THE INFORMATION VALUE OF NEW DISAGGREGATED ACCOUNTING INFORMATION: THE CASE OF VOLUNTARY CORPORATE SPINOFFS

by

George Alfred Johnson

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APPROVED:

Robert M. Brown
Robert M. Brown, Chairperson

Floyd A. Beams
Floyd A. Beams

Craig D. Shoulders
Craig D. Shoulders

Thomas J. Hogan
Thomas J. Hogan

Marion R. Reynolds
Marion R. Reynolds, Jr.

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Committee Chairman: Robert M. Brown
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(ABSTRACT)

This dissertation is an empirical investigation of security excess returns associated with the announcement of corporate spinoffs. Spinoff excess returns exist, but the sources of these returns are not clear. Varying levels of disaggregated accounting information result from spinoffs. The purpose of this dissertation is to relate these information levels to spinoff excess returns.

A sample of 79 voluntary spinoffs from 1980 to 1987 is categorized according to levels of disaggregated accounting information. Analyses of the security returns for the entire sample and for the subsamples formed by information levels are performed. Additionally, the importance of the size of the spinoff and the combined impact of spinoff size and information levels are investigated. Daily excess returns from the CRSP Excess Returns File are the source of the dependent variable measure. Although the market reaction to spinoffs has been studied previously, the reaction to spinoffs from 1980 to 1987 has not been studied in detail.

The key findings and implications of the empirical investigation include:

1. Spinoff announcements do result in significant excess returns. This is a confirmation of similar findings from earlier investigations.
2. The size of the spinoff has a significant relationship to the announcement return. This is also a confirmation of results from earlier spinoff studies.
3. Levels of disaggregated accounting information are not significantly related to spinoff announcement returns. Another possible source of spinoff excess returns has been investigated.
4. Levels of disaggregated accounting information are related to the dispersion of spinoff announcement returns. The value of accounting information in a new setting is known.
5. Interaction between spinoff size and information levels is related to spinoff announcement returns. A qualification of the effect of size on spinoff excess returns is demonstrated.
6. Levels of disaggregated accounting information are related to spinoff postannouncement returns. This finding suggests postannouncement drift and a topic for further research.

In loving memory of

my father

Jaye Allan Johnson

and

father-in-law

Robert F. Sensel

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CHAPTER 1

INTRODUCTION

Corporate divestitures have received substantial attention in the popular press and in academic literature. Divestitures can generally be classified into one of three groups: (1) selloffs, (2) equity carveouts, and (3) spinoffs. In the case of selloffs the company sells a whole unit or division to an outside buyer. In an equity carveout a subsidiary is set up as a separately traded company whose shares the parent corporation sells to the public while usually retaining a controlling interest. Spinoffs divide one firm into two or more entities, and provide, in at least some instances, a new level of detailed, external accounting information. When a spinoff occurs the current shareholders "receive a pro-rata distribution of separate equity claims on a subset of the original firm's net assets" (Schipper & Smith, 1983, p. 437). Empirical study results reveal that shareholders of the divesting firm realize excess returns in all three types of divestitures.[1]

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[1] For a discussion of the results of these studies the interested reader should see Alexander, Benson, and Kampmeyer (1984), Boudreaux (1975), Hearth and Zaima (1986), Hite, Owers, and Rogers (1987), Jain (1985), Klein (1986), Rosenfeld (1984), Sicherman and Pettway (1987), and Zaima and Hearth (1985) for selloffs, and Schipper and Smith (1986) for equity carveouts.

1.1 RESEARCH PERSPECTIVE

Outside buying parties compensate the shareholders of a divesting firm in selloffs and equity carveouts. However, the parties owning the new divested subsidiary through a spinoff are the existing shareholders that neither receive nor pay compensation for the new shares issued. That is, both the pre- and post-spinoff owners are the same, and their investments remain in the same proportions. The spinoff owners simply have their original holdings divided into two or more parts. Thus, the market's response to spinoffs appears to be an anomaly. The focus of this study is an empirical investigation of this market response.

