement-period return. For high announcement-effect firms, the coefficients have the predicted sign and are statistically significant. For spinoffs with low announcement-period returns, the coefficients also indicate an increased sensitivity of investment to investment opportunities after the spinoff, but the coefficients are not statistically significant. Regressions not reported in the table indicate that unrelated spinoffs with high announcement-period returns exhibit the greatest increase in the sensitivity of spinoff investment to median industry investment. Including measures of spinoff and

parent operating profit in the regressions has no appreciable impact on the estimated coefficients of δ_1 and δ_2.

IV. Robustness of the Results

In this section we investigate whether our results reflect a genuine change in investment behavior or are simply the result of spurious correlation driven by various types of mismeasurement. In particular, we consider three issues: (a) the appropriateness of our industry benchmarks particularly before the spinoff; (b) our measure of relatedness; (c) whether spinoffs are becoming more like their industry benchmarks on all dimensions, not just on capital expenditures.

A. Pre-Spinoff Industry Benchmarks

While initial post-spinoff annual reports contain detailed financial information on the company before the spinoff, they often do not contain detailed segment data. Because spinoffs sometimes operate in multiple segments, we have made some assumptions about the pre-spinoff industry segments in order to construct our pre-spinoff industry Q and industry investment measures. Our approach has been to use the closest available segment data to determine pre-spinoff industry weights. To the extent that these weights are less accurate than the post-spinoff weights, our industry measures prior to the spinoff will be subject to more measurement error than the post-spinoff industry measures. This biases the estimated pre-spinoff sensitivity of investment to Q or industry investment towards zero. If this is the case, our results might be driven more by measurement error than by a change in investment behavior.

To see whether this could explain our results, we separately analyze the spinoffs that operate in only one segment at the time of the spinoff. While it is possible that the firm operates in more than one segment prior to the spinoff, it seems unlikely that the pro forma data in the first annual report would reflect anything other than the single post-spinoff segment.

The first column of Table VIII repeats the estimation of equation (1) for unrelated spinoffs that operate in only one segment. There are 57 such firms. The coefficient estimates are essentially the same as the estimates for the full set of unrelated spinoffs. Therefore, it seems unlikely that our basic results are driven by inadequate segment information prior to the spinoff.

B. Measure of Relatedness

As discussed above, it is typical to say that two businesses are unrelated if they operate in different two-digit SIC codes. We have taken a different approach because businesses in different two-digit SIC codes can actually be related. The case of Maxus Energy mentioned previously is one example where the two-digit approach leads to a misleading conclusion about relatedness. Our approach has been to use a subjective assessment of whether two businesses are related. Because we focus much of our analysis on the unrelated spinoffs, it is natural to ask whether our classification scheme is appropriate. Are our results driven by our use of this scheme rather than the traditional two-digit method?

In an effort to address this question, we classify firms based on the two-digit method. The spinoff is considered to be related to the parent, if in year 0, the spinoff has

a segment with the same two-digit SIC code as one of the parent's segments. This approach classifies 70 spinoffs as related and 90 spinoffs as unrelated. Of the 90 unrelated spinoffs according to the two-digit method, 67 (74%) are also classified as unrelated using our method. Of the 70 related spinoffs according to the 2-digit method, 47 (67%) are classified as related according to our method.

As an example of where the two methods disagree, consider the spinoff of the Promus Companies which created two independent firms, Promus Hotel Corp which operates hotels, and Harrah's Entertainment which operates casino hotels. The two-digit method classifies them as unrelated because they are in different two-digit SIC codes, while we classify them as related on the grounds that they both operate hotels (although admittedly, different types of hotels). On the flip-side, we classify Earthgrains (which makes bread) as unrelated to its parent, Anheuser-Busch (which makes beer), while the two-digit method considers them related. It's possible to argue that these businesses are related in that they both supply retail grocers and use grain as an input, but we classify them as unrelated in our subjective scheme because the production technology and the final products are quite different. The important point that these examples illustrate is that all businesses are related in some way, but they differ in the extent to which they are related. Both classification schemes rely on implicit judgement about the extent to which businesses are related. Thus, it would be useful to know whether our results are driven by the judgements implicit in both schemes.

The second column of Table VIII reports the results for unrelated spinoffs based on the two-digit method. The results indicate that with this method, unrelated spinoffs also exhibit increased sensitivity of investment to industry Q after the spinoff. The third

column shows the results for the 67 firms where the two methods agree in their classification of unrelated firms. The coefficient estimates are larger in absolute value and in significance than in the second column. We cannot say which classification method is better --- both clearly have flaws --- but we can say that our results are not driven by our particular classification scheme.

C. Are Spinoffs Changing On Other Dimensions As Well?

Another method of addressing the measurement error issue is to ask whether the spinoff firm becomes more like the median industry firm on other dimensions besides capital expenditures. If measurement error in the pre-spinoff period is the source of our investment results, then we would expect this measurement error effect to carry over to other variables as well. Conversely, if measurement error is not significantly greater in the pre-spinoff period, then other characteristics of the spinoff firm will likely show the same relationship to median industry values in both the pre and post-spinoff periods. Thus, we analyze changes in the sensitivity of spinoff operating profit to median industry operating profit before and after the spinoff.

Table IX presents regression results using equation (3), with the exception that investment has been replaced with operating profit for both the spinoff and the industry. In order to maintain comparability with the investment regressions, observations are included only if there is valid data for the investment regressions, i.e. the observation was included in the prior investment analyses. In addition, observations where spinoff operating profit is greater than the 99^{th} percentile for the sample or less than the 1^{st} percentile are excluded to limit the impact of some large outliers.

