SPIN-OFFS AND OPERATING PERFORMANCE

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Abstract

This study examines the relation between changes in industry-adjusted operating performance associated with corporate spin-offs and the market's assessment of the spin-off as either a value increasing or value decreasing activity. I find that the average change in industry-adjusted operating performance associated with my sample of spin-offs is not significantly different from zero. However, I also present evidence suggesting that this average result is misleading because some spin-offs appear to be value increasing while others are value decreasing. I establish that a positive and significant relation exists between parent company revaluation and a) the change in industry-adjusted operating performance of the combined but independent units, and, b) whether the parent and spun-off unit operated in different lines of business. Tests for the sensitivity of the results to underlying assumptions show that these results are robust. I conclude that some spin-offs create value, especially those in which the parent and the unit spun-off are in unrelated lines of business. However, I also conclude that some spin-offs destroy value.

Keywords: Spin-offs, Industry-adjusted Operating Performance, Parent Company

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1 Introduction

The extensive deconglomeration and downsizing witnessed in recent years carries with it the implied recognition that there are real operating benefits associated with the divestiture of units that do not fit into a corporation's core business. Only recently, however, has evidence on the costs to a company of owning disparate operating units appeared in the literature. Berger and Ofek (1995) for instance, show that the market values of conglomerates tend on average to be 17 percent below what the total value of the units these companies are comprised of would be if they were stand alone companies. One consequence of this fact is that deconglomeration may be beneficial if these discounts reflect the market's perception that inefficiencies are present. This paper presents direct evidence on the benefits associated with deconglomeration through a study of the operating cash flow effects on the parents and the units divested for a sample of corporate spin-offs. Using spin-offs as a means of assessing the real effects of divestiture provides a nice controlled set of conditions since a) there are no cash reinvestment effects as there are when a unit is sold to an outside buyer, and b) the action results in the creation of a new entity, hence, the combined performance of the parent and the spun-off unit can be directly examined in its aftermath.

Much evidence has been presented on the common stock price reactions for firms that announce they will spin-off or sell-off an operating unit, but how these reactions are related to the real cash flow effects that result from the action, for the parent as well as the unit divested, has received little attention. John and Ofek (1995), is one important exception[12]. These authors examine the relation between the abnormal common stock returns of sellers who announce unit sales and measures of changes in the postdivestiture performance of the seller. They find a positive association between these variables. The nature of the transactions they investigate, however,

[12] There is an increasing body of evidence providing both direct and indirect evidence on the benefits of deconglomeration and downsizing including Comment and Jarrell (1995), John and Ofek (1995) and Berger and Ofek (1995). In an interesting case study, Dial and Murphy (1995) analyze the effects on the value of General Dynamics Corporation that arose from downsizing activities, changes which led to an increase in shareholder wealth on the order of $4.5 billion.

does not permit them to directly evaluate the postdivestiture change in performance for the units sold. A study of spin-offs offers the opportunity to exploit an important facet of this form of divestiture, which was not available to John and Ofek. One unique difference between the outcome of a spin-off and the outcome of a sell-off is the ultimate location of the unit divested. Sell-offs involve a transaction in which the buyer is generally an outsider who absorbs the unit purchased into its current business. This implies that directly observing the unit's performance following the sale is generally not possible. In the spin-offs I study the unit becomes an identifiable stand-alone corporation, and its operating performance can be directly measured. This permits an examination of the postdivestiture combined operating cash flow performance of a portfolio of the parent and the spun-off unit. A comparison of the performance of this portfolio, suitably adjusted for industry effects, with the industry-adjusted performance of the parent prior to the spin-off event (during which of course the spun-off unit was a part of the parent) provides a clean test of whether overall operating performance has improved or worsened as a consequence of the divestiture. Further, because this measure of the change in operating performance captures the total cash flow effects for both the parent and the unit spun-off, its relation to the abnormal returns observed for the parent at the time the spin-off is first announced will provide an indication of how completely the market assesses the spin-off's real implications.

If a spin-off of a corporate unit results in the elimination of inefficiencies, then I would expect to observe an improvement in the combined postdivestiture operating performance of the parent and the units involved and a positive market response at the announcement that the spin-off is planned. If, on the other hand, the spin-off results in a loss of positive synergy or results in an increase in inefficiencies, then it may affect operating performance negatively. In this case the market would be expected to respond negatively.

The empirical evidence on spin-off announcements indicates that the capital market's reaction is on average positive and significant (for instance, Hite and Owers, 1983; Linn and Rozeff, 1985; Miles and Rosenfeld,1983; Schipper and Smith, 1983; Copeland, Lemgruber and Mayers, 1987; Cusatis, Miles and Woolridge, 1993; Slovin, Sushka and Ferraro, 1995; Seward and Walsh, 1996; Daley, Mehrotra and Sivakumar, 1997; Desai and Jain, 1999; Krishnaswami and Subramaniam, 1999). The results for the sample studied here also indicate a positive abnormal revaluation on average. However, most studies of spin-off announcements indicate that the market's response is not uniformly positive across all spin-offs. For instance, in my sample I find that roughly 61 percent of the sample spin-off announcements are associated with positive abnormal stock returns implying that 39 percent are negative. This result suggests the possibility that some spin-offs are perceived to be beneficial actions, while some are not. My results on operating performance support this conclusion with the finding that the combined change in the industry-adjusted operating cash flow performance of the parent and the spun-off unit for the cases in my sample is also not uniformly positive across all cases. My cross-sectional tests in fact show that there is a positive and significant relation between the abnormal revaluation of the firm and changes in operating performance, a finding entirely consistent with the observation of both positive and negative values for the variables just mentioned. In addition I find that firms that spin-off units operating in industries outside the parent company's core business are associated with greater abnormal returns than are firms that spin off related units. This result suggests that while some firms' spin-off decisions are apparently value reducing, others, especially those that result in the parent focusing more closely on its core business, are value increasing.

These results provide a collective explanation for the fact that the evidence on the operating consequences of spin-offs is mixed (such as in Woo, Willard and Daellenbach , 1992). A finding of no average improvement in operating performance is however just what I might expect to observe if some spin-offs in fact eliminate inefficiencies while others eliminate beneficial synergies[13].

Section 2 reviews economic motives for spin-offs. Section 3 describes the sample and the data examined. Section 4 presents the empirical results and Section 5 summarizes the paper.

[13] The difference between a spin-off and other forms of corporate divestiture is that ownership does not change hands in a spin-off. A pure spin-off involves a tax-free distribution of shares in the new entity to parent company shareholders on a pro rata basis. The spun-off unit is also assessed a share of the parent's debt capital and is given its own management team. The action in many ways is a perfect example of deconglomeration. A spin-off is considered tax-free when the parent company retains at most a small fraction of the equity. A spin-off is handled much like a stock dividend. The normal sequence of events begins with the parent announcing its intention to spin-off assets, usually pending approval of the tax-free status of the distribution by the Internal Revenue Service. Next, the board of directors and shareholders vote to approve the spin-off. At some point in the sequence, the board sets the holder-of-record and payment dates. Finally, stock of the company that is spun off is issued to shareholders of the parent company on the payment date. Further details on the mechanics of a spin-off can be found in Cusatis, Miles and Woolridge (1993); (see also Hite and Owers, 1983; Linn and Rozeff, 1985; Miles and Rosenfeld, 1983; Schipper and Smith, 1983).

