DOWNSCOPING VS. DOWNSCALING SPIN-OFFS: PARENT, SUBSIDIARY, AND PROFORMA PERFORMANCE

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ABSTRACT

In the diversification literature, the area of downscaling and/or downscoping restructuring strategies has been the subject of considerable research. While several empirical studies in this area have focused on spin-offs, most of these studies have concentrated on the performance of the divesting company, with little research addressing the performance of the divested unit. This study examined the performance of both the parent and the subsidiary firms, as well as a combined proforma performance, where the firms were involved in tax-free, equity spin-offs. Results suggest that when the spin-off occasioned a reduction in *scope* for the parent firm, both the parent firm and the spin-off subsidiary firm achieved performance improvements. However, when the spin-off only resulted in a reduction in *scale* for the parent firm, neither the firm nor the subsidiary achieved such improvements. A combined pro forma analysis also demonstrated that, when spin-offs are separated from parent firms, downscoping firms achieved better overall performance than downscaling firms. These results are only found when using an industry-adjusting matching-firm methodology that controls for trends in financial accounting performance data.

KEYWORDS: downscoping, restructuring, performance

INTRODUCTION

During the decade of the 1980s, and continuing into the late 1990s, substantial restructuring (in number, magnitude and widespread impact) among firms of various sizes took place (Bowman & Singh, 1993; Jensen, 1993; Johnson, 1996; Markides, 1992). The various types of restructuring these firms underwent included financial restructuring (e.g., leveraged buyouts, stock repurchase, recapitalization, equity carve-outs, etc.), organizational restructuring (e.g., internal reorganization, layoffs, etc.) and portfolio restructuring (e.g., mergers, asset acquisition/sale, spin-offs, etc.) (Bowman & Singh, 1993; Gibbs, 1993; Johnson, 1996). Our study centers on portfolio restructuring, focusing specifically on corporate refocusing or downscoping. Along with others (e.g., Hoskisson & Johnson, 1992; Hoskisson & Turk, 1990; Markides, 1992), Johnson (1996) argued that corporations use several methods to refocus, de-diversify or downscope, including split-ups, sell-offs and spin-offs, all of which "...are a subset of portfolio restructuring" (Johnson, 1996: 440). Split-ups occur when a firm divides itself into parts, with no remaining "parent" surviving, and tax implications remain. Sell-offs transpire when the divested assets are acquired and become part of another firm (Rosenfeld, 1984). Spin-offs occur when a corporation distributes on a pro-rata basis to its existing shareholders all of the stock relating to a controlled subsidiary, creating a new, individually publicly-traded corporation (Rosenfeld, 1984).

While several empirical studies have focused on downscaling and/or downscoping restructuring strategies relating to spin-offs, most have concentrated on the performance of the divesting company, with little research addressing the performance of the divested unit. The notable exception that did focus on the performance of the divested unit was the work by Woo, Willard and Daellenbach (1992). However, there has yet to be a comprehensive investigation within a single study that included the

performance of the divesting (parent) company, the divested (spin-off) unit and a proforma analysis that combined the performance of the parent and the spin-off. This research seeks to fill that void.

Although firms can downscope by discontinuing operations, selling unrelated assets to others, or spinning off unrelated divisions or subsidiaries (Hoskisson & Hitt, 1994), we focus our research on spin-offs because there are several inherent advantages in doing so. First, because sellers receive cash or equivalents in an asset sale, assets sales are frequently motivated by liquidity constraints or a need to reduce debt (John & Ofek, 1995; Lang, Poulsen & Stulz, 1995; Ofek, 1993; Shleifer & Vishny, 1991). Unlike the sale of assets, an equity spin-off does not involve exchange of any cash. Thus, a spin-off is not motivated by the firm's need to generate immediate cash. Second, an asset sale may occur if a buyer is willing to pay a high price (overpay), even though the seller may have no need or desire to dispose of the assets. This could happen when an asset buyer has a (presumably) better use for the assets or is willing to overpay for some reason such as excess free cash flows (Jensen, 1986). Research focusing on spin-offs is free from these confounding motivations. Third, when a spin-off from a publicly-traded firm occurs both the parent firm and the new spin-off trade on the public market as separate entities subsequent to the divestiture, overcoming an obvious limitation of discontinuing operations. Consequently, required public disclosure of financial information from the new spun-off entity is available, allowing for separate analysis of its autonomous performance. Finally, in a spin-off assets are not revalued, so assets have the same basis both pre- and post-spin-off, and accounting measures are therefore comparable across the two periods.

In our study, the performance of the parent firm, the spin-off unit and a proforma portfolio of the combined parent and spin-off are each separately measured. In addition, and consistent with the work of Woo et al.(1992), we extend the performance period beyond the time of announcement and examine

the change in performance from pre- to post-divestiture. As with previous spin-off studies focusing on parent firms, we find significant positive performance gains. However, in contrast to the work by Woo et al.(1992), we also find significant positive performance gains for the spin-off units. Further, we find significant positive performance gains for the combined proforma analysis, which we believe, as explained below, is the best measure of the value added to the stockholders of a firm pursuing a restructuring strategy using spin-offs. Finally, we find, also in contrast to Woo et al.'s (1992) study, that there is a difference in performance between firms that spin off units where the result is only a downscaling of the parent firm and firms that spin off units where the result is also a downscoping of the parent firm.

The balance of this paper is divided into six additional sections. The second section discusses prior theoretical and empirical research relating to restructuring through spin-offs. The third section describes how downscaling restructuring through spin-offs effects the performance of the divesting firm, the performance of the spin-off unit and the performance of a portfolio containing both the parent and spin-off firms, suggesting three related hypotheses. The fourth section discusses how downscoping restructuring through spin-offs effects the performance of the parent, spin-off and portfolio, offering three related hypotheses. The fifth section describes the sample, variables and methods used to test the six hypotheses. The results are presented in the sixth section. The seventh and final section presents a discussion of the results as well as implications of the results, including limitations of the study, and suggestions for future research.

PRIOR RESEARCH

Prior research has shown that market reaction to announcements of these methods of downscoping and/or downscaling divestment has generally been positive. For example, research by

Klein (1986), Jain (1985), Hearth and Zaima (1984), Montgomery, Thomas and Kamath (1984) and Alexander, Benson and Kampmeyer (1984) show that stockholders evaluate the announcements of subsidiary sell-offs as beneficial based on the significant and positive cumulative abnormal return (CAR) observed at the time of the announcement. In a similar manner, research relating to spin-offs by Rosenfeld (1984), Hite & Owers (1983), Miles & Rosenfeld (1983), and Schipper & Smith (1983) also indicate stockholder approval through significant and positive CARs. Many details of the studies mentioned above are reviewed in Woo et al. (1992).

Notwithstanding the extensive work described above regarding the positive effects of the announcements of spin-offs, little is understood regarding the sources of those gains. The preceding studies that focused on spin-offs, using event methodology and CAR as performance measures, generally did not discern within the market reaction the relative portion of the performance gains attributable to the parent, to the subsidiary, or a combination of both. And, although market reaction to announcements has been frequently used as a measure of expected performance, generally, studies using longer-term, realized performance measures relating to spin-offs have been absent from the literature. A noteworthy exception to this research vacuum is the work of Woo and her colleagues (1992) who focused their work on the performance of the spun-off unit, presenting hypotheses examining the changes in performance from a pre-divestiture period to a post-divestiture period. Woo et al.'s (1992) first hypothesis argued that the spin-off unit's performance would improve after separation from the parent firm. However, they found no significant positive performance gains for the spin-offs after divestiture across the four measures of performance employed (ROA, Market-to-Book, Capital Asset Pricing Alpha and sales growth). In fact, the only significant performance change they found for the spin-offs after divestiture was a negative ROA. Their second hypothesis was that the

positive performance gains of related spin-offs would exceed the gains of unrelated spin-offs. Again they found no support for this hypothesis, in that there were no significant differences in the performance improvements (or declines) between related and unrelated spin-offs.