According to Schipper and Smith (1983, p. 441), there are three factors that simplify the estimation of the market response to spinoffs:

> First, continuity of ownership in a spinoff implies that any change in the total common equity value from this reorganization accrues to a single set of common shareholders. Second, because no sale occurs, the share price response to the initial announcement is not affected by expected asset purchase or selling price. Third, only one firm is involved in the decision to reorganize. Hence, news of the spinoff is less likely to leak in the capital market than in an inter-firm exchange.

The rationalizations offered for the observed excess returns from spinoffs include:

1. Regulatory or tax advantages (Schipper & Smith, 1983; Hite & Owers, 1983; Rosenfeld, 1984);

2. Wealth transfers from bondholders to shareholders (Schipper & Smith, 1983; Hite & Owers, 1983);
3. Improved managerial efficiency by reducing the dissimilarity of operations under the same management (Schipper & Smith, 1983; Hite & Owers, 1983; Rosenfeld, 1984);
4. Future merger activity is facilitated by the formal division of an existing entity (Hite & Owers, 1983); and
5. New information sources become available including publicly traded stock prices and separate financial statements for the spunoff unit(s) (Schipper & Smith, 1983; Rosenfeld, 1984).

There is little evidence to support the wealth transfer thesis (Schipper & Smith, 1983; Hite & Owers, 1983). However, there is some empirical evidence to support the regulatory or tax advantages argument, the improved managerial efficiency argument (Schipper & Smith, 1983; Hite & Owers, 1983), and the contention that spinoffs are sometimes carried out to facilitate mergers (Hite & Owers, 1983). In addition, two studies have provided empirical evidence that large spinoffs reflect disproportionate gains in relation to those for small spinoffs (Hite & Owers, 1983; Miles & Rosenfeld, 1983). However, no study has investigated the effects of new information empirically.[2] The purpose of this study is to relate information effects to excess returns for spinoffs.

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[2] Schipper and Smith (1983) assert that excess returns related to spinoffs remain largely unexplained.

1.2 BASIS FOR THE STUDY

Line of business (LOB) empirical research by Kinney (1971), Kochanek (1974), Simonds and Collins (1978), Ajinkya (1980), and others suggests that observed excess returns associated with LOB disclosures are related to the new disaggregated accounting information. More specifically, LOB researchers demonstrate that external financial reports containing segment data provide information useful to investors in appraising the investment potential of a diversified firm's stock (Kochanek, 1974). Also, Collins (1975) concludes that disclosure of segment revenue data allows abnormal returns to be earned. Therefore, in a non-spinoff setting, evidence of the relation between accounting information and excess returns exists.

Accounting information relating to spunoff units is available in varying degrees prior to the spinoff announcement. For example, in some situations pre-spinoff accounting information is not distinguishable for the spunoff entity; in others, minimal information required for LOB disclosures is available; and in still other instances, companies report information in excess of LOB reporting requirements. In the latter group, pre-spinoff accounting information does, on occasion, include complete financial statements. The basis for this examination then is the relation between accounting information and excess returns and the existence of unexplained excess returns for spinoffs having varying levels of accounting information available prior to the announcement.

The purpose of this research is to examine the extent to which the observed spinoff excess returns can be attributed to new levels of disaggregated information (LODI). In other words, this research uses a value of accounting information approach, similar to LOB research, to examine excess returns for spinoffs. It is expected that the largest excess returns will be observed for the spinoffs that generate relatively more new accounting information. Accordingly, spinoffs not generating new accounting information are not expected to have a security price reaction.

1.3 ORGANIZATION OF THE STUDY

The remainder of this dissertation is organized as follows. Chapter 2 provides a literature review separated between LOB and spinoff literature. Chapter 3 presents a detailed description of hypotheses, analytical methods, the sample, and event date specification. Data analysis and findings are described in Chapter 4. The final chapter summarizes the results, discusses contributions, suggests limitations, and presents concluding remarks.