2 Economic motives for spin-offs

A corporate spin-off occurs when a firm's management decides that the parent company, the company to be spun off, or both, would be better off if run as separate entities. This does not necessarily imply that operating performance will improve, only that in management's' view, separation is the warranted action. Managers of corporations are subject to often-conflicting incentive structures, which nevertheless influence the decisions they make. Two prominent views of these incentives imply that some managers may be motivated to take actions that improve shareholder wealth (i.e. are value increasing) and some may take actions that improve managerial welfare but not shareholder wealth (i.e. are value decreasing). Non-value maximizing decisions can for instance take the form of perquisite consumption (Jensen and Meckling, 1976), poor resource allocation as for instance in the decision to diversify (Morck, Shleifer and Vishny, 1990; Berger and Ofek, 1995), or wealth redistributions from debtholders to equityholders as originally discussed in Jensen and Meckling (1976).

Prominent among positive explanations for the occurrence of spin-offs is that managers spin-off units in order to eliminate inefficiencies, thus leading to value creation in the process (see for instance, Hite and Owers, 1983; Linn and Rozeff, 1985; John and Ofek, 1995). The source of these inefficiencies is potentially related to a diseconomies of scope problem. Coase (1937) for instance postulates that a firm emerges to reduce the costs inherent in market transactions. These costs are reduced when the entrepreneur (manager) is able to execute a specific transaction at less cost within the firm than within the marketplace. Conversely, a spin-off would appear to be optimal if it is cheaper to execute a transaction through the market than within the firm. Williamson's (1985) discussion of "diminishing returns to management" also provides several reasons for why inefficiencies may arise within an organization that can be alleviated through a spin-off. He argues that not only are incentives impaired when market transactions are replaced by intrafirm transactions, but also that as a firm becomes larger it may become more bureaucratic. Williamson (1985) suggests that there is a two-part cost of bureaucratization. First, well-intentioned managers regularly take on complex problems that are beyond their abilities to manage. The manager's cognitive abilities are not infinite and as the firm grows his finite abilities are stretched to the limit and beyond. Second, managers tend to pursue personal goals or a hidden agenda (see also Shleifer and Vishny, 1988, 1989).

Thus, we can say that inefficiencies may arise when the firm loses its comparative cost advantage over the market. As the firm grows past a certain point the costs associated with impaired managerial incentives coupled with the agency costs associated with bureaucracy surpass any synergy or informational advantage associated with maintaining the single firm. At this point restructuring to eliminate these inefficiencies becomes optimal.

Spin-offs undertaken for reasons unrelated to the elimination of inefficiencies however, or because of mistakes in judgment (see Roll, 1986), may result in the loss of positive synergies. Such actions are entirely consistent with the presence of the very information processing problems mentioned earlier (Williamson, 1985)[14]. They may also be due to misaligned incentives on the part of managers. Jensen and Murphy (1990) present evidence suggesting that the incentives for managers of domestic U.S. corporations to maximize shareholder wealth may be weak.

Aron (1991) has suggested an alternative motivation for why spin-offs might arise. She argues that the expectation that a spin-off can occur gives division managers of conglomerate firms the incentive to make value-maximizing decisions. The premise is that a division manager who expects to be compensated following the spin-off based upon the market value of the spun-off company's equity, will strive to make decisions that will maximize the division's equity value. Prior to the spin-off, the diversified nature of the firm makes the stock price of the parent a noisy measure of any individual manager's performance. Using the stock price of the spun-off company as an indicator of the division manager's performance eliminates the noise due to the multiproduct nature of the parent company. Aron takes as a given that there are good economic reasons for why conglomerates will emerge. Basically, she assumes that there are economies associated with being a conglomerate[15]. Following a spin-off, the division manager receives a bonus that is based upon the difference between the market value of the spun-off company's equity and some benchmark, hence the manager could either gain or lose wealth through this bonus function. This drives the manager's incentive to select value maximizing projects prior to any spin-off occurring, but also to propose a spin-off (accompanied by the specifics of the bonus function),

[14] There are of course notable counterexamples of how the adoption of managerial incentive programs have led to increases in shareholder wealth, such as the cases of Disney (O'Byrne, 1992) and General Dynamics (Dial and Murphy, 1995). Haubrich (1994) examines the pay/performance relation within an optimal contracting setting with risk averse agents. He finds that the magnitudes of his results are in line with the empirical estimates of Jensen and Murphy, implying that the latter results are what would be predicted in some optimal contracting settings.

[15] As pointed out in the introduction, the assumption that there are economies which warrant the creation of conglomerates seems to be at variance with recent results on conglomerate valuation and the benefits of downsizing, cf. 1.

whenever she has identified a major new project that if implemented will have an economically significant and positive effect on the value of the division she operates. One complication however, is that any given CEO must agree to spin-off some divisions from time-to-time, or else the managers will view the probability of a spin-off as low or at worst zero. Spin-offs must therefore occur even if it means that the assumed economies of conglomeration are lost. One empirical implication of the model is that the actual announcement of a spin-off may be associated with either positive or negative abnormal stock returns. This follows because the spin-off announcement will reveal information about the net effect of gains due to the project motivating the division manager to propose the spin-off in the first place, and losses of assumed economies that arise from conglomeration. In the absence of such economies from conglomeration however, all spin-offs will be associated with value increases in Aron's model. These value increases may in fact be due to the discovery of new efficiency enhancing projects. In light of the results reported by Berger and Ofek (1995) and Comment and Jarrell (1995), the evidence seems to weigh-in against the existence of economies of scope arising in conglomerates.

3 The sample

A spin-off must meet the following conditions to be included in the sample. First, a non-taxable spin-off must have occurred in which the parent did not retain an ownership interest in the spun-off unit. The initial sample was identified from an exhaustive search of the Wall Street Journal Index and Moody's News Briefs, in conjunction with an examination of the sample lists employed by Miles and Rosenfeld (1983), Schipper and Smith (1983) and Linn and Rozeff (1985)[16]. The sample spans the period 1973-1995. The Wall Street Journal Index is used to follow each spin-off announcement through its ex-date to confirm that the spin-off was indeed completed. Second, the spin-off must have been voluntary. Third, the parent and spun-off company must have been primarily industrial businesses. Fourth, there must be at least two years of operating data for the parent company available on the COMPUSTAT files out of the three years immediately prior to the spin-off, and at least two years of operating data available for both the surviving parent and the spun-off unit out of the three years immediately following the spin-off year. Fifth, there must be at least three companies in the same industry as the parent (spun-off unit) not including the sample firm, each with data available on the COMPUSTAT files for the same years in which data were available for the parent (spun-off unit). This restriction is necessary because I industry-adjust the operating performance of the sample firms using the median value of the operating performance of the comparison companies. Finally, the parent firm's equity had to be listed on the NYSE or on the AMEX at the time the planned spin-off was first announced. The final sample contains 69 non-taxable spin-offs that took place during the period 1973 through 1995[17]. Panel A of Table 1 presents the calendar year distribution of the final sample.