Past empirical research has yet to indicate a positive relationship between divestitures and the performance of the spin-off unit. However, several theories suggest that downscoping and downscaling through spin-offs should affect performance in a positive manner.

DOWNSCALING AND SPIN-OFFS

Corporate downsizing or downscaling (Hoskisson & Hitt, 1994) includes the divestiture of businesses and/or the reduction in size of current businesses. Downscaling can affect firm performance through its effects on bureaucratic controls. That is, downscaling may reduce the level of formalized, bureaucratic controls used in a firm, and the reduction of such controls may, in turn, improve firm performance (e.g., Hitt, Hoskisson & Ireland, 1990). Bureaucratic controls refer to activities or mechanisms that formalize authority and reporting relationships so that procedures become standardized and produce expected behaviors (Hitt et al., 1990). Research in organization theory (Blau, 1970; Child, 1973) suggests that downscaling (becoming smaller) should be attended by decreasing vertical and/or horizontal differentiation, lower formalization and smaller administrative components for control purposes. For example, Mintzberg (1979) found that organizational size is generally positively related to formal behavioral controls. In addition, with fewer employees there is a reduced need for coordination among those employees (Blau, 1970). More recently, Sutton and D'Aunno (1989; 1992) argued that lower formalization and standardization will follow a reduction in organizational size, and that workforce reduction decreases the need for (and cost of) coordination and control. Decreases in these organizational characteristics occasioned by downscaling spin-offs can lead to a reduction in associated

costs, particularly related to monitoring, administrative control and coordination costs, which in turn would have a positive effect on firm performance. In addition, as a firm downscales through spin-offs, the attention of managers is shifted toward the remaining business units. The limitations of bounded rationality (Simon, 1976) are lessened as there are fewer units for managers to supervise. At the same time, fewer units would tend to reduce overall complexity and uncertainty. This suggests that downscaling through spin-offs can have a positive effect (through reduced bureaucratic controls and more focused managerial attention) on firm performance.

Beyond the effect of downscaling spin-offs on a firm's performance through bureaucratic controls as discussed above, downscaling spin-offs also may affect firm performance through its impact on innovation. That is, these types of spin-offs may increase innovation within a firm, and increased innovation may, in turn, increase firm performance. As a firm downscales, it may regain its flexibility and responsiveness to its environment (increasing its nimbleness) by reducing the inertia that so often accompanies overly large or complex organizations (Hannan & Freeman, 1984). Some of this inertia may be due to institutionalized expectations or rules (Mone, McKinley & Barker, 1998). As noted earlier, downscaling may lead to fewer rules (e.g., bureaucratic controls). A greater environmental responsiveness may lead to introduction of technological innovation at a faster rate (Collier, 1983). In addition, introduced innovation would complete its dissemination faster throughout an organization that has downscaled as a result of a spin-off. The faster the dissemination, the sooner the positive outcomes would appear. Further, a downscaled firm might be more likely to view new innovations as critical to its survival (particularly when lack of competitiveness was the initial motivation for the downscaling strategy) and be more motivated to conduct high-risk research which often leads to completely new processes and/or products (Mansfield, 1981). Moreover, downscaled firms may be less likely to

maintain a strong commitment to existing technology or less inclined (or able) to retard the development or implementation of new technology (Dougherty, 1979). Thus, increasing the amount of downscaling through spin-offs may establish a firm more solidly within a configuration more favorable to R&D investments (Link, 1978; 1980) and innovation outputs (Tassey, 1983).

A number of researchers have argued that a firm's competitive performance is related to its' ability to be innovative. For example, Hitt, Hoskisson and Harrison (1991) suggest that a strong managerial commitment to innovation is important for organizational competitiveness. Porter (1990) maintains that firms create competitive advantages through innovations (commercialized changes in product, process, distribution, etc.) which are an integral part of their strategic and competitive context. Porter further indicates that innovation (particularly technological innovation) has considerable power to change ". . .the competitive rules of the game. . .[and] is perhaps the single most important source of major market share change among competitors. . ." (1988: 213). This is consistent with Teece's (1986) arguments that not only is a dedicated effort toward innovative activities important to the financial health of the firm, but the proper targeting (e.g., allocation of R&D resources) of those innovative activities plays an important role in the organization's competitive performance. Finally, Merrifield (1989) contends that the innovations resulting from R&D activities are of overriding importance to industrial competitiveness, in that firm performance (e.g., market share, product quality) is directly proportional to increased investments in innovative activities.

Therefore, if innovation has a positive effect on firm performance, even in many low technology industries (e.g., Rubbermaid's performance as a result of its emphasis on innovations), and downscaling through spin-offs improves an organization's innovative ability by decreasing its inertia and increasing its flexibility and responsiveness, improved performance should be observed. In as much as spin-offs

reduce the size of the firm and, consequently, its level of complexity and overall uncertainty, while at the same time focusing managerial attention on the remaining business units and its innovative activities, it follows that:

H1: Firms that reduce their scale through spin-offs will improve performance.

Shifting focus from the parent firm to the spin-off unit, several factors suggest that the spin-off unit's performance will also improve after divestiture. These factors include reductions in agency costs and opportunities for new, advantageous external relationships. Reduction in agency costs between shareholders (owners) and managers (agents) has been suggested as an explanation for expected benefits of spin-offs (Woo et al, 1992). Agency costs emerge when one party (owners) delegates work to another (managers) in an environment where the parties differ in their goals and risk propensity and where it is costly to determine the contribution and consequences of the agent. Bonding costs and monitoring costs are examples of agency costs that are inherent in most principle/agent relationship. Bonding costs are borne by the agent to insure that the agent's behavior and actions are consistent with the goals of the principle and include the assumption of risk by the agent as well as the conflict incident to contradictory goals. In contrast, monitoring costs accrue to owners pursuant to their need to track and evaluate the activities of the agents. Monitoring costs can be in the form of incentive/compensation systems, budgeting tools, formal control systems and information collection/analysis. Woo and her colleagues (1992: 435) argue that a spin-off should reduce monitoring costs "…because performance of the spin-off unit would no longer be consolidated with that of other divisions or concealed beneath various corporate layers and arbitrary allocations." In addition, bonding costs would be reduced as a

spin-off pursues strategies more internally consistent and appropriate with its own market environment rather than be subjected to the interests of corporate managers (Woo et al, 1992).

In addition to the above arguments relating to agency theory, Schipper and Smith (1983) suggest that a spin-off unit separated from its parent organization may be better able to obtain more advantageous contracts/relationships with various entities (e.g., unions, government authorities) in its external environment. For example, a spin-off unit may benefit from less restrictive tax requirements or other obligations than its parent, especially if the parent and spin-off unit are under the regulations of different national governments (Schipper, 1983). In addition, labor contracts might not cross the separation created by the divestiture, allowing the new spin-off unit to form its own labor agreements. Further, spin-off units might not be bound by the same financial constraints as the parent organization. For example, a better bond rating (lower cost debt) might be available to the spin-off than was previously enjoyed by the parent. This could occur as financial markets judge the spin-off unit on its own merits without regard to other (possibly lower performing) units in the parent organization.