For the full sample we see that spinoff operating profit is positively related to industry operating profit for both the pre and post-spinoff period. The coefficient for industry operating profit is 0.828 with a p-value of 0.004, while the coefficient of the interaction term is –0.067 with a statistically insignificant p-value of 0.766. As can be seen from the other columns of Table IX, similar results are found for the unrelated and related spinoff subsamples**.** We conclude, therefore, that our results relating spinoff firm investment to proxies for investment opportunity do not reflect that spinoff firms are simply becoming more like the median industry firm as they mature. Nor are our results attributable to measurement error in our calculation of industry *Q* or industry investment. Rather, the post-spinoff increase in the sensitivity of investment to proxies for investment opportunity reflects real changes in operating policies.

V. Conclusion

This paper documents the change in investment behavior that occurs after a spinoff. We find that spinoff investment moves more closely in line with median industry Tobin's *Q* and median industry investment after the spinoff. This effect is particularly pronounced in spinoffs of unrelated divisions and in spinoffs in which the stock market reacts favorably to the announcement of the spinoff. We also find that spinoffs of unrelated firms and those with high announcement-period returns tend to cut industry-adjusted investment after the spinoff in low *Q* industries and increase industry-adjusted investment in high *Q* industries.

What do the results say about the efficiency of the internal capital markets of the firms in our sample? One might argue that they do not tell us very much. One

interpretation of the results is that stand-alone investment and *Q* move in tandem not because *Q* proxies for investment opportunities, but because *Q* is related to the ability (or willingness) of firms to obtain external finance. We know, for example, that a firm is more prone to issue equity when its stock price (and hence *Q*) is high (see, e.g., Jung, Kim and Stulz (1996)). Thus, the increased sensitivity of investment to *Q* after the spinoff, could be a sign of an increase in liquidity constraints, not of an increased desire to invest only when investment opportunities are attractive.

There are two reasons to believe that this is unlikely to explain our findings. First, although firms do raise more equity when their stock prices rise, equity is a very small source of financing and is unlikely to have an appreciable effect on investment. There is also little evidence that firms seek more debt financing when their stock prices rise. The second and more important reason to be skeptical of this interpretation is that we find that the effects are more pronounced when the stock market reacts favorably to the announcement of the spinoffs. If investors believed that the spinoff would constrain the ability of firms to invest, then it's unlikely the stock price would have risen. Our findings suggest instead that the replacement of an internal capital market for an external capital market better aligns the spinoff firm's investment with its investment opportunities. This in turn points to the inefficiency of pre-spinoff internal capital markets in the sample of firms we study.

Precisely why spinoffs are associated with an increased sensitivity of investment to investment opportunity is not completely clear. Is it because there is less cross-subsidization across business units? Is it because managers have higher-powered incentives in the independent firm? Or is it because managers get more precise signals

from the stock market about performance and investment opportunities? Answering these questions is important, but will remain a challenge for future research.

References

Alchian, Armen, "Corporate Management and Property Rights," in Henry Manne, ed., *Economic Policy and the Regulation of Corporate Securities*, Washington, DC: American Enterprise Institute, 1969.

Berger, Philip G. and Eli Ofek, 1995, "Diversification's Effect on Firm Value," *Journal of Financial Economics*, 37, 39-65.

Coase, Ronald, 1937, "The Nature of the Firm," *Economica*, 4, 386-405.

Comment, Robert and Gregg Jarrell, 1995, "Corporate Focus and Stock Returns," *Journal of Financial Economics* 37, 67-87.

Cusatis, Patrick, James A. Miles, and J. Randall Woolridge, 1993, "Value Creation Through Spin-offs: the Stock Market Evidence," *Journal of Financial Economics* 33, 293-311.

Daley, Lane, Vikas Mehrotra and Ranjini Sivakumar, 1997, "Corporate Focus and Value Creation: Evidence from Spin-offs," *Journal of Financial Economics*, 45, 257-281.

Denis, David J and Bharathram Thothadri, 1999, "Internal Capital Markets, Growth Opportunities, and the Valuation Effects of Corporate Diversification," Purdue University working paper.

Desai, H. and P.C. Jain, 1999 "Firm Performance and Focus: Long_run Stock Market Performance Following Spinoffs," *Journal of Financial Economics*, 54, 75-101

Dittmar, Amy, 2000, "Capital Structure in Corporate Spinoffs," Indiana University, working paper.

Dittmar, Amy and Anil Shivdasani, 2000, "Divestitures and Divisional Investment Policies," Indiana University, working paper.

Fazzari, Stephen M., R. Glenn Hubbard and Bruce C. Petersen, 1988, "Financing Constraints and Corporate Investment", *Brookings Papers* v19(1), 141-195.

Gertner, Robert, David Scharfstein and Jeremy Stein, 1994, "Internal Versus External Capital Markets," *Quarterly Journal of Economics*, 109, 1211-1230.

Gilson, Stuart, Paul Healy, Christopher Noe and Krishna Palepu, 2000, "Analyst Specialization and Conglomerate Stock Break-ups," Harvard University, working paper.

Hite, Gailen L. and James E. Owers, 1983, "Security Price Reactions around Corporate Spin-off Announcements," *Journal of Financial Economics* 12, 409-436.

Jung, Kooyul, Yong-Cheol Kim and Ren■ M. Stulz, 1996, Timing, investment opportunities, managerial discretion and the security issued decision, *Journal of Financial Economics*, 42, 159-185.