CHAPTER 2

THE LITERATURE

Line of Business (LOB) reporting literature reviewed in this chapter provides evidence that segment information improves investor ability to appraise investment potential of a diversified firm's stock, improves the accuracy of consolidated earnings forecasts, increases consensus concerning the risk-return assessment of securities, and can allow abnormal returns to be earned. Spinoff literature shows that excess returns are associated with spinoff announcements and the reasons for these excess returns are largely unknown. Since new information is associated with a corporate spinoff, this research takes a value of accounting information approach to the examination of excess returns for spinoffs. Consequently, reviews of both LOB and spinoff research follow.

2.1 LINE OF BUSINESS REPORTING

2.1.1 Perspective

LOB reporting research is important to this study because it provides a logical basis for studying the spinoff excess returns anomaly.

In the late 1960s, LOB reporting began to have an impact on the required disclosures of publicly traded companies engaged in more than one area of economic activity. Arguments offered by proponents of LOB disclosures are reviewed in the manuscripts of several authors. Kinney (1971) observes that those who advocate reporting of LOB earnings data tend to argue that growth, profitability, and risk differ among segments of a company operating in substantially different industries. These factors complicate unnecessarily the prediction of consolidated earnings of a diversified company.

Kochanek (1974) theorized that segmented income statement and balance sheet data should permit the analyst-investor to analyze more precisely the component parts of the total firm leading to a more rational evaluation of a firm's stock. Two major needs for segmented profit data are provided by Horwitz and Kolodny (1977). They are:

1. Aggregate profit forecasts of the corporation will improve if disaggregated profit forecasts are available for segments having different growth rates.
2. Efficiency evaluation (stewardship) of the segments by the investor will improve operations of the entire corporation.

Other proponents of LOB reporting (e.g., Collins & Simonds, 1979) considered it important to provide investors with information useful in assessing the earnings potential and risk of firms involved in several divergent areas of economic activity.

In contrast, Collins (1975, 1976) suggests that revenue and profit figures by segments mislead investors due to inconsistencies across firms in defining segments, differences in inter-segment transfer pricing policies, and many arbitrary cost allocations. These factors, Collins argues, may limit the comparability of segment data across firms, and thus enable management to manipulate the profitability figures of segments.

The following paragraphs provide a brief chronological review of changes in LOB reporting requirements and reveal that proponents of LOB reporting have achieved relative success influencing changes that increase required segment disclosures.

2.1.2 Changes in LOB Reporting Requirements

Before 1969, very little segment data were publicly available because financial disclosures of segment information were voluntary. The SEC's registration statement, or Form 1, was the only statement that required any segment data. Beginning in 1969, Securities and Exchange Commission (SEC) releases 4988 and 8650 required issuers of new securities to report earnings for product lines (Kinney, 1971).

The endorsement of LOB disclosures by the Wheat Commission sparked the SEC to expand LOB requirements to include <u>all</u> registrants. Release 34-9000 requires all offerers of publicly traded securities engaged in more than one line of business, to report sales and profits before taxes and extraordinary items by product line in their annual 10-K reports (Collins, 1976). This release became effective for fiscal years ending on or after December 31, 1970.

Generally accepted accounting principles for segment disclosures have followed SEC initiatives. In 1976, the Financial Accounting Standards Board issued Statement of Financial Accounting Standards #14 requiring diversified firms to disclose segment information by lines of business, domestic versus foreign markets, and major customers. This statement became effective for fiscal year reporting after December 15, 1976.

2.1.3 Studies in LOB Reporting

The research efforts that focus on LOB fall into three different, although not perfectly separable, approaches. The first group of studies examines the predictive value of aggregated versus disaggregated firm data. A second group of studies focuses primarily on security price reactions to changes in LOB reporting requirements. The third group includes LOB studies that have the principal objective of testing whether LOB reporting impacts firm market risk.