The above arguments suggest that gains in performance of spin-offs should be observed after divestiture. Thus, the following hypothesis:

H2: Spin-off subsidiaries will improve performance after divestiture.

In addition to individually examining the performance implications of spin-offs on both the parent firm and the subsidiary, it is important to understand the effect of the spin-off on the combined performance of both original and new entities. This is because the performance of the *portfolio* of the parent and the subsidiary represents a former single investment that now has two parts. While each part, as a portion of the former whole, can increase (decrease) its performance independently, whether or not

the restructuring was a success from the perspective of the stockholder does not just depend on how each individual part fares, but also on how the *combined portfolio* performs. Examining the parent or the spin-off independently may present an incomplete picture of the overall performance improvement (decline) of the portfolio and, thus, the success of the spin-off strategy. An inaccurate representation could occur as changes in performance of one entity are offset by counteracting changes in the other entity. For example, from a market value perspective, suppose the pre-divestiture stock value of the parent firm was $100 per share and the value of the spin-off unit was twenty (20%) percent of the parent firm. For an increase in performance of the original investment due to the restructuring to occur, either the stock value of the parent would have to exceed $80 per share or the stock value of the spin-off would have to exceed $20 per share (the other held constant), or both. However, if only the parent or the spin-off stock value is measured, the claim of an increase (decrease) in performance is suspect . This is because an increase in the parent firm's post-divestiture stock value might be neutralized (or more) by a subsequent decrease in the post-divestiture stock value of the spin-off. This suggests that, from the stockholders' position, performance related to spin-offs might be better studied from a combined (parent and subsidiary), proforma perspective.

Desai and Jain (1999 forthcoming) have explored the market performance implications of restructuring through spin-offs, focusing on the combined proforma performance of both the parent firm and the new spin-off unit. Their study used event methodology to understand market expectations regarding combined performance of spin-offs and parents at the time of announcement. They found the abnormal market returns were significant and positive not only over the announcement window but also over long-term holding periods (one, two, and three years). In this study, we examine the implications of long-term combined proforma performance using accounting data.

From the arguments above regarding expected increases in performance for the parent firm and for the spin-off unit as a result of separation, it follows that the combined performance of the two entities will improve ex-ante to ex-post. Thus, the following hypothesis:

H3: The combined proforma performance of parents and spin-off subsidiaries will improve after separation.

DOWNSCOPING AND SPIN-OFFS

The arguments presented above to support Hypotheses 1, 2, and 3 suggest that performance increases should be observed in the parent firm, the spin-off unit and the stockholders' portfolio positions in both when a firm downscales by restructuring through spin-offs. However, divestitures such as spin-offs also frequently result in *downscoping* the firm. Downscoping through divestiture of businesses unrelated to the primary or core businesses is often pursued in order to refocus on the essential elements of the parent business, improve efficiency (Hoskisson & Hitt, 1994) or performance. Spin-offs that also *downscope* an organization may provide performance improvements beyond those attributable to *downscaling* alone. Additional improvements could include increased efficiency and/or focus, appropriate course corrections, expectation of increased takeover activity or transfer of wealth from bondholders to stockholders. Improved efficiency and/or focus following downscoping spin-offs may result from improved managerial efficiency or improved allocation of resources. Spin-offs that reduce scope enhance managerial efficiency by reducing the diversity of assets under management. Williamson (1985) suggested that as the scope of business operations increases, a "depth-for-breath trade-off" occurs as the ability to knowledgeably allocate internal resources is reduced and problems of misallocation and opportunism increase. In addition, Hoskisson and Hitt (1994) argued that when firms exceed certain diversification limits, the organization suffers reduced performance due to ineffective

strategic control or overemphasis on financial controls that produce poor managerial decisions. Empirical evidence (Berger & Ofek, 1995) suggests that, from a market performance perspective, the stock of more diversified firms traded at higher discounts when compared to less diversified firms. Thus, de-diversifying (Johnson, 1996) or downscoping may have positive performance implications.

If divestitures occur without additional acquisitions, the level of diversification may change (Hoskisson & Hitt, 1994). In general, with all else held constant, when a parent firm spins-off a subsidiary that is relatively unrelated to its core operations, the parent firms reduces its overall diversification and becomes more related among the remaining divisions or operations. In contrast, when a parent firm spins-off a subsidiary that is more related to its core operations, the overall diversification level of the parent firm can increase (Hoskisson & Johnson, 1992).

Woo and colleagues (1992) suggested that spin-offs of related divisions (those spin-offs that would not reduce and could possibly increase the diversification of the parent) would provide greater improvements in performance than the spin-offs of unrelated subsidiaries (those spin-offs that would tend to reduce the scope of the parent). This position was based on Jones and Hill's (1988) argument that related firms faced higher bureaucratic or agency costs than unrelated organizations, which argument was, in turn, built on Thompson's (1967) model of task interdependencies. Jones and Hill (1988) argued that the relationships among the divisions of unrelated firms are characterized by pooled dependencies (more simple form), while related divisions are associated with sequential and reciprocal interdependencies (more complex form).

The centralization of decision-making consonant with the more complex sequential and reciprocal dependencies associated with related units may increase agency costs (monitoring costs) by diminishing the ability to discern the true contribution of individual divisions. However, the reduction in

agency costs expected by spinning-off the related subsidiary might be overwhelmed by an increase in other costs (or loss of benefits) associated with spinning-off the related unit. If the more complex interdependencies present in upstream-downstream transfers, resource sharing, joint decision-making and cross product considerations creates a situation where a division, because of its relatedness, is an important "cog" in the overall organizational operation, then the spin-off of that subsidiary might be detrimental to both the parent and the subsidiary. This could happen if the separation diminishes the synergies (due to the relatedness) previously realized. This is consistent with transaction cost theory (Williamson, 1981) that suggests internalization of functions that are critical or synergistic to the operation of the firm. When related units are spun off, and thus removed to an independent, market relationship, advantages of internal control and coordination as well as existing synergies are forfeited.

In contrast, although the reductions in agency costs due to spinning off unrelated divisions may be less, according to Jones and Hill (Jones & Hill, 1988) these costs were lower to begin with. While there may be less to be gained from the reduction of agency costs for unrelated spin-offs (Woo et al., 1992), the spin-off of unrelated subsidiaries (more characteristic of less complex, pooled interdependencies) would not occasion such a severe or costly disruption (due to loss of synergy, control, etc.) to the parent organization as compared to a related spin-off. Thus, although there are lower benefits available through agency costs reduction relating to the disruption of unrelated spin-offs, there are also lower costs.

Regarding the performance of unrelated spin-off units, such units, while within the parent firm, could have been hampered/stifled by having to coordinate with units with which they were not related to or by being subject to controls that were more suited to the needs of other, more related units. In addition, unrelated divisions within the parent firm would more likely have been subjected to financial

controls as opposed to strategic controls because of limited knowledge and lack of focus outside the core businesses on the part of the corporate office (Baysinger & Hoskisson, 1989). However, as independent units, unrelated spin-off subsidiaries would focus only on their own areas (related unto themselves) and be more likely to employ strategic, knowledge based controls that produce better performance (Hitt et al., 1990).

The same arguments regarding the performance of the parent firm when it spins-off a related subsidiary (loss of a related "cog" in its network.), would apply to the related spin-off units after separation. Before divestiture, related spin-offs typically would have been more integrated into the parent operations, strategies, etc. by virtue of their relatedness. However, after separation, as an independent unit the related spin-off no longer has the linkages or synergies that contributed to its previous level of performance. Thus, in contrast to unrelated spin-offs, related unit spin-offs would be expected to perform more poorly after separation.