Panel B of Table 1 presents statistics on how large the spin-offs in the sample are in relation to the sum of the postdivestiture pseudo-market values of the surviving parent and the spun-off company. Pseudo-market value is measured at the end of the first fiscal year following the spin-off and is equal to equity market value plus the book values of long-term debt and preferred stock. The spun-off companies in the sample represent on average 24.07 percent of the post spin-off sum (median=14.71 percent). Therefore, the spin-offs in the sample represent a significant fraction of the parent firm. This contrasts for instance, with the statistics presented by Hite and Owers (1983) who report a median spin-off size of 6.6 percent. My sample is however consistent with Seward and Walsh (1993) who report a mean of relative size of 22.1 percent[18]. These differences are most likely due to the period studied. My sample period matches the period studied by Seward and Walsh more closely than it does the period studied by Hite and Owers.

Panel C of Table 1 provides a comparison of the SIC codes of the parents and the spun-off companies. Roughly 61 percent of the spun-off units were in a completely different line of business than their parent firms. That is, using the main lines of business of the parents, the respective SIC codes of the parents and the spun-off units did not match even at the one digit level for 61 percent of the cases. On the other hand, about sixteen percent of the sample did match at either the two, three or four digit level. This evidence is largely indicative of deconglomeration, however it is also clear that units in lines of business related to the parent companies' are sometimes spun off.

[16] We are grateful to these authors for providing us with lists of the companies used in their studies.

[17] We also constructed a larger sample imposing the requirement that three years of data be available on COMPUSTAT for the fourth and fifth screens. This decreased the overall sample to 54 cases. Our results were basically unchanged when we analyzed the smaller sample and are discussed in Section 4.5.

[18] The average relative size for our sample spin-offs is also comparable to Vijh (1994), Daley, Mehrotra and Sivakumar (1997), Desai and Jain (1999), Krishnaswami and Subramaniam (1999).

Table 1. Descriptive statistics for the final sample

Panel A: The distribution of spin-offs by year

Panel A provides the number of sample spin-offs per year. Panel B provides some location statistics describing the size of the spin-off company relative to that of the sum of the parent and spin-off combined, all in terms of book values of assets. Panel C shows the distribution of industries for both the parent and spin-off companies.

Year	Number of Cases	Year	Number of Cases
1973	1	1985	6
1974	1	1986	4
1975	2	1987	4
1976	1	1988	12
1977	1	1989	4
1978	1	1990	5
1979	1	1991	1
1980	5	1992	1
1981	4	1993	2
1982	2	1994	2
1983	2	1995	4
1984	5	**Total**	**69**

Panel B: Relative spin-off size

The relative asset size of a spin-off is equal to the pseudo-market value of the spun-off company divided by the sum of the pseudo-market values of the parent and the spun-off company at the end of the first fiscal-year following the spin-off. Pseudo-market value equals the market value of equity plus the book values of long-term debt and preferred stock.

Mean	24.07%
First quartile	7.26%
Median	14.71%
Third quartile	38.22%

Panel C: SIC match between parent and spun-off company

A match at the four-digit level implies that the parent spun-off a firm that is very closely related to it in terms of line of business.

4 digit match	2
3 digit match	4
2 digit match	6
1 digit match	15
No SIC match	42
Total	69

4 Empirical methods and results

4.1 Abnormal asset returns

The CRSP excess returns file is used when computing the effect of the spin-off announcements on the stock prices of the parent companies[19]. I compute abnormal returns over the period from one day prior to the announcement that a spin-off is planned through the date of the spin-off. My rationale for evaluating this period is that it will reflect the market's full assessment of the impact of the spin-off including the resolution of any uncertainty about whether the spin-off would occur or not. Copeland, Lemgruber, and Mayers (1987) for instance find that 11 percent of

[19] CRSP excess returns are calculated using benchmark portfolios based upon Scholes and Williams (1977) betas. The firm's stock is placed into one of 10 portfolios based on the ranking of its prior beta. Excess returns are then computed as the difference between the actual return and the appropriate benchmark portfolio's return.

spin-off announcements do not lead to an actual spin-off. The cumulative average abnormal stock return for my sample of parent companies from the date the first announcement appeared in the Wall Street Journal through the date of the spin-off is equal to 3.33 percent, the median is equal to 3.93 percent. An average positive abnormal revaluation is consistent with the results that have been presented elsewhere in the literature (for instance, Hite and Owers, 1983; Linn and Rozeff, 1985; Miles and Rosenfeld, 1983; Schipper and Smith, 1983; Copeland, Lemgruber and Mayers, 1987; Cusatis, Miles and Woolridge, 1993; Seward and Walsh, 1996; Daley, Mehrotra and Sivakumar, 1997; Desai and Jain, 1999; Krishnaswami and Subramaniam, 1999). I also compute asset abnormal returns[20]. In computing asset abnormal returns I adjust the equity abnormal returns to reflect the fact that their contribution to the overall asset revaluation of the parent company is proportional to the relative contribution that equity makes to the total value of assets. To illustrate, suppose that a firm is funded by only debt and equity, then the total asset return over some finite interval is given by $\frac{dV}{V} = \left(\frac{dS}{S}\right)\left(\frac{S}{V}\right) + \left(\frac{dD}{D}\right)\left(\frac{D}{V}\right)$ where S is the total value of equity, D is the total value of debt, V = S+D, and $\frac{dV}{V}$ is the total asset return. Schipper and Smith (1983) present evidence suggesting that debt values are on average unaffected by spin-offs. I begin with the assumption $\frac{dD}{D} = 0$, but return to this topic in Section 4.5 where I discuss the sensitivity of the results to this as well as other issues[21].

The total asset abnormal return is therefore initially defined as the equity abnormal return, $\left(\frac{dS}{S}\right)$ multiplied by $\frac{S}{V}$. My initial definition follows immediately from the assumption $\frac{dD}{D} = 0$. For my purposes V is pseudo-total market value and is equal to the preannouncement market value of equity, S, plus the book values of long-term debt and preferred stock. I calculate $\left(\frac{dS}{S}\right)\left(\frac{S}{V}\right)$ and label this variable ΔAV The average asset abnormal return is equal to 1.90 percent**,** the median is equal to 1.85 percent and 61 percent of the individual abnormal returns are positive. However, the individual values range from -51.40 percent through 54.76 percent, with the bottom 10 percent less than or equal to –11.88 percent and the top 10 percent greater than or equal to 11.35 percent. Abnormal asset returns are the correct measure when relating the market's response to a spin-off to the subsequent weighted operating returns of the parent and the spun off company following the spin-off. The reason is that my measure of operating performance is a return on total assets and is a measure of potential distributions to both bondholders and stockholders[22]. I also computed results using only equity abnormal returns. The results using equity abnormal returns are analyzed later as a means of testing the hypothesis that the motivation for a spin-off is to redistribute wealth from bondholders to stockholders. I return to this issue in Section 4.5 [23].