Krishnaswami, Sudha and Venkat Subramanian, 1999, "Information Asymmetry, Valuation, and the Corporate Spin-off Decision," *Journal of Financial Economics* 53, 73-112.

Lamont, Owen, 1997, "Cash flow and Investment: Evidence from Internal Capital Markets," *Journal of Finance*, 52, 83-109.

Lang, Larry and Rene Stulz, 1994, "Tobin's Q, Corporate Diversification and Firm Performance," *Journal of Political Economy* 102, 1248-1280.

MacKie-Mason, Jeffrey, "Do Firms Care Who Provides Their Financing?" in R. Glenn Hubbard, ed., *Asymmetric Information , Corporate Finance, and Investment* (Chicago, IL: University of Chicago), 63-103.

Matsusaka, John G. and Vikram Nanda, 1997, "Internal Capital Markets and Corporate Refocusing," University of Southern California, working paper.

Meyer, Margaret, Paul Milgrom, and John Roberts, "Organizational Prospects, Influence Costs, and Ownership Changes," *Journal of Economics Management and Strategy*, 1, 9-35.

Miles, James and James Rosenfeld, 1983, "An Empirical Analysis of the Effects of Spinoff Announcements on Shareholder Wealth," *Journal of Finance*, 38, 1597-1606.

Parrino, Robert, 1997, "Spinoffs and Wealth Transfers: The Marriott Case," *Journal of Financial Economics*, 43, 241-274.

Perfect, Steven and Kenneth Wiles, 1994, "Alternative Constructions of Tobin's q: An Empirical Comparison," *Journal of Empirical Finance*, 1, 313-341.

Powers, Eric, 2001, "Spinoffs, Selloffs, and Equity Carvouts: An Analysis of Divestiture Method Choice," University of South Carolina, working paper.

Rajan, Raghuram, Henri Servaes and Luigi Zingales, 2000, "The Cost of Diversity: the Diversification Discount and Inefficient Investment," *Journal of Finance* 55, 35-80.

Rosenfeld, James J., 1984, "Additional Evidence on the Relationship Between Divestiture Announcements and Shareholder Wealth," *Journal of Finance* 39, 1437-1448.

Scharfstein, David, 1998, "Evidence on the Dark Side of Internal Capital Markets," National Bureau of Economic Research, Working Paper No. 6352.

Scharfstein, David and Jeremy Stein, 1998, "The Dark Side of Internal Capital Markets: Divisional Rent-Seeking and Inefficient Investment," National Bureau of Economic Research, Working Paper No. 5969.

Schipper, Katherine and Abbie Smith, 1983, "Effects of Recontracting on Shareholder Wealth: the Case of Voluntary Spin-offs," *Journal of Financial Economics*, 12, 437-467.

Schlingemann, Frederick, Rene Stulz, and Ralph A. Walkling, 1999 "Corporate Focusing and Internal Capital Markets," National Bureau of Economic Research, Working Paper No. W7175.

Shin, Hyun Han and Rene Stulz, 1998, "Are Internal Capital Markets Efficient?" *Quarterly Journal of Economics*, 113, 531-552.

Slovin, Myron B. Marie E. Sushka and Steven R. Ferraro, 1995, "A Comparison of the Information Conveyed by Equity Carve-outs, Spin-offs, and Asset Sell-offs," *Journal of Financial Economics*, 37, 89-104.

Smith, Clifford and Ross Watts, 1992, "The Investment Opportunity Set and Corporate Financing, Dividend and Compensation Policies," *Journal of Financial Economics,* 32, 263-292.

Stein, Jeremy C., 1997, "Internal Capital Markets and the Competition for Corporate Resources," *Journal of Finance*, 52, 111-133.

Williamson, Oliver, *Corporate Control and Business Behavior*, New Jersey: Prentice Hall, 1970.

Woo, Carolyn, Gary Willard, and Stephen Beckstead, 1989, "Spin-Offs: What are the Gains?" *Journal of Business Strategy*, March-April, 29-32.

Wulf, Julie, 1997, "Influence and Inefficiency in the Internal Capital Market: Theory and Evidence," Columbia University working paper.

Table I
Number of Spinoffs and Total Market Value per Year

This table lists the number of spinoffs in each year in our sample and the market value of the spinoff on the first day of trading denominated in millions of 1997 dollars. See Section 2 of the paper for details on the criteria for inclusion in the spinoff sample.

Year	Number	Market Value (Million 1997 $)
1982	1	66
1983	3	1,714
1984	7	2,920
1985	12	3,681
1986	10	9,200
1987	13	6,124
1988	17	9,045
1989	18	7,308
1990	10	4,654
1991	8	4,375
1992	12	7,568
1993	19	21,774
1994	16	14,284
1995	10	7,935
1996	4	1,605
All years	160	102,260

Table II, Panel A
Characteristics of Spinoff Firms in Year –1, 0, +1

This table provides summary statistics on the sample of 160 spinoffs. Year 0 is the fiscal year during which the spinoff occurred. Operating Profit Ratio is Earnings before Interest, Taxes and Depreciation divided by Total Assets. *Q* is the spinoff's (Market Value of Common Equity - Book Value of Equity + Total Assets - Deferred Taxes)/Total Assets. Investment Ratio is Capital Expenditures/Total Assets. Leverage is (Long Term Debt + Current Portion of Long Term Debt)/(Long Term Debt + Current Portion of Long Term Debt + Market Value of Common Equity + Liquidation Value of Preferred). Median industry values are subtracted from Operating Profit Ratio, Q and Investment Ratio to generate the respective Industry Adjusted variables. Upper value in each sell is the mean, the lower value in parentheses is the median. Significance of industry adjusted differences is measured using both a t-statistic and a sign test. Asterisks next to mean and median values denote the significance level of each test. *** indicates significance at 1% level; ** indicates significance at 5% level; and * indicates significance at 10% level.