The above arguments suggest that when spin-offs not only reduce the scale of the parent firm but also reduce the scope of the parent firm, the performance of the parent firm will improve beyond that attributable to downscaling activities alone. Thus, the spin off of unrelated units, which tend to increase the relatedness of the parent firm, can have an incrementally positive effect on the performance of the parent firm. In addition, the advantages of independence for unrelated spin-offs may be greater than the advantages of related spin-offs, suggesting that downscoping (for the parent) spin-offs should outperform spin-offs that do not downscope but only downscale the parent firm. Further, it follows that if downscoping spin-offs improve the performance of the parent and the divested spin-off unit over downscaling spin-offs, the proforma of the combined portfolio of the downscoped firm and the

subsidiary should perform above the level of the combined portfolio of spin-offs that only downscale the firm. The above arguments suggest the following three related hypotheses:

H4: Parent firms that reduce their scope through spin-offs will improve performance more than parent firm that only downscale through spin-offs.

H5: Spin-offs that result in downscoping the parent firm will improve performance more than spin-offs that result in only downscaling the parent firm.

H6: There will be a greater pre-separation to post-separation combined proforma performance improvement for parent firms and spin-offs that downscope the parent firm than for those that only downscale the parent firm.

METHODS

Definition of a Spin-off. A spin-off is defined as a pro-rata distribution of the shares of the subsidiary to the parent's shareholders, creating a new entity that trades independently from its former parent. A spin-off is tax free if it satisfies the following criteria set forth in Section 355 of the IRS code: (1) The distribution must constitute at least 80% of the outstanding shares of the subsidiary, and the shares retained by the parent should not constitute a "practical control" of the subsidiary; (2) both the parent and the subsidiary must be engaged in an active trade or business for at least five years prior to the ex-date; and (3) the transaction is done for sound business reasons and not as a means of avoiding taxes. Although we define the spin-off as above, many other forms of reorganizations are sometimes referred to as spin-offs in the popular press. They are split-ups, split-offs and equity carve-outs[1]. In this

[1] A split-up is a distribution of the shares of all of the subsidiaries that comprise the firm; thus the parent ceases to exist upon the completion of the transaction. In a split-off, parent's shareholders have to exchange the shares of the parent to obtain shares in the subsidiary. In an equity carve-out, the parent sells some of the shares of the subsidiary to the public, making a carve-out distinct from a spinoff as the parent receives cash in a carve-out. Also, unlike a spinoff, in a carve-out the parent usually retains a controlling interest in the subsidiary.

paper we study only tax-free spin-offs that are also "pure" spin-offs (100% of the outstanding shares of the subsidiary are distributed).

Sample Selection. The sample, covering the period from 1975 to 1991, was obtained from the Center for Research in Security Prices (CRSP) tapes, the Dow Jones News Service (DJNS) and the *Standard & Poor's Dividend Record*. The CRSP tapes were searched for the firms that have dividend distribution codes of 3763, 3764, and 3765 which are associated with spin-offs. The DJNS was searched for key words spin-off, spin-off and spin off, and the *Standard & Poor's Dividend Record* was examined for all stock dividends paid in other firms. Original articles in the *Wall Street Journal* (WSJ) were read to verify the announcement dates and the nature of the dividend. The initial sample consists of 246 parents and their 257 subsidiaries that are also available on the CRSP tapes. We then consulted the *Commerce Clearing House's Capital Changes Reporter* (CCR) to determine the tax status of the above distributions. We eliminated 30 spin-offs that were taxable and 9 spin-offs for which enough information was not available in the WSJ or the CCR to classify the transaction as a spin-off. In addition, 17 spin-offs were eliminated because they were either Royalty Trusts, Real Estate Investment Trusts or Limited Partnerships, as these types of spin-offs are frequently motivated by tax reasons. We also eliminated 8 cases where the subsidiary was trading prior to the spin-off date and eliminated 27 spin-offs where the parent stopped trading as of the ex-date because the spin-off was undertaken to facilitate the parent's merger with some other firm. Finally, we eliminated 29 spin-offs as the parents did not have necessary segment data either on the COMPUSTAT segment tapes (active and research) or in their annual reports (which were hand collected) to enable us to compute the entropy measure of diversification described below. Thus, our final sample consists of 126 parents that spun off 133 subsidiaries in tax-free transactions. Table 1 shows the distribution of these 133 spin-offs

over time. The parents were in 86 different industries at the 4-digit SIC level and 46 at the 2-digit SIC level. The subsidiaries were in 96 different 4-digit industries and 43 2-digit industries. Overall, between the parents and subsidiaries, 144 different 4-digit and 56 2-digit SIC level industries were represented in the sample.

Insert Table 1 about here

Dependent Variables. We use multiple measures of performance, including both accounting measures, return on assets (ROA) and return on sales (ROS), and a market measure, Tobin's *q*, the ratio of firm market value to the replacement cost of its assets. ROA was operationalized not only as net income divided by total assets but also as operating cash flow divided by total assets. ROS was also operationalized as both net income divided by total sales and as operating cash flow divided by total sales. We selected these measures because much prior strategic management research, including Woo, et al. (1992), has employed a measure of accounting returns, often ROA and/or ROS. In addition, the operationalizations involving operating cash flow, defined as total sales less cost of goods sold (COGS) and less selling, general, and administrative expenses, with any depreciation added back, were included because operating cash flow is more consistent between firms and is less likely to be affected by the use of different accounting methods. Further, the use of operating cash flow increases comparability with the research literatures in finance, which use these measures. Tobin's *q* was selected because some studies have found results to vary between accounting and economic measures (Hoskisson, Hitt, Johnson & Moesel, 1993) and also because of the use by Woo, et al. (1992) of Market-to-Book, a ratio that has been shown to be theoretically equivalent to Tobin's *q* (Varaiya, Kerin & Weeks, 1987) as well as empirically equivalent, with a correlation greater than 0.92 with all alternative operationalizations (Perfect & Wiles, 1992).

Downscoping versus downscaling. We use the Jacquemin-Berry entropy measure of diversification (Jacquemin & Berry, 1979; Palepu, 1985), which is defined as

$$\sum_{i=1}^{n} P_i \ln(1/P_i)$$

where P_i is the share of the *i*th segment in the total sales of the firm, which operates in *n* segments. A parent firm was classified as a downscoping firm if the spin-off reduced the firm's level of diversification (entropy), and a downscaling firm otherwise. Because of data availability issues with the COMPUSTAT segment data necessary for calculating the entropy measure, ten spin-offs had to be deleted from the sample for the analyses that used the entropy measure.

Related versus unrelated spin-offs. Because changes in the entropy measure could occur independent of downscoping and downscaling activities, we also used a second measure for robustness. We classified a spin-off as related if both the parent and subsidiary reported the same primary SIC code at the two-digit level. Related spin-offs would be associated with downscaling. If the parent and subsidiary operated in different two-digit SIC code industries, the spin-off was classified as unrelated. Unrelated spin-offs would be associated with downscoping. This is in contrast to Woo et al. (1992), who used judges to determine relatedness.