4.2 Measuring industry-adjusted operating performance

The empirical measure of operating performance I examine is closely related to the measure used by Healy, Palepu, and Ruback (1992) in their study of the effects of mergers on corporate performance. The ratio of fiscal-year end pretax earnings before depreciation, goodwill, interest expense and interest income from short-term investments to the pseudo-market value of the firm's assets is the variable that forms the basis for my analysis of changes in performance. I measure the pseudo-market value of assets as the sum of the book values of long-term debt and preferred stock plus the market value of equity as of the beginning of the fiscal year. This ratio provides an operating return that minimizes the effects of different accounting practices across firms and allows for a comparison of operating results before payments to security holders, or the government, are subtracted.

[20] See also Healy, Palepu and Ruback (1992).

[21] Parrino (1997) presents evidence on an isolated case in which a wealth transfer did occur, however the restructuring (Marriott's spin-off of its lodging management and other related management businesses) in Parrino's words "..is highly unusual in that Marriott distributed shares that represented almost 80% of the value of its equity" (1997, p. 242), unlike what is normally observed. The Marriott case is not a member of the sample examined in this paper.

[22] Of course other announcements, unrelated to the spin-off, were made during the period from the announcement through the spin-off. Many of the sample firms had additional announcements about the status of the impending spin-off during this period. These additional announcements undoubtedly influenced the market's beliefs about the probability of the spin-off being completed. We believe that since the spin-off company makes up such a large portion of the combined firm (see panel B, Table 1), and since there were additional announcements relating to the spin-off during the period examined, that the impending spin-off is the dominant factor affecting the abnormal returns calculated. Copeland, Lemgruber, and Mayers (1987) measure the effect of successive spin-off announcements on equity values and estimate an average abnormal return of 5.02% for a completed spin-off.

[23] The average equity abnormal return for the sample is equal to 3.33%, the median is equal to 3.93% and 61% of the individual equity abnormal returns are positive. However, the individual values range from –54.58% through 71.48%, with the bottom 10% less than or equal to –19.21% and the top 10% greater than or equal to 20.267%.

The variable therefore is an indicator of the performance of business operations and henceforth I will refer to it as the operating performance of the firm.

I control for the influence of general economic conditions by adjusting the operating performance of each sample firm. The adjustment I make is to subtract the median firm operating performance for the sample firm's industry from the sample firm's operating performance. The industry for each firm is identified by the four-digit Standard Industry Classification (SIC) codes as reported by Compustat[24]. The industry-adjusted measure of the operating performance for firm i in all years t prior to the spin-off is given by

$$PREOPER_{it} = \frac{CF_{it}}{ASSET_{it-1}} - \frac{CF_{It}}{ASSET_{It-1}}. \qquad (1)$$

In equation (1), CF_{it} is equal to fiscal-year end pretax earnings before depreciation, goodwill, interest expense and interest income from short-term investments, for firm i and CF_{It} is corresponding industry median. The variable $ASSET_{it-1}$ is the pseudo-market value of the assets of firm i and $ASSET_{It-1}$ is the corresponding industry median, measured as the book values of long-term debt and preferred stock plus the market value of equity at the end of t-1.

4.3 Operating performance changes: Cash flow returns

In this section I present a comparison of the industry adjusted operating performance of the parent firm prior to the spin-off, and the combined industry-adjusted operating performance of the parent and the spun off company following the spin-off, weighted appropriately to account for how each contributed to the pre-spin-off assets of the parent[25]. The reasoning behind combining the parent and spin-off data in the post-spin-off period is that this will directly reveal the total operating effects that arise, since there may be changes for both the parent and the spun off company ex post. It is the change in total operating performance that is of interest, both to capital market investors and to those taking a larger view of the net benefits to the economy from this type of resource allocation mechanism. Combined operating performance following the spin-off is a weighted average of the parent and spinoff companies' operating performance. Because a spin-off leads to two business operations (the `new' parent and separately, the spun-off unit), there is a direct analogy to the approach taken by Healy, Palepu, and Ruback (1992) whose comparison portfolio in their examination of performance changes due to mergers is a weighted average of the premerger operating returns of the acquiring and target firms. Equation (2) shows how I calculate combined ex post industry-adjusted performance.

Measurement of the post spin-off deflator (the variable ASSET) is important in my evaluation of changes in operating performance. If the deflator used to measure the post spin-off operating return includes the present value of the cash flow effects of the spin-off, as would be the case if I simply used the post spin-off equity market value in computing the variable ASSET, then the operating return would in principal equal the normal risk-adjusted return. That is, the deflator would scale the cash flow so that the computed return would reflect the normal expected return investors required on the asset reallocation. Such a return would not reveal any gains achieved from the spin-off since those gains would have been capitalized into the denominator of the return calculation. For us to identify whether an abnormal operating return was actually earned as a result of the spin-off, I must scale the cash flow with the pseudo-market value V that would have prevailed had the market's assessment of the value change due to the spin-off not been reflected in V.

Between the announcement of the spin-off and the spin-off date I can observe the total value change in the equity of the parent company as assessed by the market. This value change is the dollar change in the equity of the pre spin-off company and is a reflection of the market's perception of the present value of the cash flow changes to be produced from the spin-off. It is possible however that the total revaluation observed is made up of two parts: A change in the value of the surviving parent's equity, and a change in the value of the spun-off unit's equity. Thus, it may be incorrect to attribute all of the revaluation to an adjustment in the value of the surviving parent alone. The appropriate split in the revaluation of the pre spin-off firm between the surviving parent and the spun-off unit however cannot be directly determined since the respective values of these two entities prior to the spin-off cannot be observed. I approach this problem by examining the sensitivity of my results to three alternative assumptions about how the equity value change is split between the surviving parent and the spun-off company.

[24] When computing industry performance, the performance of the firm in the sample that is to be evaluated is deleted to prevent biasing the benchmark numbers.

[25] The large relative size of the spin-offs when compared to combined firm value indicates that these spin-offs (see panel B of Table 1) are significant economic events in the life of the parent company. This large relative size provides justification for attributing much of the change in operating returns subsequent to the spin-off to the event itself.

$$POSTOPER_{it} = \frac{CF_{pit}}{ASSET_{pit-1}} \bullet w + \frac{CF_{sit}}{ASSET_{sit-1}} \bullet (1 - w) - \frac{CF_{pIt}}{ASSET_{pIt-1}} \bullet w - \frac{CF_{sIt}}{ASSET_{sIt-1}} \bullet (1 - w)$$

$$w = \frac{ASSET_{pit-1}}{ASSET_{pit-1} + ASSET_{sit-1}}. \quad (2)$$

where p indicates the parent and s indicates the spun off unit, and CF and ASSET are as defined for equation (1).