Spinoff Characteristics	Year -1	Year 0	Year +1
Sales (1997 millions of dollars)	590.5 (239.7)	601.3 (253.1)	630.4 (263.5)
Assets (1997 millions of dollars)	568.4 (189.6)	569.7 (211.5)	589.0 (197.5)
Operating Profit Ratio	0.061 (0.115)	0.051 (0.117)	0.073 (0.121)
Industry-Adjusted Operating Profit Ratio	-0.059*** (-0.014)	-0.066*** (-0.009)*	-0.041** (-0.008)
Q		1.584 (1.291)	1.643 (1.285)
Industry-Adjusted *Q*		0.150 (-0.041)	0.232** (-0.011)
Leverage		0.295 (0.255)	0.301 (0.267)
Industry-Adjusted Leverage		0.049** (0.029)*	0.039** (-0.001)
Investment Ratio	0.086 (0.052)	0.086 (0.057)	0.076 (0.058)
Industry-Adjusted Investment Ratio	0.013 (-0.004)	0.014** (0.004)	0.011 (0.002)
Number of Obs. For Investment Ratio	158	156	156

Table II, Panel B
Characteristics of Parent Firms in Year –1, 0, +1

This table provides summary statistics on the sample of spinoff parents. Year 0 is the fiscal year during which the spinoff occurred. Operating Profit Ratio is Earnings before Interest, Taxes and Depreciation divided by Total Assets. *Q* is the spinoff's (Market Value of Common Equity - Book Value of Equity + Total Assets - Deferred Taxes)/Total Assets. Investment Ratio is Capital Expenditures/Total Assets. Leverage is (Long Term Debt + Current Portion of Long Term Debt)/(Long Term Debt + Current Portion of Long Term Debt + Market Value of Common Equity + Liquidation Value of Preferred). Median industry values are subtracted from Operating Profit Ratio, Q and Investment Ratio to generate the respective Industry Adjusted variables. Upper value in each cell is the mean, the lower value in parentheses is the median. Significance of industry adjusted differences is measured using both a t-statistic and a sign test. Asterisks next to mean and median values denote the significance level of each test. *** indicates significance at 1% level; ** indicates significance at 5% level; and * indicates significance at 10% level.

Parent Characteristics	Year -1	Year 0	Year +1
Sales (1997 millions of dollars)	3054.8 (1259.0)	2846.1 (1115.2)	2855.1 (1134.8)
Assets (1997 millions of dollars)	4290.0 (1330.2)	3817.9 (978.9)	3853.5 (1144.0)
Operating Profit Ratio	0.135 (0.140)	0.136 (0.145)	0.144 (0.142)
Industry-Adjusted Operating Profit Ratio	0.015* (0.004)	0.015 (0.004)	0.029*** (0.021)**
Q	1.573 (1.347)	1.756 (1.471)	1.751 (1.480)
Industry-Adjusted *Q*	0.147*** (0.037)***	0.329*** (0.119)**	0.344*** (0.136)***
Leverage	0.321 (0.282)	0.323 (0.252)	0.323 (0.257)
Industry-Adjusted Leverage	0.050*** (0.046)***	0.059*** (0.054)***	0.044** (0.025)*
Investment Ratio	0.068 (0.052)	0.067 (0.053)	0.064 (0.048)
Industry-Adjusted Investment Ratio	0.005 (0.002)	0.003 (0.000)	0.006 (-0.001)
Number of Obs. For Investment Ratio	157	149	139

Table II, Panel C
Comparison of Spinoff and Parent Firms in Year –1, 0, +1

This table compares parents and spinoffs. The definitions of the variables can be deduced from the description of Table II, Panels A and B. Upper value in each cell is the mean, the lower value in parentheses is the median. Significance of differences is measured using both a t-statistic and a sign test. Asterisks next to mean and median values denote the significance level of each test. *** indicates significance at 1% level; ** indicates significance at 5% level; and * indicates significance at 10% level.

Spinoff vs. Parent in year 0	Year -1	Year 0	Year +1
Spinoff Sales/(Spinoff Sales + Parent Sales)	0.267 (0.211)	0.258 (0.214)	0.216 (0.256)
Spinoff Assets/(Spinoff Assets + Parent Assets)	0.225 (0.193)	0.238 (0.195)	0.232 (0.192)
Spinoff Operating profit Ratio - Parent Operating profit Ratio	-0.071*** (-0.021)	-0.078*** (-0.045)**	-0.065*** (-0.023)
Spinoff Industry Operating profit Ratio - Parent Industry Operating profit Ratio	0.000 (0.000)	-0.001 (0.000)	0.005 (0.003)
Spinoff *Q* - Parent *Q*		-0.199 (-0.224)***	-0.070 (-0.200)*
Spinoff Industry *Q* – Parent Industry *Q*	-0.028 (0.000)	0.006 (0.000)	0.001 (0.000)
Spinoff Leverage – Parent Leverage		-0.036 (-0.016)	-0.032 (-0.014)
Spinoff Industry Leverage – Parent Industry Leverage	-0.001 (0.000)	-0.007 (0.000)	-0.011 (0.000)
Spinoff Investment Ratio - Parent Investment Ratio	0.018** (0.007)*	0.021** (0.009)	0.012 (0.002)
Spinoff Industry Investment Ratio - Parent Industry Investment Ratio	-0.002 (0.000)	-0.003 (0.000)	0.000 (0.000)