Timeframes. For pre-spin-off performance of parent firms and proforma combined firms, we use the means of the three years prior (years –3, –2, and –1) to the spin-off year (year 0). For pre-spin-off performance of the spin-off subsidiaries, because of data availability constraints we use the means of years –3, –2, –1, and 0 (including the spin-off year, which for 29% of the subsidiaries is the only year for which there is reported data). This is one additional year than Woo et al. (1992), who used years –2, –1, and 0 for their pre-spin-off period. For post-spin-off performance, we use the

means of the three years following (years 1, 2, and 3) the spin-off year (year 0) for parents, subsidiaries, and proforma combined firms, which is consistent with Woo et al. (1992).

Industry Benchmarking with Matching Firms. We control for potential industry specific factors in our performance measurements by reporting industry adjusted measures. We obtain an industry adjusted measure by comparing the performance of each sample firm to the performance of a single matching firm that is matched on size and industry at the 4-digit SIC level. Barber and Lyon (1996) have shown that the use of a matching control firm as a benchmark in the analysis of operating performance yields test statistics that are well-specified.

The matching firm is required to be available in both the CRSP and COMPUSTAT databases. The matching firm that is selected is the closest in size (market value of equity from CRSP) and that reports the same primary 4-digit SIC code as the sample firm in the month of the spin-off. We used the SIC codes from CRSP for industry classification because COMPUSTAT only reports the latest SIC code classification. Sample firms are not allowed to be matching firms for three years following spin-offs. If the matching firm should disappear (following a merger, for example), we replace its performance by the median performance of all firms in the same two-digit SIC industry. If the sample firm disappears in a given year, then the analysis is only performed up to that year.

To create the industry benchmarks for the analysis of the pro-forma combined firm in the post-spin-off period, we weight the performance of the parent's and the subsidiary's matching firms by the same weight used for the parent and subsidiary in the pro-forma measure. In the pre-spin-off period, when the parents and subsidiaries are single firms, we create a pro-forma industry benchmark using the relative values of total assets of the parents and the subsidiaries in the year of the spin-off (year 0) as weights.

Insert Tables 2, 3, and 4 about here

Tables 2, 3, and 4 show the intercorrelation matrices of the industry-adjusted study variables for the parent firms, subsidiaries (spin-offs), and the pro forma combined firms, respectively. Pre and post spin-off performance measures are all significantly correlated for all three groups, except for ROA_{NI} for the parents and for the pro forma combined firms.

RESULTS

To test the hypotheses stated earlier, we will employ the following conventions to depict performance:

P_{if} = industry-adjusted value of performance variable *i* for firm *f* in the time period prior to the spin-off event.

P^*_{if} = industry-adjusted value of performance variable *i* for firm *f* in the time period after the spin-off event.

The presentation of the tables and the following results are coordinated to address together those hypotheses related to the parent firm (H1 and H4), the spin-off (H2 and H5), and the proforma combined portfolio (H3 and H6).

The first hypothesis concerns the change in parent firm performance for all firms following the spin-off. This can be represented by H1: $\Delta P_i = E(P^*_{if} - P_{if}) > 0$. One-tailed paired t-tests were conducted to evaluate whether the expected values of the performance changes were significantly different from zero. The results (in the first sections of Tables 5 and 6) show that only return on assets (based on operating income) exhibited a statistically significant improvement, although return on sales (based on net income) showed a marginally significant improvement in both analyses. Note that all the

other accounting performance measures show improvement, but are not statistically significant. Tobin's *q* performance shows a decline, but again it is not statistically significant.

Insert Tables 5 and 6 about here

The fourth hypothesis contrasts the impact of the spin-off on downscoping parent firms versus downscaling parent firms. This can be represented by H4: $DP_{i(S)} > DP_{i(D)}$. The differences in performance changes are summarized in Tables 5 and 6. The second section of Table 5 shows that for both performance measures based on operating income, downscoping parent firms showed significant improvement, and that the measures based on net income also show improvement, but are not statistically significant. Tobin's *q* performance shows a decline, but again it is not statistically significant. For downscaling parent firms (shown in the third section of Table 5), return on sales based on net income shows statistically significant improvement, which is the only result that does not support H4. The second section of Table 6 shows that parents that spun-off unrelated subsidiaries show a statistically significant improvement in return on assets based on operating income and a marginally significant improvement in return on sales based on net income.

The second hypothesis concerns the change in subsidiary performance following the spin-off, represented by H2: $DP_i = E(P_{if}^* - P_{if}) > 0$. The results (in the first sections of Tables 7 and 8) show that while all measures show improvement, none are statistically significant.

Insert Tables 7 and 8 about here

The fifth hypothesis contrast the impact of the spin-off of subsidiaries undertaken to reduce scope versus the spin-off of subsidiaries undertaken to reduce scale, represented by H5: $DP_{i(S)} > DP_{i(D)}$. The second and third sections of Table 7 show that for both ROA measures subsidiaries of

downscoping firms showed improvements that were not statistically significant, and for both ROS measures showed marginally significant improvement, whereas the subsidiaries of downscaling firms showed insignificant improvement in ROA and an insignificant decline in both measures of ROS, yielding limited support for H5. Unrelated subsidiaries (the second section of Table 8) show non-significant improvements in all measures, whereas related subsidiaries (the third section of Table 8) show a non-significant decline in ROS based on operating income and non-significant improvements in the other three performance measures.

The third hypothesis concerns the change in pro forma combined performance following the spin-off. This can be represented by H3: $\Delta P_i = E(P_{if}^{*} - P_{if}) > 0$. The results based on the entropy measure (in the first section of Table 9) show that only return on assets (based on operating income) exhibited a statistically significant improvement, but that both ROS measures show a marginally significant improvement. ROA_{NI} also shows improvement, but it is not statistically significant. The results from the slightly larger sample based on 2-digit SIC codes (in the first section of Table 10) show marginally significant improvement for three out of the four measures and non-significant improvement in the fourth, again lending moderate support to H3.

Insert Tables 9 and 10 about here

The sixth and final hypothesis contrasts the overall impact of the spin-off on downscoping firms versus downscaling firms to see if the combined performance of the separated entities improves over that of the single entities. This can be represented by H6: $\Delta P_{i(S)} > \Delta P_{i(D)}$. The results in the second and third sections of Table 9 show that for both performance measures based on operating income as well as for ROS_{NI}, downscoping firms showed significant improvement, and that ROA_{NI} also shows

improvement, but is not statistically significant. For downscaling firms, all of the performance measures show a decline, but none are significantly different from zero. The results in the second and third sections of Table 10 show that ROA_{NI} shows statistically significant improvement for unrelated spin-offs, and marginally significant improvement for both measures of ROS, while none of the measures for related spin-offs are statistically significant.

DISCUSSION AND IMPLICATIONS

One question immediately arises: why did we find significant performance improvements for the parent firms and particularly for the spin-off subsidiaries of downscoping firms, when Woo et al.'s (1992) only statistically significant finding was declining ROA performance for all spin-offs and for unrelated spin-offs? This was particularly surprising given the probability that our sample includes a significant portion of their sample. A possible explanation lies in our use of an industry adjusting matching firm methodology. Barber and Lyon (1996) demonstrated that both the means and medians for ROA_{OI} decline over the period 1977 to 1992 for all industries in the COMPUSTAT database. Consequently, using raw unadjusted performance measures will likely lead to finding declining performance and a lack of significance due to poorly specified test statistics. Preliminary analyses of our raw data, similar to Woo et al. (1992), followed the same patterns. Barber and Lyon (1996) show that industry adjusting with matching firms yields the most well-specified test statistics. Our results show the same. It is possible that Woo et al. (1992) found significant negative performance for spin-offs because industry-level effects overshadowed the firm-level effects of the spin-offs. By adjusting for industry effects (using the matching firm methodology) we found that the spin-offs did not decline as much as

their industries (which all were in a general decline), thus improving their performance versus their industries.