Assumption 1 takes the extreme view and attributes all of the pre spin-off revaluation to a revaluation of the surviving parent company. Assumption 2 is that the split is proportional to the equity market values of the surviving parent and the spun-off unit immediately following the spin-off. Under Assumption 3 the spun-off unit is allocated twice the proportional contribution attributed to it under Assumption 2. An illustration should help to clarify how Assumptions 1 and 2 are implemented. Suppose the total equity market values of the surviving parent and the spun-off unit immediately following the spin-off are \$75 and \$25 respectively, and that the abnormal revaluation of the pre spin-off firm's equity had been \$20. Under Assumption 1, 100 percent of the revaluation, or in this case \$20, would be attributed to a revaluation of the surviving parent's equity. The surviving parent's equity market value would then be assigned an adjusted value of \$55 (\$75 - \$20). Under Assumption 2, 75 percent ($= \frac{\$75}{(\$75+\$25)}$) of the pre spin-off value change would be attributed to a revaluation in the surviving parent's equity and the remaining 25 percent to revaluation of the spun-off unit's equity. The post spin-off values of the equities of the surviving parent and spun-off unit would be adjusted accordingly by subtracting \$15 (.75 x \$20) from the surviving parent's value and \$5 (.25 x \$20) from the spun-off unit's value. Under Assumption 3, the split would then be \$10 (2 x .25 x \$20) for the spun-off unit and \$10 for the surviving parent.

The change in industry-adjusted operating performance is computed for each case in the sample as the three-year median post-spin-off industry-adjusted performance of the combined portfolio, equation (2), minus the three-year median pre-spin-off industry-adjusted performance of the parent. I label this variable $\Delta OPER_i$. Year 0, the year in which the spin-off occurs, is always excluded because of both incomplete data, potential differences in accounting practices, and to avoid any biases that might arise because of how the firms account for the cost's associated with doing the spin-off. The mean change in operating performance under Assumption 1 is equal to -1.11 percent, which is not significantly different from zero at any meaningful level (t=-0.77). The median change is -0.50 percent. Finally, 46 percent of the individual changes are greater than zero, and the sign and sign ranks test of the null are not significant at the .05 level (p-values equal respectively, .631 and .761). Similar results are found if the basis for calculating operating performance is either Assumption 2 or Assumption 3[26]. The initial conclusion is that on average no significant improvements in industry-adjusted operating performance typically accompany the spin-offs in the sample. However if some spin-offs increase value while some do not, then finding that the mean change is not significantly different from zero is not surprising. The individual changes however range from –50.00 percent through 31.98 percent. Further, 10 percent of the cases have values less than or equal to –14.26 percent while another 10 percent have values greater than or equal to 9.60 percent. The evidence therefore suggests that some spin-offs are associated with improvements in operating performance while some are not. Whether the distribution of these changes is simply due to noise or whether it reflects real effects that are recognized by the capital market ex ante, requires an examination of the cross-sectional relation between $\Delta OPER_i$ and the market's revaluation of the parent's assets. A positive and significant relation would indicate that increases in value are associated with increases in performance, and decreases in value are associated with decreases in performance.

4.4 Cross-sectional analysis

The prior section elaborated on the three assumptions I make regarding the attribution of the pre spin-off revaluation of the firm to the revaluations of the surviving parent and the spun-off unit. Table 2 is based upon the conditions outlined as Assumption 1, that all of the revaluation is attributable to revaluation of the surviving parent. Tables 4 and 5, discussed in Section 4.6, present results under the application of Assumptions 2 and 3 respectively.

[26] The mean change in operating performance under Assumption 2 is equal to –1.33% which is not significantly different from zero (t=-.82). The median change is 0.06%, while 51% of the changes are greater than zero and the sign and sign ranks tests of the null are not significant (p-values equal respectively, 1.0 and .97. The mean change in operating performance under assumption 3 is equal to –1.41% which is not significantly different from zero (t=-.1.01). The median change is –0.51%, while 48% of the changes are greater than zero and the sign and sign ranks tests of the null are not significant (p-values equal respectively, .81 and .75).

Table 2. Cross-sectional regression results: Cumulative and compound abnormal asset returns

Coefficient estimates and summary statistics for regressions of cumulative and compound asset abnormal returns, ΔAV, on the industry-adjusted change in operating performance, and on a dummy variable indicating whether the parent and spun-off unit were not in the same line of business. The dependent variable, ΔAV, asset abnormal return, is equal to the equity abnormal return for the parent multiplied by the ratio of the parent's preannouncement total equity market value, S, to its pseudo-total market value, V. The implied assumption is that the percentage change in the value of the parent's debt at the spin-off announcement is typically zero. The variables ΔOPER is defined as the change in the firm's industry-adjusted average operating cash flow before depreciation, goodwill, interest expense and interest income from short-term investments, deflated by the company's pseudo-market value of assets. The variable SIC is defined as a dummy variable that takes the value 1 when the SIC codes of the parent and spun-off companies do not match at the one-digit level. Results are presented for cases in which at least two years of operating data prior to and after the spin-off. The sample size for all regression models presented in this table is n =69 (p-values for tests that the coefficients equal zero are reported in parentheses).

	Cumulative Abnormal Returns			Compound Abnormal Returns		
	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	0.030	-0.032	-0.009	0.038	-0.023	-0.001
	(.030)	(.194)	(.684)	(.032)	(.426)	(.980)
ΔOPER	0.649		0.606	0.602		0.553
	(.001)		(.001)	(.001)		(.001)
SIC		0.084	0.063		0.083	0.060
		(.009)	(.023)		(.030)	(.094)
Adj. R^2	.28	.08	.33	.17	.05	.19
F-statistic	27.82	7.20	17.54	15.04	4.90	9.17
(p-value)	(.001)	(.009)	(.001)	(.001)	(.030)	(.001)

Table 3. Cross-sectional regression results: Cumulative and compound abnormal equity returns

Coefficient estimates and summary statistics for regressions of cumulative and compound equity abnormal returns, on the industry-adjusted change in operating performance, and on a dummy variable indicating whether the parent and spun-off unit were not in the same line of business. The dependent variable is equal to the equity abnormal return for the parent. The variables ΔOPER is defined as the change in the firm's industry-adjusted average operating cash flow before depreciation, goodwill, interest expense and interest income from short-term investments, deflated by the company's pseudo-market value of assets. The variable SIC is defined as a dummy variable that takes the value 1 when the SIC codes of the parent and spun-off companies do not match at the one-digit level. Results are presented for cases in which at least two years of operating data prior to and after the spin-off. The sample size for all regression models presented in this table is n =69 (p-values for tests that the coefficients equal zero are reported in parentheses).