Table III
The Sensitivity of Capital Expenditures
to Industry *Q* and Profitability Before and After Spinoff

This table reports the results of regression equation (1) and (2) as given in the text. The dependent variable is Capital Expenditures/Assets. Industry *Q* is the asset-weighted industry median *Q* of the industries in which the spinoff operates. Operating Profit Ratio is Earnings Before Interest Taxes and Depreciation divided by assets and is calculated for both the spinoff and the parent firm. Before takes the value 1 for years -3, -2, and -1 and takes the value 0 for years +1, +2, and +3. Year 0, the year of the spinoff, is excluded from the regression. The regressions include year dummy variables and firm fixed effects. The numbers in parentheses below the coefficient estimates are p-values. *** indicates significance at 1% level; ** indicates significance at 5% level; and * indicates significance at 10% level.

	Full Sample	
Industry *Q*		
	0.024**	0.026**
	(0.020)	(0.015)
Industry *Q* * Before	-0.012	-0.018**
	(0.150)	(0.038)
Before	0.026*	0.026
	(0.082)	(0.111)
Spinoff Operating Profit Ratio		0.033**
		(0.032)
Before*Spinoff Operating Profit Ratio		-0.045***
		(0.006)
Before* Parent Operating Profit Ratio		0.073
		(0.110)
No. of Firms	160	160
No. of Observations	769	746
R^2	0.044	.060

Table III

The Sensitivity of Capital Expenditures to Industry *Q* and Profitability Before and After Spinoff

This table reports the results of regression equation (1) and (2) as given in the text. The dependent variable is Capital Expenditures/Assets. Industry *Q* is the asset-weighted industry median *Q* of the industries in which the spinoff operates. Operating Profit Ratio is Earnings Before Interest Taxes and Depreciation divided by assets and is calculated for both the spinoff and the parent firm. Before takes the value 1 for years -3, -2, and -1 and takes the value 0 for years +1, +2, and +3. Year 0, the year of the spinoff, is excluded from the regression. The regressions include year dummy variables and firm fixed effects. The numbers in parentheses below the coefficient estimates are p-values. *** indicates significance at 1% level; ** indicates significance at 5% level; and * indicates significance at 10% level.

	Full Sample	
Industry *Q*	0.024**	0.026**
	(0.020)	(0.014)
Industry *Q* * Before	-0.012	-0.017**
	(0.150)	(0.047)
Before	0.026*	0.031*
	(0.082)	(0.057)
Spinoff Operating Profit Ratio		0.031**
		(0.039)
Before*Spinoff Operating Profit Ratio		-0.042***
		(0.010)
Before* Parent Operating profit Ratio		0.024
		(0.491)
No. of Firms	160	160
No. of Observations	769	746
R^2	0.044	.055

Table IV
The Sensitivity of Capital Expenditures
to Industry *Q* and Profitability Before and After Spinoff: Related Versus Unrelated Spinoffs

This table reports the results of regression equation (1) and (2) as given in the text. The sample is split according to whether the spinoff operates in industries that are related or unrelated to primary parent industries. This classification is based on the subjective assessment of the authors. The dependent variable is Capital Expenditures/Assets. Industry *Q* is the asset-weighted industry median *Q* of the industries in which the spinoff operates. Operating Profit Ratio is Earnings Before Interest Taxes and Depreciation divided by assets and is calculated for both the spinoff and the parent firm. Before takes the value 1 for years -3, -2, and -1 and takes the value 0 for years +1, +2, and +3. Year 0, the year of the spinoff, is excluded from the regression. The regressions include year dummy variables and firm fixed effects. The numbers in parentheses below the coefficient estimates are p-values. *** indicates significance at 1% level; ** indicates significance at 5% level; and * indicates significance at 10% level.

	Unrelated Spinoffs		Related Spinoffs	
Industry *Q*	0.039***	0.043***	0.015	0.015
	(0.004)	(0.002)	(0.367)	(0.368)
Industry *Q* * Before	-0.041***	-0.046***	0.030**	0.019
	(0.000)	(0.000)	(0.020)	(0.204)
Before	0.060***	0.051**	-0.026	-0.014
	(0.003)	(0.019)	(0.250)	(0.605)
Spinoff Operating Profit Ratio		0.023		-0.012
		(0.265)		(0.632)
Before*Spinoff Operating Profit Ratio		-0.022		-0.042*
		(0.381)		(0.081)
Before*Parent Operating Profit Ratio		0.122*		0.026
		(0.051)		(0.723)
No. of Firms	90	90	70	70
No. of Observations	436	424	333	322
R^2	0.129	0.143	0.090	0.102

Table IV

The Sensitivity of Capital Expenditures to Industry *Q* and Profitability Before and After Spinoff: Related Versus Unrelated Spinoffs

This table reports the results of regression equation (1) and (2) as given in the text. The sample is split according to whether the spinoff operates in industries that are related or unrelated to primary parent industries. This classification is based on the subjective assessment of the authors. The dependent variable is Capital Expenditures/Assets. Industry *Q* is the asset-weighted industry median *Q* of the industries in which the spinoff operates. Operating profit Ratio is Earnings Before Interest Taxes and Depreciation divided by assets and is calculated for both the spinoff and the parent firm. Before takes the value 1 for years -3, -2, and -1 and takes the value 0 for years +1, +2, and +3. Year 0, the year of the spinoff, is excluded from the regression. The regressions include year dummy variables and firm fixed effects. The numbers in parentheses below the coefficient estimates are p-values. *** indicates significance at 1% level; ** indicates significance at 5% level; and * indicates significance at 10% level.