Woo et al. (1992) also argued (but did not find) that related spin-offs would outperform unrelated spin-offs. We argued (and found) that unrelated spin-offs that tend to downscope the parent firm outperform related spin-offs that tend to only downscale the parent firm. This was found for both the parent firm and the spin-off, as well as for the combined portfolio. Although there is not strict comparability between our study and that of Woo et al. (1992), what is clear in these findings is that related spun-off subsidiaries (operating in the same 2-digit SIC code industries as their parents) did not experience performance improvements, nor did their parents. This is consistent with Bergh's (1995) findings in his study of sell-offs that parents selling related units have poorer performance than those selling unrelated units. This finding suggests that managers may need to consider the interdependencies among units when considering which units to divest through spin-offs.

Thus, a primary implication of the results of this study is that it appears to matter *what* is spun off. Spin-offs of subsidiaries in the same industry as the parent (or other subsidiaries) usually do not improve the performance of either the parent or the subsidiary, whereas spin-offs of subsidiaries in different industries improves both. It may be that the disruption of the interdependencies that exist between related units creates a cost to both the parent and the spin-off that more than offsets to benefit of reduced agency costs through higher visibility. The more complex the interdependencies, the greater the cost of the disruption of a spin-off. For example, severing a relationship based on a more complex sequential or reciprocal interdependency where there may be resource sharing or involvement in cross-product subsidies may be more costly than severing a less complex pooled interdependent relationship where units are contributing separately to the overall organizational process. Although the benefits of

reduced agency costs may increase as the relatedness of the spin-off to the parent increases as argued by Woo et al. (1992), these savings may be overwhelmed by the costs of disruption that increase at a faster rate as more complexly related units are spun off. If this is so, it follows that divesting related spin-offs (leading to downscaled parents) will result in lower performance than divesting unrelated spin-offs (leading to downscoped parents). The theory suggested by Woo et al. (1992) focused on the benefits (savings due to reduced agency costs) of spin-offs. The lack of significant results in their study may indicate that there are also costs (disruption of interdependencies) to be considered. When both costs and benefits are considered, unrelated spin-offs may outperform related spin-offs. This complete approach is consistent with the results found in this study, but additional research is suggested to further examine the relatedness issue.

Another implication of this study is that spin-off research may need to consider the performance effects accruing to the shareholder. In as much as the shareholder holds stock in both the parent and the subsidiary after divestiture, it is important to understand the effects of restructuring through spin-offs on both the parent and subsidiary. Thus, a combined portfolio perspective is important. Most previous studies have only examined the parents *or* the spin-offs in isolation. However, our results indicate that the performance improvements for the downscoping firms accrue to both parents *and* subsidiaries. Consequently, both (and the shareholders) are better off after a downscoping spin-off. On the other hand, the combined performance of the parent and the spin-off is headed in the negative direction (although lacking significance) for spin-offs that only downscale the parent firm.

Finally, interdependencies among units need to be examined prior to, during, and after a spin-off. Where the spun-off unit is in the value chain of the parent organization's processes could be important, and more research is needed to examine this issue. For example, when AT&T spun off

Lucent Technologies, the spin-off consisted of divisions and subsidiaries primarily at one end of the value chain (R&D), with fewer interdependencies than if AT&T had attempted to spin off its network support division which is more integrated with ongoing operations. Although Lucent would be considered by most to be related to the other units of AT&T, in this case a related spin-off may have focused AT&T even more.

The major limitation of this study is that the use of both COMPUSTAT and CRSP databases led to data availability problems that limited the size of the sample. While the sample was limited to 133 spin-offs, this is a relatively large number for a spin-off study. Most spin-off studies, including the recent work by Best, Best and Agapos (1998) and Daley, Mehrotra and Sivakumar (1997), end up with samples of fewer than 100 spin-offs. Woo et al. (1992) had a sample of only 51 spin-offs. Only Cusatis, Miles and Woolridge (1993), who had a sample of 146 spin-offs, Hite and Owers (1983), who had a sample of 123 spin-offs, and Desai and Jain (1999 forthcoming), who had a sample of 138 spin-offs, have sample sizes comparable to this study. Nevertheless, the modest sample size limits the statistical methods (and their power) that can be used in the analysis. Thus, ongoing research regarding this form of restructuring needs to continue in order to enrich and enlarge the sample by accumulating more recent observations.

Corporate spin-offs continue to occur, with 61, 132, and 73 spin-off announcements and/or articles in the *Wall Street Journal* during 1995, 1996, and 1997, respectively. As such, research regarding this form of restructuring requires ongoing attention by management scholars and managers alike. Interdependencies, relatedness, and holistic evaluation of expectations and outcomes all need to be considered by firms in researching, formulating, and implementing spin-offs.

Table 1. Distribution of spin-offs by year

Year	Number of spin-offs	Down-scoping spin-offs	Down-scaling spin-offs	Unrelated spin-offs	Related spin-offs
1977	2	1	0	2	0
1978	2	1	0	1	1
1979	7	6	1	5	2
1980	5	4	1	4	1
1981	12	9	2	9	3
1982	9	5	3	8	1
1983	7	5	2	6	1
1984	13	10	2	11	2
1985	13	10	3	11	2
1986	8	8	0	6	2
1987	11	7	3	6	5
1988	16	13	3	13	3
1989	13	10	2	8	5
1990	9	4	2	6	3
1991	6	5	1	5	1
Total	133	98	25	101	32

Table 2. Intercorrelation matrix of study variables (parents)

Variable	Mean	S.D.	Min.	Max.	1	2	3	4	5	6	7	8	9	10	11
1 ROA_{NI}	-0.0017	0.0636	-0.22	0.20											
2 ROA^{*}_{NI}	0.1346	1.2071	-0.36	12.71	0.049										
3 ROA_{OI}	0.0077	0.0942	-0.35	0.26	0.787•••	0.013									
4 ROA^{*}_{OI}	0.0316	0.1632	-0.43	0.92	0.326••	0.086	0.460•••								
5 ROS_{NI}	-0.0134	0.0817	-0.27	0.32	0.765•••	0.009	0.482•••	0.147							
6 ROS^{*}_{NI}	0.0007	0.1053	-0.35	0.46	0.291••	0.061	0.259••	0.439•••	0.308•••						
7 ROS_{OI}	-0.0061	0.1187	-0.34	0.37	0.423•••	-0.014	0.556•••	0.154	0.573•••	0.186•					
8 ROS^{*}_{OI}	0.0096	0.1508	-0.37	0.72	0.154	0.051	0.237•	0.452•••	0.241•	0.588•••	0.471•••				
9 Tobin's q	-0.3336	1.8113	-13.82	6.45	-0.128	-0.539•••	-0.096	-0.540•••	0.213•	0.061	0.048	-0.029			
10 Tobin's q*	-0.3438	1.4610	-10.24	1.84	0.032	-0.605•••	0.004	-0.587•••	0.171	-0.068	0.132	0.022	0.858•••		
11 Entropy	0.6609	0.4716	0	1.83	0.065	-0.036	0.010	0.098	-0.022	-0.044	-0.216•	-0.076	0.063	-0.004	
12 Entropy*	-0.0847	0.3669	-1.02	1.34	-0.019	-0.121	-0.035	-0.142	-0.076	-0.209•	-0.022	-0.238•	0.072	0.191	0.198•