	Cumulative Abnormal Returns			Compound Abnormal Returns		
	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	0.048	-0.039	-0.010	0.053	-0.032	-0.002
	(.013)	(.231)	(.727)	(.022)	(.396)	(.965)
ΔOPER	0.816		0.753	0.776		0.704
	(.001)		(.001)	(.001)		(.001)
SIC		0.119	0.093		0.117	0.087
		(.006)	(.014)		(.019)	(.060)
Adj. R^2	.25	.10	.31	.17	.07	.20
F-statistic	23.55	8.22	15.93	14.62	5.81	9.43
(p-value)	(.001)	(.006)	(.001)	(.001)	(.019)	(.001)

As already pointed out, neither the asset abnormal returns for the sample cases nor the change in industry-adjusted operating performance numbers are uniformly positive. If abnormal increases in value are associated with increases in industry-adjusted operating performance and conversely decreases in value are associated with decreases in performance, then I should expect to see a positive and significant association between asset abnormal returns, ΔAV_i , and the change in industry-adjusted operating performance, $\Delta OPER_i$, in a cross-sectional regression of the former on the latter. Column (1) of Table 2 presents the regression result, which indicates that there is a positive and significant relation between

abnormal returns and changes in industry-adjusted operating performance: coefficient estimate 0.649, p-value .001. This result suggests that expost operating performance changes are incorporated into the market's revaluation of the firm at the initial announcement. This does not however indicate that all spin-offs are beneficial.

The benefits of deconglomeration may be magnified for cases in which the parent and the spun-off unit operate in different lines of business. One implication of Berger and Ofek's (1995) research is that the greater the difference between the industry of the parent and spun-off company, the more likely it is that the spin-off will reduce excess inefficiencies. This conjecture would seem to follow naturally from their finding that conglomerates tend to be priced below the fair market value of the units they are made up of. I define SIC_i as a dummy variable that takes the value of 1 when the parent and spun-off company's Standard Industrial Classification Codes do not match at the four, three, two, or even one digit levels, and 0 otherwise. I begin by testing whether there is any relation between abnormal asset returns and SIC_i. The estimation results are presented in column (2) of Table 2. These results indicate that there is a positive and statistically significant relation between abnormal asset returns and the indicator of whether the parent and the spun-off unit operated in different lines of business. The coefficient estimate for SIC_i equals 0.084 and the p-value for the test of whether it equals zero is .009. This evidence suggests that in my sample there were benefits to spinning-off unrelated business lines.

Table 4. Cross-sectional regression results: Cumulative and compound abnormal asset returns. Parent and spinoff share the revaluation in proportion to their relative market values immediately after the spinoff

Coefficient estimates and summary statistics for regressions of cumulative and compound asset abnormal returns, ΔAV, on the industry-adjusted change in operating performance, and on a dummy variable indicating whether the parent and spun-off unit were not in the same line of business. The dependent variable, ΔAV, asset abnormal return, is equal to the equity abnormal return for the parent multiplied by the ratio of the parent's preannouncement total equity market value, S, to its pseudo-total market value, V. The implied assumption is that the percentage change in the value of the parent's debt at the spin-off announcement is typically zero. The variables ΔOPER is defined as the change in the firm's industry-adjusted average operating cash flow before depreciation, goodwill, interest expense and interest income from short-term investments, deflated by the company's pseudo-market value of assets. The variable SIC is defined as a dummy variable that takes the value 1 when the SIC codes of the parent and spun-off companies do not match at the one-digit level. Results are presented for cases in which at least two years of operating data prior to and after the spin-off. The sample size for all regression models presented in this table is n =69 (p-values for tests that the coefficients equal zero are reported in parentheses).

	Cumulative Abnormal Returns			Compound Abnormal Returns		
	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	0.023	-0.032	-0.024	0.039	-0.039	-0.029
	(.130)	(.194)	(.307)	(.063)	(.231)	(.353)
□OPER	0.376		0.351	0.472		0.437
	(.004)		(.005)	(.007)		(.009)
SIC		0.084	0.077		0.119	0.111
		(.009)	(.012)		(.006)	(.007)
Adj. R^2	.10	.08	.17	.09	.10	.17
F-statistic	8.90	7.20	8.19	7.75	8.22	8.12
(p-value)	(.004)	(.009)	(.001)	(.007)	(.006)	(.001)

My use of a dummy variable that equals 1 when the SIC codes of the parent and spun off unit do not match implicitly assumes that the only effects from the association of two operating units can come from a horizontal relation. If a vertical relation existed and was beneficial, separation of a pair of companies that enjoyed such a relation could be damaging. The coding system used to define the variable SIC would treat cases where there is a vertical relation as if the two businesses were however unrelated. Recall that I define SIC to take the value 1 when the SIC codes of the parent and spun-off unit do not match. The estimated coefficient on the dummy variable SIC (see Tables 2-5 and Tables A1-A2) is always positive and significant. This suggests that when no horizontal relation exists, separation on average leads to an improvement, ceteris paribus. I extended the analysis by assessing whether a vertical relation could have reasonably been assumed to exist between the parent and the spun-off unit for those cases in which no SIC code match at either the four, three, two or one digit level was found. I used information in the reports on the spin-offs as well as the nature of the businesses of the parent and the spun off unit to identify whether a vertical relation had existed. Based upon this analysis I identified 12 cases in which a vertical relation

between the parent and the spun-off unit could have existed.

I then defined a new variable labeled VH that takes the value 1 if no horizontal *or* vertical relation existed and 0 otherwise. The regression models were then estimated substituting VH for SIC, but including $\Delta OPER_i$ as before. The results were qualitatively the same as those already discussed and so are not reported.

Column (3) of Table 2 presents the results of a multiple regression of abnormal returns on ΔOPER and SIC. These results are consistent with the simple regression results presented in columns (1)-(2). The magnitudes of the coefficients are similar and the signs are the same. Likewise the p-values for tests that the coefficients equal zero are both small. The null that all of the coefficients equal zero is rejected using the F-test (p-value .001). Finally, the adjusted R^2 for the model is a quite respectable 33 percent.

Recent research (Barber and Lyon, 1997) has suggested that long run returns measured as the summed (cumulative) excess return may be a biased indicator but that compound (holding period) returns can act to mitigate this bias. One plus the excess return for each day during the sample period was compounded from the announcement of the spin-off through its completion date. The holding period return for the entire time interval was then computed as the total compounded value minus 1. The holding period returns were then used in the regression studies in place of cumulative abnormal returns. Columns (4) – (6) of Table 2 present the results based upon compound excess asset returns. The results are qualitatively the same as those presented in columns (1) – (3). The regression results in which the dependent variable is the cumulative excess return and those in which the dependent variable is the compound excess return, do not differ markedly. These similarities suggest that the biases highlighted by Barber and Lyon (1997) are not a material problem in my sample data.

4.5 Sensitivity of the results to return measurement, sample composition and relative spin-off size

4.5.1 Implications of wealth transfers as a consequence of a spin-off

The total asset return upon which the results presented in Table 2 are based, reflects the assumption that the value of the parent company's debt is unaffected by the spin-off. In my previously defined notation the assumption being made is that $\frac{dD}{D} = 0$. I defined the asset abnormal return in that case as $\Delta AV = \frac{dV}{V} = \left(\frac{dS}{S}\right)\left(\frac{S}{V}\right)$, where $\frac{dS}{S}$ is the equity abnormal return, S is equity value and V is the pseudo-total market value of the firm measured as the market value of equity plus the book values of long-term debt and preferred stock.