2.1.3.1 Aggregate Versus Disaggregate Data

Kinney (1971) investigated the relative predictive power of subentity earnings data to determine if disaggregation of consolidated earnings permits improved predictions of a firm's future aggregate earnings. In his investigation, Kinney used four prediction models with data from a sample of 24 firms that voluntarily reported subentity data in 1967. He attempted to predict total consolidated earnings for 1968 and 1969 using 1967 and 1968 data as the primary sources of information. Two of his prediction models used consolidated earnings as a basis for prediction and two used subentity data. Kinney concluded that, even with his limited data, predictions of consolidated earnings based on segment sales and earnings are, on the average, more accurate than predictions using consolidated data only. That is, they have statistically significant smaller average absolute prediction errors.

In 1976, Collins updated Kinney's work using data disclosed under the LOB reporting requirements imposed by the SEC in 1970. Collins' sample included 96 randomly selected, multi-segment firms that did not disclose segment earnings data prior to 1970 in published reports available to the public, but did disclose segment earnings in 10-K reports for 1970 as required. He used prediction models with consolidated data that have theoretical support, and segment-based prediction models that attempt to replicate analysts' use of segment information in earnings estimation. Collins' consolidated data models were selected from the literature that investigates the time series properties of accounting income. In all, he used six different consolidated-based forecasting models. His segment-based models were very similar to those used by Kinney (1971), and his results suggest that segment data do have predictive usefulness.

An important new observation made by Collins is that segment profit information adds only "nominal" incremental improvement, once segment revenue data are considered.

The final study in this first group of studies evaluated whether fineness of disclosure (segment data) had an impact on investor consensus regarding the risk-return assessment of securities at the aggregate level for multi-segment firms. Specifically, Ajinkya (1980) studied the changes in degree of consensus at the aggregate level resulting from the SEC's mandatory LOB disclosure policies. Using a total of 172 firms in four subgroups, Ajinkya tested the hypothesis that the covariance of returns structure among the subgroups will show higher between group correlation after the SEC's change in reporting requirements. In other words, did market participants reevaluate risk-return characteristics of conglomerate firms that did not report data by LOB between 1966 and 1970? Ajinkya's groupings were as follows:

> Test Groups
>
> *Group 1* consisted of 56 firms that did not publicly disclose segment revenues or earnings in the 1966-1970 period; i.e., prior to the SEC, 10-K LOB requirements.
>
> *Group 2* consisted of 52 firms that reported segment revenues before 1970.
>
> Control Groups
>
> *Group 3* was composed of 35 firms that voluntarily disclosed segment revenue and earnings data before 1970.

Group 4 consisted of 29 single product firms.

Using a test of the homogeneity of covariance matrices Ajinkya provides evidence of increased consensus between the test and control groups in the period after the SEC's reporting requirement changes. This suggests that uniformity and greater fineness of disclosure for multi-segment firms do appear to increase the correlation in risk-return assessments of securities; i.e., segment disclosure does make a difference.

2.1.3.2 Shareholder Wealth Effects

Security price reactions to LOB reporting requirements are the focus of studies by Kochanek (1974) and Collins (1975).

Kochanek (1974) hypothesized that firms disclosing segment data reduce investor uncertainty, allowing better earnings predictions which in turn leads to less variable stock prices. He classified 37 firms as either superior (6 firms), good (18 firms), or poor (13 firms) segment reporters in the years 1967-1970. He checked the correlation between changes in earnings per share (EPS) and changes in stock prices. Kochanek asserted that superior segment reporters should have the highest correlation between EPS and stock price changes because "segment data should enable the analyst-investor to analyze more precisely the component parts of the total firm, and thereby evaluate the firm's stock on a more rational basis" (p. 245). Though not conclusive, his findings tend to support the position that external financial reports containing segment data do provide a source of information useful to investors in appraising the investment potential of a diversified firm's stock. More specifically, Kochanek's (1974, p. 254) results suggest that segmented information aids investors in anticipating future earnings changes over long and intermediate time periods. However, his results fail to demonstrate that "superior" segment reporters help investors anticipate future earnings more than "good" segment reporters. Also, he could not show that segmented information helps investors in shorter time periods.