Table 3. Intercorrelation matrix of study variables (spin-offs)

Variable	Mean	S.D.	Min.	Max.	1	2	3	4	5	6	7	8	9
1 ROA_{NI}	-0.0283	0.1949	-1.14	0.66									
2 ROA^{*}_{NI}	-0.0207	0.1838	-0.87	0.55	0.728•••								
3 ROA_{OI}	-0.0141	0.2195	-1.25	0.76	0.891•••	0.743•••							
4 ROA^{*}_{OI}	-0.0094	0.1891	-0.88	0.61	0.667•••	0.854•••	0.765•••						
5 ROS_{NI}	-0.0593	0.4134	-3.25	0.87	0.650•••	0.617•••	0.545•••	0.441•••					
6 ROS^{*}_{NI}	-0.0334	0.8736	-6.90	5.21	0.494•••	0.633•••	0.454•••	0.465•••	0.451•••				
7 ROS_{OI}	-0.0460	0.3893	-3.19	0.59	0.551•••	0.600•••	0.553•••	0.467•••	0.933•••	0.352•••			
8 ROS^{*}_{OI}	-0.0200	0.4937	-3.65	0.72	0.555•••	0.704•••	0.548•••	0.739•••	0.493•••	0.740•••	0.522•••		
9 Entropy	0.6677	0.4621	0	1.83	0.195•	0.177	0.181•	0.126	0.023	0.182	-0.054	-0.087	
10 Entropy*	-0.0873	0.3695	-1.02	1.34	-0.149	-0.133	-0.199•	-0.150	-0.079	-0.039	-0.098	-0.123	0.194•

Table 4. Intercorrelation matrix of study variables (proforma combined)

Variable	Mean	S.D.	Min.	Max.	1	2	3	4	5	6	7	8	9
1 ROA_{NI}	-0.0018	0.0556	-0.17	0.19									
2 ROA^{*}_{NI}	0.1233	1.1490	-0.35	11.68	0.042								
3 ROA_{OI}	0.0066	0.0845	-0.25	0.24	0.801•••	-0.011							
4 ROA^{*}_{OI}	0.0206	0.1229	-0.37	0.65	0.439•••	0.057	0.494•••						
5 ROS_{NI}	-0.0098	0.0675	-0.19	0.24	0.778•••	0.000	0.524•••	0.276••					
6 ROS^{*}_{NI}	0.0158	0.1846	-0.45	1.46	0.226•	0.034	0.164	0.342•••	0.272••				
7 ROS_{OI}	-0.0084	0.1134	-0.34	0.36	0.396•••	-0.023	0.553•••	0.204•	0.569•••	0.081			
8 ROS^{*}_{OI}	0.0084	0.1395	-0.52	0.77	0.295•••	0.041	0.306•••	0.523•••	0.499•••	0.450•••	0.517•••		
9 Entropy	0.6609	0.4716	0	1.83	-0.218•	-0.067	-0.146	-0.103	-0.144	-0.021	-0.066	-0.052	
10 Entropy*	-0.0847	0.3669	-1.02	1.34	0.151	0.045	0.171	0.109	0.094	0.023	0.063	-0.030	0.198•

••• is significant at the 0.001 level.
•• is significant at the 0.01 level.
• is significant at the 0.05 level.

Table 5. Differences in downscoping vs. downscaling parent firm performance over time

H1	All firms (n=116)	Return on Assets (Net Income)	Return on Assets (Operating Income)	Return on Sales (Net Income)	Return on Sales (Operating Income)	Tobin's *q*
	P_i	-0.0027 (0.0647)	0.0073 (0.0952)	-0.0117 (0.0815)	-0.0050 (0.1197)	-0.3417 (1.8114)
	P_i^*	0.1441 (1.2463)	0.0329 (0.1634)	0.0024 (0.1046)	0.0073 (0.1324)	-0.3426 (1.4613)
	$\Delta P_i = E(P_{if}^* - P_{if})$	0.1502 (1.2566)	0.0266•• (0.1452)	0.0141• (0.1126)	0.0142 (0.1164)	-0.0009 (0.5603)
H4	Downscoping firms (n=91)					
	$P_{i(S)}$	0.0030 (0.0573)	0.0102 (0.0845)	-0.0057 (0.0752)	-0.0085 (0.1156)	-0.3215 (1.6651)
	$P_{i(S)}$	0.1868 (1.4172)	0.0425 (0.1699)	0.0027 (0.1099)	0.0140 (0.1270)	-0.3884 (1.5505)
	$\Delta P_{i(S)}^*$	0.1862 (1.4251)	0.0316•• (0.1593)	0.0084 (0.1187)	0.0230•• (0.1229)	-0.0669 (0.3168)
	Downscaling firms (n=25)					
	$P_{i(D)}$	-0.0246 (0.0853)	-0.0034 (0.1300)	-0.0336 (0.1001)	0.0085 (0.1364)	-0.4184 (2.3355)
	$P_{i(D)}$	-0.0002 (0.0978)	0.0007 (0.1375)	0.0015 (0.0846)	-0.0154 (0.1497)	-0.1847 (1.1189)
	$\Delta P_{i(D)}^*$	0.0249 (0.0840)	0.0088 (0.0775)	0.0351•• (0.0859)	-0.0166 (0.0847)	0.2337 (0.9907)

Standard deviations shown in parentheses.
• significance level < 0.10
•• significance level < 0.05

Table 6. Differences in related vs. unrelated spin-off parent firm performance over time

H1	All firms (n=126)	Return on Assets (Net Income)	Return on Assets (Operating Income)	Return on Sales (Net Income)	Return on Sales (Operating Income)	Tobin's *q*
	P_i	-0.0017 (0.0636)	0.0077 (0.0942)	-0.0134 (0.0817)	-0.0030 (0.1197)	-0.3417 (1.8114)
	P_i^*	0.1346 (1.2071)	0.0316 (0.1632)	0.0007 (0.1053)	0.0080 (0.1486)	-0.3426 (1.4613)
	$\Delta P_i = E(P_{if}^* - P_{if})$	0.1422 (1.2517)	0.0281•• (0.1440)	0.0141• (0.1116)	0.0162 (0.1350)	-0.0009 (0.5603)
H4	Unrelated firms (n=95)					
	$P_{i(S)}$	-0.0030 (0.0658)	0.0012 (0.0990)	-0.0168 (0.0752)	-0.0207 (0.1145)	-0.3215 (1.6651)
	$P_{i(S)}$	0.1726 (1.3846)	0.0342 (0.1776)	0.0003 (0.1058)	-0.0037 (0.1482)	-0.3884 (1.5505)
	$\Delta P_{i(S)}^*$	0.1826 (1.3990)	0.0339•• (0.1602)	0.0172• (0.1206)	0.0184 (0.1487)	-0.0669 (0.3168)
	Related firms (n=31)					
	$P_{i(D)}$	0.0075 (0.0564)	0.0273 (0.0760)	-0.0029 (0.1001)	0.0329 (0.1022)	-0.4184 (2.3355)
	$P_{i(D)}$	0.0149 (0.0888)	0.0233 (0.1082)	0.0020 (0.0846)	0.0526 (0.1266)	-0.1847 (1.1189)
	$\Delta P_{i(D)}^*$	0.0131 (0.0734)	0.0092 (0.0690)	0.0049 (0.0859)	0.0207 (0.0749)	0.2337 (0.9907)

Standard deviations shown in parentheses.
• significance level < 0.10
•• significance level < 0.05

Table 7. Differences in downscoping vs. downscaling subsidiary firm performance over time