	Unrelated Spinoffs		Related Spinoffs	
Industry *Q*	0.039***	0.043***	0.015	0.016
	(0.004)	(0.003)	(0.367)	(0.344)
Industry *Q* * Before	-0.041***	-0.045***	0.030**	0.018
	(0.000)	(0.000)	(0.020)	(0.217)
Before	0.060***	0.053**	-0.026	-0.008
	(0.003)	(0.015)	(0.250)	(0.757)
Spinoff Operating profit Ratio		0.022		0.012
		(0.296)		(0.637)
Before*Spinoff Operating profit Ratio		-0.016		-0.043*
		(0.509)		(0.077)
Before*Parent Operating profit Ratio		0.089*		-0.013
		(0.100)		(0.790)
No. of Firms	90	90	70	70
No. of Observations	436	424	333	322
R^2	0.129	0.140	0.090	0.102

Table V
The Sensitivity of Capital Expenditures
to Industry *Q* and Profitability Before and After Spinoff : Announcement Effects

This table reports the results of regression equation (1) and (2) as given in the text. High announcement effect spinoffs are those where two-day abnormal returns around the announcement are above the median of 0.0223. The dependent variable is Capital Expenditures/Assets. Industry *Q* is the asset-weighted industry median *Q* of the industries in which the spinoff operates. Operating profit Ratio is Earnings Before Interest Taxes and Depreciation divided by assets and is calculated for both the spinoff and the parent firm. Before takes the value 1 for years -3, -2, and -1 and takes the value for years +1, +2, and +3. Year 0, the year of the spinoff, is excluded from the regression. The regression includes year dummies and firm fixed effects. The numbers in parentheses below the coefficient estimates are p-values. *** indicates significance at 1% level; ** indicates significance at 5% level; and * indicates significance at 10% level.

	High Announcement Effect		Low Announcement Effect	
Industry *Q*	0.058***	0.056***	0.010	0.013
	(0.000)	(0.000)	(0.514)	(0.422)
Industry *Q* * Before	-0.034***	-0.033***	-0.002	-0.012
	(0.002)	(0.003)	(0.867)	(0.434)
Before	0.051***	0.051**	0.011	0.008
	(0.006)	(0.011)	(0.674)	(0.783)
Spinoff Operating Profit Ratio		0.010		0.029
		(0.672)		(0.182)
Before*Spinoff Operating Profit Ratio		-0.001		-0.051**
		(0.979)		(0.017)
Before* Parent Operating Profit Ratio		-0.032		0.133**
		(0.635)		(0.043)
No. of Firms	81	81	79	79
No. of Observations	396	384	373	362
R^2	0.106	0.113	0.067	0.102

Table V

The Sensitivity of Capital Expenditures to Industry *Q* and Profitability Before and After Spinoff : Announcement Effects

This table reports the results of regression equation (1) and (2) as given in the text. High announcement effect spinoffs are those where two-day abnormal returns around the announcement are above the median of 0.0223. The dependent variable is Capital Expenditures/Assets. Industry *Q* is the asset-weighted industry median *Q* of the industries in which the spinoff operates. Operating profit Ratio is Earnings Before Interest Taxes and Depreciation divided by assets and is calculated for both the spinoff and the parent firm. Before takes the value 1 for years -3, -2, and -1 and takes the value for years +1, +2, and +3. Year 0, the year of the spinoff, is excluded from the regression. The regression includes year dummies and firm fixed effects. The numbers in parentheses below the coefficient estimates are p-values. *** indicates significance at 1% level; ** indicates significance at 5% level; and * indicates significance at 10% level.

	High Announcement Effect		Low Announcement Effect	
Industry *Q*	0.058***	0.056***	0.010	0.013
	(0.000)	(0.000)	(0.514)	(0.422)
Industry *Q* * Before	-0.034***	-0.033***	-0.002	-0.013
	(0.002)	(0.003)	(0.867)	(0.411)
Before	0.051***	0.050**	0.011	0.016
	(0.006)	(0.013)	(0.674)	(0.571)
Spinoff Operating profit Ratio		0.011		0.028
		(0.643)		(0.199)
Before*Spinoff Operating profit Ratio		-0.004		-0.048**
		(0.979)		(0.026)
Before* Parent Operating profit Ratio		-0.012		0.073
		(0.789)		(0.207)
No. of Firms	81	81	79	79
No. of Observations	396	384	373	362
R^2	0.106	0.110	0.067	0.093

Table VI
Changes in the Industry-Adjusted Rate of Investment Before and After Spinoff

Panel A: Regression Results

The dependent variable in the regressions reported below is the change in the average industry-adjusted investment rate before (years –3,-2,-1) and after the spinoff (years +1,+2,+3). The industry adjusted investment rate is the spinoff firm's Capital Expenditures/Assets less the median Capital Expenditure/Assets ratio for the industry in which the firm operates. Industry Q in year –3 is the independent variable. Unrelated spinoffs are those that operate in industries that are unrelated to primary parent industries. This classification is based on the subjective assessment of the authors. High announcement effect spinoffs are those where the two-day abnormal returns around the announcement are above the median of 0.0223. The numbers in parentheses below the coefficient estimates are p-values. *** indicates significance at 1% level; ** indicates significance at 5% level; and * indicates significance at 10% level.