Suppose that spin-offs lead to changes in operating performance that can be either good or bad and that the market can discern the direction, but that wealth transfers between the debtholders and the equityholders do not occur. Under these circumstances the change in the value of the firm's debt will be either positively correlated with the change in equity value, or at worst will exhibit zero correlation (the case in which the debt value does not change)[27]. The former could arise because the debt is risky and the payoffs on the debt depend in part upon future changes in operating performance. If the debt is not risky, then any change in operating performance will have no effect on its value, but could affect the value of the equity. In this case the correlation between the change in the equity's value and the change in the debt's value would be zero. Assume for illustrative purposes that the change in debt value is proportional to the change in equity value, but that wealth transfers do not occur, ie. αdS = dD, where $\alpha \geq 0$. A positive and significant relation between ΔAV and the change in operating performance, as documented in Table 2 would in this case be indicative of the results that would be found had the change in debt value been directly included in the computation of the change in asset value ΔAV. This follows because either the debt value would change in the same direction as the equity value, or it would not change at all. The latter case is the assumption underlying the metric used in Table 2.

On the other hand suppose that the value of the debt moved in the opposite direction to the change in the value of the equity. In fact, suppose the only reason for a change in the value of the equity was an opposite change in the value of the debt (a wealth transfer). Then I should not expect to see any relation between the equity value change and the change in operating performance. Likewise, because of the way in which I construct the variable ΔAV $\left\{\Delta AV = \frac{dV}{V} = \left(\frac{dS}{S}\right)\left(\frac{S}{V}\right)\right\}$, I should not expect to see any relation between ΔAV and the change in operating performance. Table 2 demonstrates that a positive relation exists between abnormal asset return, ΔAV, and the change in operating performance. I present results on the relation between the abnormal equity return and the change in operating performance in Table 3 and find a positive and statistically significant relation. These results suggest that wealth transfers are not the sole consequence of the spin-offs in my sample.

I next consider the effect of relaxing the assumption about the change in debt value in a more formal manner. I define ΔAV ≡dV/V as shown in the text as

[27] We rule out the pathological case that the value of the debt and equity will change in opposite directions in the absence of a wealth transfer.

$$\frac{dV}{V} = \left(\frac{dS}{S}\right)\left(\frac{S}{V}\right) + \left(\frac{dD}{D}\right)\left(\frac{D}{V}\right). \quad (3)$$

Suppose the following relation holds as suggested in the above paragraph, α dS = dD, where α can be either positive, negative or zero. That is, the change in the value of the debt is proportional to the change in the value of the equity. This simple relation captures the case where value creation or value destruction occurs for both the equity and the debt (that is, α >0). The relation can however, also capture the situation in which a wealth transfer occurs (that is α <0).

Under the assumption αdS = dD define $\left(\frac{dV}{V}\right)^*$ as

$$\begin{aligned}\Delta AV^* \equiv \left(\frac{dV}{V}\right)^* &= \left(\frac{dS}{S}\right)\left(\frac{S}{V}\right) + \left(\frac{dD}{D}\right)\left(\frac{D}{V}\right) \\ &= \left(\frac{dS}{S}\right)\left(\frac{S}{V}\right) + \left(\frac{\alpha dS}{D}\right)\left(\frac{D}{V}\right) \\ &= \left(\frac{dS}{V}\right) + \left(\frac{\alpha dS}{V}\right) \\ &= \left(\frac{dS}{V}\right)(1+\alpha) \\ &= \left[\left(\frac{dS}{S}\right)\left(\frac{S}{V}\right)\right](1+\alpha) = [\Delta AV](1+\alpha)\end{aligned} \quad (4)$$

Notice that the term in square brackets is the asset abnormal return, ΔAV, that I have used in the regression results presented in Table 2. I already know from these results that a positive and significant relation exists between ΔAV and the change in operating performance. The relation shown in (4) indicates that as long as α≠-1 (the pure wealth transfer case), ΔAV* will be nonzero as long as $\frac{dS}{S}$ is nonzero. If my assumption that the change in debt value is proportional to the change in equity value is reasonably accurate, then a positive and significant relation between ΔAV and the change in operating performance (as shown in Table 2), implies that even if some redistribution occurs, as long as it is not a one-for-one tradeoff, I should observe a positive and significant relation between ΔAV* and the change in operating performance. Hence, I can conclude that revaluations of companies involved in spin-offs are related to the change in operating performance of the surviving parent and the spun-off company. The relation implies that the regression results using

$$\Delta AV^* \equiv \left(\frac{dV}{V}\right)^* = \left[\left(\frac{dS}{S}\right)\left(\frac{S}{V}\right)\right](1+\alpha) = [\Delta AV](1+\alpha) \quad (5)$$

ΔAV*,except for the intercept, should be the same as those found using ΔAV as the dependent variable. I confirmed this by estimating regression models 3 and 6 shown in Table 2 for various levels of α in the range { -.75, 1}. Because these results are identical to those presented in Table 2, except for the intercept, I do not report them in the paper. The results for the case in which α = 0 are presented in Table 2 as previously discussed.

4.5.2 Implications of data restrictions and spin-off size

The sample examined in Table 2 satisfies the restriction that there must be at least two years of operating data for the parent company available on the COMPUSTAT files out of the three years immediately prior to the spin-off, and at least two years of operating data available for both the surviving parent and the spun-off unit out of the three years immediately following the spin-off year. I also examined a sample in which I required that three years of data before and after the spin-off be available. The size of the more restricted sample is 54. The results of these regressions are presented in Tables A1 and A2 of the Appendix. The results presented in Tables A1 and A2 are qualitatively the same as those presented in Tables 2 and 3. The results are not sensitive to whether I require two or three years of operating data before and after the spin-off.

I also estimated models including the size of the spun-off unit relative to the pre spin-off size of the parent as an additional independent explanatory variable. The estimated coefficient on the size variable was never significantly different from zero at conventional levels[28].

4.6 Sensitivity of the results to how the pre spin-off equity value increase of the parent is distributed between the surviving parent and the spun-off unit

The assumption that the entire pre spin-off increase in the equity value of the parent company can be attributed to an increase in the value of the surviving parent underlies the operating returns used in the regressions presented in Table 2. I tested how

[28] The p-values for tests that the coefficient on this variable was equal to zero were always in excess of .10. These results are available from the authors upon request.

sensitive the results are to this assumption by computing operating returns in two alternative ways, both of which attribute part of the pre spin-off increase in equity value to the surviving parent and part to the spun-off unit. In Section 4.3 I labeled these Assumption 2 and Assumption 3 respectively. Assumption 1 takes the extreme view and attributes all of the pre spin-off revaluation to a revaluation of the surviving parent company. Assumption 2 is that the split is proportional to the market values of the surviving parent and the spun-off unit immediately following the spin-off. Assumption 3 is that the spun-off unit is allocated twice the proportional contribution attributed to it under Assumption 2.