H2	All subsidiaries (n=123)	Return on Assets (Net Income)	Return on Assets (Operating Income)	Return on Sales (Net Income)	Return on Sales (Operating Income)
	P_i	-0.0326 (0.1959)	-0.0140 (0.2210)	-0.0643 (0.4273)	-0.0450 (0.4035)
	P_i^*	-0.0201 (0.1908)	-0.0039 (0.1940)	-0.0345 (0.9122)	-0.0153 (0.5139)
	$\Delta P_i = E(P_{if}^* - P_{if})$	0.0100 (0.1391)	0.0104 (0.1410)	0.0606 (0.7724)	0.0512 (0.4218)
H5	Subsidiaries of downscoping firms (n=98)				
	$P_{i(S)}$	-0.0044 (0.1609)	0.0210 (0.1722)	-0.0365 (0.3743)	-0.0228 (0.3787)
	$P_{i\,(S)}^*$	0.0063 (0.1582)	0.0221 (0.1619)	0.0769 (0.5721)	0.0474 (0.2878)
	$\Delta P_{i\,(S)}^*$	0.0080 (0.1427)	0.0007 (0.1343)	0.1093• (0.6907)	0.0680• (0.4308)
	Subsidiaries of downscaling firms (n=25)				
	$P_{i(D)}$	-0.1599 (0.2797)	-0.1557 (0.3238)	-0.2114 (0.6333)	-0.1478 (0.5005)
	$P_{i(D)}$	-0.1358 (0.2697)	-0.1126 (0.2713)	-0.5414 (1.7139)	-0.2900 (1.0023)
	$\Delta P_{i\,(D)}^*$	0.0197 (0.1237)	0.0508 (0.1633)	-0.2104 (1.1156)	-0.0299 (0.3751)

As noted in text, P_i includes year of spin-off (in this table only).
Standard deviations shown in parentheses.
• significance level < 0.10
•• significance level < 0.05

Table 8. Differences in related vs. unrelated spin-off subsidiary firm performance over time

H2	All subsidiaries (n=133)	Return on Assets (Net Income)	Return on Assets (Operating Income)	Return on Sales (Net Income)	Return on Sales (Operating Income)
	P_i	-0.0283 (0.1949)	-0.0141 (0.2195)	-0.0593 (0.4134)	-0.0460 (0.393)
	P_i^*	-0.0207 (0.1838)	-0.0094 (0.1891)	0.0240 (0.6269)	-0.0200 (0.4937)
	$DP_i = E(P_{if}^* - P_{if})$	0.0066 (0.1421)	0.0049 (0.1460)	0.0547 (0.7419)	0.0496 (0.4163)
H5	Unrelated subsidiaries (n=101)				
	$P_{i(S)}$	-0.0342 (0.1661)	-0.0147 (0.2107)	-0.0551 (0.3918)	-0.0660 (0.4364)
	$P_{i\ (S)}^*$	-0.0248 (0.1772)	-0.0105 (0.1714)	0.0196 (0.7008)	-0.0299 (0.4487)
	$DP_{i\ (S)}^*$	0.0055 (0.1416)	0.0038 (0.1370)	0.0543 (0.6994)	0.0355 (0.4137)
	Related subsidiaries (n=32)				
	$P_{i(D)}$	-0.0088 (0.2721)	0.0332 (0.2050)	-0.0030 (0.1395)	0.0096 (0.1614)
	$P_{i(D)}$	-0.0086 (0.2047)	0.0333 (0.1982)	0.0403 (0.1852)	0.1192 (0.3806)
	$DP_{i\ (D)}^*$	0.0100 (0.1463)	-0.0043 (0.2071)	0.0563 (0.2610)	0.1157 (0.4623)

As noted in text, P_i includes year of spin-off (in this table only).
Standard deviations shown in parentheses.
• significance level < 0.10
•• significance level < 0.05

Table 9. Differences in downscoping vs. downscaling pro forma combined firm performance

H3	All firms (n=116)	Return on Assets (Net Income)	Return on Assets (Operating Income)	Return on Sales (Net Income)	Return on Sales (Operating Income)
	P_i	-0.0035 (0.0559)	0.0050 (0.0856)	-0.0099 (0.0682)	-0.0084 (0.1156)
	P_i^*	0.1328 (1.1896)	0.0234 (0.1249)	0.0176 (0.1910)	0.0096 (0.1427)
	$\Delta P_i = E(P_{if}^* - P_{if})$	0.1398 (1.2006)	0.0194•• (0.1112)	0.0303• (0.1858)	0.0177• (0.1307)
H6	Downscoping firms (n=91)				
	$P_{i(S)}$	0.0018 (0.0502)	0.0079 (0.0804)	-0.0062 (0.0624)	-0.0138 (0.1152)
	$P_{i(S)}$	0.1781 (1.3410)	0.0361 (0.1238)	0.0335 (0.2040)	0.0160 (0.1409)
	$\Delta P_{i\ (S)}^*$	0.1794 (1.3496)	0.0292•• (0.1175)	0.0407•• (0.2006)	0.0283•• (0.1346)
	Downscaling firms (n=25)				
	$P_{i(D)}$	-0.0234 (0.0715)	-0.0058 (0.1045)	-0.0238 (0.0869)	0.0120 (0.1174)
	$P_{i(D)}$	-0.0313 (0.1128)	-0.0216 (0.1206)	-0.0391 (0.1225)	-0.0126 (0.1499)
	$\Delta P_{i\ (D)}^*$	-0.0089 (0.0894)	-0.0169 (0.0757)	-0.0080 (0.1107)	-0.0211 (0.1096)

Standard deviations shown in parentheses.
• significance level < 0.10
•• significance level < 0.05

Table 10. Differences in related vs. unrelated spin-off pro forma combined firm performance

H3	All firms (n=126)	Return on Assets (Net Income)	Return on Assets (Operating Income)	Return on Sales (Net Income)	Return on Sales (Operating Income)
	P_i	-0.0017	0.0077	-0.0134	-0.0030
		(0.0389)	(0.0942)	(0.0817)	(0.1197)
	P_i^*	0.1346	0.0316	0.0007	0.0080
		(1.2071)	(0.1632)	(0.1053)	(0.1486)
	$\Delta P_i = E(P_{if}^* - P_{if})$	0.1422	0.0281••	0.0141•	0.0162
		(1.2217)	(0.1440)	(0.1116)	(0.1350)
H6	Unrelated firms (n=91)				
	$P_{i(S)}$	-0.0047	0.0012	-0.0168	-0.0207
		(0.0658)	(0.0990)	(0.0815)	(0.1145)
	$P_{i(S)}$	0.1726	0.0342	0.0003	-0.0037
		(1.3846)	(0.1776)	(0.1058)	(0.1482)
	$\Delta P_{i\,(S)}^*$	0.1826	0.0339••	0.0172•	0.0184
		(1.3990)	(0.1602)	(0.1206)	(0.1487)
	Related firms (n=25)				
	$P_{i(D)}$	0.0075	0.0273	-0.0029	0.0329
		(0.0564)	(0.0760)	(0.0828)	(0.1022)
	$P_{i(D)}$	0.0149	0.0233	0.0020	0.0526
		(0.0888)	(0.1082)	(0.1054)	(0.1366)
	$\Delta P_{i\,(D)}^*$	0.0131	0.0092	0.0049	0.0207
		(0.0734)	(0.0690)	(0.0787)	(0.0749)

Standard deviations shown in parentheses.
• significance level < 0.10
•• significance level < 0.05

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