Panel B: Non-Parametric Results

The cells in this table report the number of instances in which the average industry adjusted investment rate rises or falls after the spinoff relative to before the spinoff. The industry adjusted investment rate is the spinoff firm's Capital Expenditures/Assets less the median Capital Expenditure/Assets ratio for the industry in which the firm operates. Low Q industries are those with industry Q less than 1.37 in year –3. Unrelated spinoffs are those in industries unrelated to the parent based on the authors' subjective assessments. High announcement effect spinoffs are those where the two-day abnormal returns around the announcement are above the median of 0.0223. The numbers in parentheses indicate the confidence levels of a Wilcoxon sined rank test. *** indicates significance at 1% level; and ** indicates significance at 5% level.

Panel A: Regression Results	Full Sample	Unrelated Spinoffs	Related Spinoffs	High Announcement Effect	Low Announcement Effect
Industry Q in Year –3	0.018 (0.144)	0.039** (0.014)	-0.015 (0.298)	0.038*** (0.000)	-0.004 (0.196)
Constant	-0.025 (0.177)	-0.063** (0.010)	0.032 (0.115)	-0.041** (0.011)	-0.111 (0.290)
No. of Firms/Obs. R^2	155 0.011	86 0.146	69 0.007	83 0.106	72 0.003
Panel B: Non-Parametric Results					
Low Q firms reducing industry-adjusted investment/All Low Q firms	53/100 (0.324)	34/54*** (0.009)	19/46 (0.164)	18/37 (0.512)	36/63 (0.494)
High Q firms reducing industry-adjusted investment/ All High Q Firms	37/54** (0.014)	24/31** (0.019)	13/23 (0.260)	19/25*** (0.002)	18/29 (0.552)

Table VII
The Sensitivity of Capital Expenditures
to Industry Capital Expenditures Before and After Spinoff:

This table reports the results of regression equation (3) in the paper in which the dependent variable is Capital Expenditures/Assets. Industry Capital Expenditures is the asset-weighted industry median capital expenditures of the industries in which the spinoff operates. Before takes the value 1 for years -3, -2, and -1 and takes the value for years +1, +2, and +3. Year 0, the year of the spinoff, is excluded from the regression. High announcement effect spinoffs are those where the two-day abnormal returns around the announcement are above the median of 0.0223. Unrelated spinoffs are identified based on the subjective assessment of the authors. The regression includes year dummies and firm fixed effects. The numbers in parentheses below the coefficient estimates are p-values. *** indicates significance at 1% level; ** indicates significance at 5% level; and * indicates significance at 10% level.

	Full Sample	Unrelated Spinoffs	Related Spinoffs	High Announcement Effect	Low Announcement Effect
Industry Investment Rate	0.312***	0.347***	0.392**	0.352**	0.258*
	(0.001)	(0.004)	(0.031)	(0.013)	(0.071)
Industry Investment Rate * Before	-0.195*	-0.294**	-0.173	-0.284**	-0.111
	(0.052)	(0.029)	(0.293)	(0.031)	(0.507)
Before	0.022*	0.023	0.022	0.029*	0.013
	(0.058)	(0.140)	(0.208)	(0.058)	(0.464)
No. of Firms	160	90	70	81	79
No. of Observations	769	436	333	396	373

Table VIII
Single-Segment Firms and SIC-Code Based Measure of Relatedness

This table reports the results of regression equation (1) in the paper in which the dependent variable is Capital Expenditures/Assets. Industry Q is the asset-weighted industry median Q of the industries in which the spinoff operates. Before takes the value 1 for years -3, -2, and -1 and takes the value for years +1, +2, and +3. Year 0, the year of the spinoff, is excluded from the regression. Unrelated spinoffs are identified based on the subjective assessment of the authors. Single Segment identifies those spinoffs that report data for only one segment in the years prior to the spinoff. Unrelated Spinoffs based on the 2-digit SIC code are those spinoffs where the spinoff and the parent segments in the year of the spinoff share no common two-digit SIC codes. The regression includes year dummies and firm-fixed effects. The numbers in parentheses below the coefficient estimates are p-values. *** indicates significance at 1% level; ** indicates significance at 5% level; and * indicates significance at 10% level.

	Unrelated Spinoffs (Single Segment)	Unrelated Spinoffs Using 2-Digit SIC-Code Measure	Unrelated Spinoffs Using Both Measures
Industry *Q*	0.041**	0.023*	0.030**
	(0.016)	(0.079)	(0.037)
Before * Industry *Q*	-0.043***	-0.025**	-0.038***
	(0.001)	(0.027)	(0.002)
Before	0.069**	0.030	0.049**
	(0.010)	(0.132)	(0.029)
No. of Firms	57	101	76
No. of Observations	264	494	372
R^2	0.148	0.075	0.120

Table IX
The Sensitivity of Spinoff Operating Profit Ratio
to Industry Operating Profit Ratio Before and After the Spinoff:
Related and Unrelated Spinoffs.

This table reports the results of regression equation (3) in which the dependent variable is now spinoff Operating Profit Ratio: (Earnings Before Interest Taxes and Depreciation)/Assets. Observations where spinoff Operating Profit Ratio is less than the sample's 1st percentile or greater than the sample's 99th percentile are excluded. Industry Operating profit Ratio is the asset-weighted industry median for the industries in which the spinoff operates. Before takes the value 1 for years -3, -2, and -1 and takes the value for years +1, +2, and +3. Year 0, the year of the spinoff, is excluded from the regression. In order to maintain comparability with the capital expenditure regressions, observations are included only when there is valid capital expenditure data. Unrelated spinoffs are identified based on the subjective assessment of the authors. The regression includes year dummies and firm fixed effects. The numbers in parentheses below the coefficient estimates are p-values. *** indicates significance at 1% level; ** indicates significance at 5% level; and * indicates significance at 10% level.