Table 5. Cross-sectional regression results: Cumulative and compound abnormal asset returns. Spinoff firm is allocated twice its proportional revaluation as a proportion of market values immediately after the spinoff; parent firm's revaluation is reduced by same amount

Coefficient estimates and summary statistics for regressions of cumulative and compound asset abnormal returns, ΔAV, on the industry-adjusted change in operating performance, and on a dummy variable indicating whether the parent and spun-off unit were not in the same line of business. The dependent variable, ΔAV, asset abnormal return, is equal to the equity abnormal return for the parent multiplied by the ratio of the parent's preannouncement total equity market value, S, to its pseudo-total market value, V. The implied assumption is that the percentage change in the value of the parent's debt at the spin-off announcement is typically zero. The variables ΔOPER is defined as the change in the firm's industry-adjusted average operating cash flow before depreciation, goodwill, interest expense and interest income from short-term investments, deflated by the company's pseudo-market value of assets. The variable SIC is defined as a dummy variable that takes the value 1 when the SIC codes of the parent and spun-off companies do not match at the one-digit level. Results are presented for cases in which at least two years of operating data prior to and after the spin-off. The sample size for all regression models presented in this table is n =69 (p-values for tests that the coefficients equal zero are reported in parentheses).

	Cumulative Abnormal Returns			Compound Abnormal Returns		
	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	0.023	-0.032	-0.024	0.038	-0.039	-0.029
	(.136)	(.194)	(.298)	(.066)	(.231)	(.345)
□OPER	0.386		0.362	0.489		0.454
	(.003)		(.003)	(.005)		(.006)
SIC		0.084	0.077		0.119	0.110
		(.009)	(.012)		(.006)	(.007)
Adj. R^2	.11	.08	.18	.10	.10	.18
F-statistic	9.75	7.20	8.67	8.65	8.22	8.63
(p-value)	(.003)	(.009)	(.001)	(.005)	(.006)	(.001)

Table 4 presents the results based upon Assumption 2 and Table 5 presents the results based upon Assumption 3. The results presented in these tables are qualitatively the same as those presented in Table 2. Abnormal revaluation, whether measured in terms of asset returns or equity returns, is positively related to abnormal operating performance, and the results are not sensitive to whether cumulative abnormal returns or compound abnormal returns are used as the dependent variable. The coefficients on the operating performance measures are always positive and significantly different from zero at conventional levels. The coefficient of the dummy variable SIC is also always positive and significantly different from zero at conventional levels. The overall results are therefore not sensitive to my alternative assumptions about how the pre spin-off increase in the equity value of the parent is divided between the surviving parent and the spun-off unit. Notice also that the adjusted R^2 values for the model results presented in Tables 4 and 5 are generally smaller than those presented in Table 2. This suggests to us that Assumption 1 is a reasonable approximation.

5 Conclusion

This study examines the relation between changes in industry-adjusted operating performance associated with a sample of corporate spin-offs and the market's assessment of the spin-offs as either value increasing or value decreasing activities. The sample consists of voluntary tax-free spin-offs that occurred between the years 1973 and 1995.

I measure the industry-adjusted operating performance of the pre-spin-off parent and of a post-spin-off portfolio of the new parent and the spun-off unit. I find that the average change in industry-adjusted operating returns for the sample is not significantly different from zero. However, I also present evidence suggesting that this average result is misleading because some spin-offs appear to be value

increasing while others are value decreasing. I document a positive and significant relation between the market's revaluation of the parents' assets and the change in the industry-adjusted operating performance of the companies involved. I also find a positive and significant effect on the market's revaluation of the parent's assets when the parent company and the unit spun-off operate in different lines of business. I examine the sensitivity of these results to numerous measurement issues and conclude that they are robust. I conclude that some spin-offs create value, especially those in which the unit spun-off operates in a line of business unrelated to the parent's main line of business. However, the evidence also suggests that many spin-offs destroy value as well.

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Appendix 1

Supplementary tables

Table A1. Cross-sectional regression results: Cumulative and compound abnormal asset returns

Coefficient estimates and summary statistics for regressions of cumulative and compound asset abnormal returns, ΔAV, on the industry-adjusted change in operating performance, and on a dummy variable indicating whether the parent and spun-off unit were not in the same line of business. The dependent variable, ΔAV, asset abnormal return, is equal to the equity abnormal return for the parent multiplied by the ratio of the parent's preannouncement total equity market value, S, to its pseudo-total market value, V. The implied assumption is that the percentage change in the value of the parent's debt at the spin-off announcement is typically zero. The variables ΔOPER is defined as the change in the firm's industry-adjusted average operating cash flow before depreciation, goodwill, interest expense and interest income from short-term investments, deflated by the company's pseudo-market value of assets. The variable SIC is defined as a dummy variable that takes the value 1 when the SIC codes of the parent and spun-off companies do not match at the one-digit level. Results are presented for cases in which at least three years of operating data prior to and after the spin-off. The sample size for all regression models presented in this table is n =54 (p-values for tests that the coefficients equal zero are reported in parentheses).

	Cumulative Abnormal Returns			Compound Abnormal Returns		
	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	0.020	-0.048	-0.029	0.030	-0.036	-0.019
	(.192)	(.046)	(.178)	(.148)	(.258)	(.548)
ΔOPER	0.562		0.521	0.478		0.431
	(.001)		(.001)	(.019)		(.028)
SIC		0.092	0.081		0.091	0.080
		(.004)	(.005)		(.030)	(.047)
Adj. R^2	.21	.13	.31	.09	.07	.14
F-statistic	15.13	8.96	13.05	6.03	5.01	5.27
(p-value)	(.001)	(.004)	(.001)	(.019)	(.030)	(.008)

Table A2. Cross-sectional regression results: Cumulative and compound abnormal equity returns

Coefficient estimates and summary statistics for regressions of cumulative and compound equity abnormal returns, on the industry-adjusted change in operating performance, and on a dummy variable indicating whether the parent and spun-off unit were not in the same line of business. The dependent variable is equal to the equity abnormal return for the parent. The variables ΔOPER is defined as the change in the firm's industry-adjusted average operating cash flow before depreciation, goodwill, interest expense and interest income from short-term investments, deflated by the company's pseudo-market value of assets. The variable SIC is defined as a dummy variable that takes the value 1 when the SIC codes of the parent and spun-off companies do not match at the one-digit level. Results are presented for cases in which at least three years of operating data prior to and after the spin-off. The sample size for all regression models presented in this table is n =54 (p-values for tests that the coefficients equal zero are reported in parentheses).

	Cumulative Abnormal Returns			Compound Abnormal Returns		
	(1)	(2)	(3)	(4)	(5)	(6)
Intercept	0.037	-0.054	-0.030	0.047	-0.041	-0.019
	(.062)	(.084)	(.286)	(.071)	(.298)	(.629)
ΔOPER	0.707		0.651	0.627		0.565
	(.001)		(.001)	(.013)		(.021)
SIC		0.125	0.111		0.122	0.108
		(.003)	(.003)		(.019)	(.031)
Adj. R^2	.20	.14	.31	.10	.08	.16
F-statistic	13.92	9.91	12.96	6.65	5.82	6.02
(p-value)	(.001)	(.003)	(.001)	(.013)	(.019)	(.005)