	Full Sample	Unrelated	Related
Industry Operating Profit Ratio	0.828***	0.929**	0.641*
	(0.004)	(0.033)	(0.078)
Before * Industry Operating Profit Ratio	-0.067	-0.274	0.206
	(0.766)	(0.472)	(0.434)
Before	-.006	0.035	-0.027
	(0.885)	(0.623)	(0.632)
No. of Firms	160	90	70
No. of Observations	737	420	317
R^2	0.065	0.117	0.075

Endnotes

1. Both papers simply assume that headquarters is more informed and will monitor more because the external capital market is comprised of many small investors none of whom have an incentive to become informed. But, if the external capital is supplied by a large investor such as a bank, won't they have the incentive to become informed and to monitor? Gertner, Scharfstein and Stein (1994) and Stein (1997) present models in which corporate headquarters has more incentive to become informed than outside investors and, as a result, capital allocation is more efficient.

2. Matsusaka and Nanda (1997) present a model analyzing the costs and benefits of internal capital markets that incorporates some of the benefits outlined by Alchian and Williamson and some of the costs associated with excessive investment.

3. In order to be considered a tax free event, the spinoff must meet the following five criteria as outlined in IRS Code Section 355. (1) The parent must possess control (>80% ownership of common stock voting power and > 80% ownership of each class of non-voting shares) of the subsidiary prior to the spinoff. (2) After the spinoff occurs, both the parent and the subsidiary must still be engaged in lines of business in which each has been active for at least five years. (3) The transaction must not be used as a means of avoiding dividend taxation. (4) Shareholders of the parent must maintain a significant ownership interest in both the parent and the spinoff. (5) The spinoff must have a substantial business purpose, separate from simply saving on income taxes.

4. The requirement that there must be continuity between pre and post-spinoff business lines in order for the spinoff to be considered a tax-free event helps ensure that pre and post-spinoff data reflect the operating results of a similar collection of assets.

5. Note that it is possible for a parent to strip the spinoff of financial resources such as cash prior to the spinoff. Alternatively, the parent could load the spinoff with an excess amount of debt in an effort to rid the parent of financial constraints (see e.g. Parrino (1997)) Our analysis, however, indicates that these types of actions are not generally occurring. Spinoff firms are spun-off with cash levels that are comparable to pre-spinoff years. In addition, spinoff firms begin life with debt-to-equity levels that are similar to the parent.

6. Results are insensitive to whether we weight by segment assets or segment sales.

7. This is not exactly Tobin's *Q* because we do not attempt to adjust assets to measure the replacement cost of assets. Perfect and Wiles (1994) argue that this adjustment is of little consequence.

8. See Smith and Watts (1992), Lang and Stulz (1994), Scharfstein (1998) and Rajan, Servaes and Zingales (2000) among others for examples of research using this particular proxy for *Q*.

9. Dittmar (2000) also finds that spinoff leverage is higher than the leverage of firms in the same industry. However, after controlling for differences in firm characteristics such as R&D, taxes, etc. she finds no statistically significant difference.

10. A growing body of literature documents that diversified firms generally have lower valuations than a comparable portfolio of pure-play firms, a result known as the diversification discount (Lang and Stulz (1994), Berger and Ofek (1995), Comment and Jarrell (1995), Denis and Thothadri (1999)). On average, parents do not show evidence of the diversification discount, however, regression of Industry Adjusted *Q* on an asset based Herfindahl index (not reported in tables) indicates that the more diversified is the parent, the larger is the diversification discount.

11. Schlingemann, Stulz, and Walkling (1999) find that diversified conglomerates are more likely to divest segments in industries with high capital expenditures and to invest less themselves. In contrast, we find no real differences in the industry investment rates of parents and spinoffs and we find little difference in their own investment rates. What may explain the differing results is that their sample includes asset sales, which raise cash for the parent. This may, in fact, be their motive and may explain why they invest less and want to get rid of segments that need more capital investment. Powers (2001) shows that there are systematic differences in companies that engage in asset sales, carveouts, and spinoffs.

12 A potential concern is that industry *Q* might be a significantly worse proxy for investment opportunity than is firm specific *Q*. We think this concern is of limited importance. Using Compustat data from 1980-1998 for all domestic firms having assets of at least $100 million and primary SIC codes between 1000 and 4000 (2,556 firms, 19,335 observations), we estimate fixed-effects panel regressions with normalized capital expenditures as the dependent variable and normalized operating profit, year dummy variables and either industry *Q* or firm specific *Q* as independent variables (essentially equation 2 without the *Before* dummy variable). Coefficient estimates for industry *Q* and firm specific *Q* are .0236 (t-stat = 18.40) and .0151 (t-stat = 20.86) respectively. R squared values for the two regressions are .0840 and .0891 as compared to an R squared of .0655 when neither industry *Q* or firm specific *Q* are included. Results demonstrate that, in this independent sample, the explanatory power of industry *Q* and firm specific *Q* are quite similar.

13. Means tell a slightly different story. The mean announcement effect for unrelated spinoffs is 4.79% versus 2.96% for related spinoffs. Differences are not statistically significant at conventional levels.

14. Industry adjusted investment is calculated by subtracting industry investment/assets from spinoff investment/assets. The industry value is calculated using the same "chop-shop" methodology used for calculating industry *Q*. Where we have fewer than three

years of data in either the pre- or post-spinoff periods, averages are calculated using the two or one year worth of data that is available.