Using the 1967-1969 comparative segment revenue and profit data reported in 10-K reports for 1970, Collins (1975) assessed the efficiency of the market with respect to this previously undisclosed segment information. He developed trading rule strategies allowing him to ask if investors can forecast firm earnings with the aid of non-public historical segment data, placing them in a portfolio position, prior to the issuance of annual reports, that allows abnormal returns to be earned. To elaborate, Collins' strategies (pp. 130-131) were, (a) to buy stock of those firms for which segment based earnings forecasts exceeded consolidated based earnings forecasts (i.e., segment based forecasts anticipate good news), and (b) to sell short the stock of those firms whose segment based earnings forecasts were lower than consolidated based forecasts (i.e., segment based forecasts anticipate bad news). Collins used the standard market model to measure abnormal returns for 1968, 1969, and 1970 for 92 multi-segment, randomly selected, New York Stock Exchange firms. The abnormal returns were conditional on the segment-based strategies. He divided his sample into one group that reported segment revenue data for the years 1967-1970 (57 firms) and one group that did not report segment data prior to 1970 (35 firms). His trading rule strategies perform "substantially" better for the latter group leading him to conclude that disclosure of segment revenue data can allow abnormal returns to be earned. In other words, "the results suggest that investors were able to utilize this segment revenue data to anticipate, to a large extent, changes in earnings which otherwise would have been unexpected" (p. 156).

2.1.3.3 Systematic Risk and LOB Reporting

The primary focus of the last group of studies concerns the impact of LOB reporting on a firm's market risk or Beta. Four key studies have this focus.

Horwitz and Kolodny (H-K) (1977) investigated changes in perceived risk characteristics of firms when previously undisclosed segment information became public. H-K compared two 50-firm samples: a treatment group consisting of firms required to report LOB data for the first time in 1971, and a control group of firms that reported 1971 information to the SEC on a consolidated basis only. Using a pre- and post-regression line approach, with market risk as the slope coefficient, they did not find evidence that LOB disclosure information leads to changes in Beta. H-K also examined security price and return changes using the standard market model methodology in a monthly returns context. They found no evidence of excess returns for the LOB group.

Simonds and Collins (S-C) (1978) questioned the conclusions (results) of H-K on the basis of sample selection procedures and methodology. Regarding the former, S-C found that a number of H-K's treatment firms had previously disclosed segment data in registration statements and proxy materials such that their results were biased against finding shifts in market risk. Regarding the latter, S-C objected to the H-K test statistic, stating that its "power" was quite low. S-C used more exact sampling procedures and statistical tests that reduce the standard error of Beta by combining firm securities into portfolios. Their study utilized a 215 firm sample divided into 3 groups. Group 1 with 78 firms had no, or limited, segment disclosures prior to the SEC's LOB requirement for 1970 10-K reports. The 70 firms in Group 2, the control group, did report segment profit data before being required to do so, and the 67 firms in Group 3 were not multi-segment firms. All firms in their sample had monthly returns on the Center for Research in Security Prices (CRSP) tapes from October, 1965, through 1974. Furthermore, the firms were classified by SIC industry codes. The results suggest that S-C's groups are reasonably comparable in terms of industry classification.

To test for shifts in Beta, S-C used analysis of covariance (ANCOVA) which provides an exact F-test, often referred to as the Chow test, of the equality of Beta coefficients. S-C calculated moving Beta estimates using the market model and treating each of the three aforementioned groups as a portfolio. The S-C results strongly suggest that the multi-segment group portfolio experienced a statistically significant downward shift in Beta (below .05 level of significance), while neither of the other two portfolios came close to experiencing a shift. In other words, the S-C results suggest LOB reporting does convey useful information to investors for assessing the market riskiness of multi-segment firms.

In a follow-up investigation, Collins and Simonds (1979) used the same firm sample and groupings to demonstrate detailed methodological procedures useful for detecting a shift in market betas. The conclusions were similar to those of the 1978 study whose primary purpose was to question the conclusions of Horwitz and Kolodny (1977).

Two important observations from this later study seem to provide a theoretical link to the results of Kochanek (1974). The first observation is quoted from Kochanek (1974, p. 247):

> . . . if segmental disclosure does provide a more objective basis for evaluating the future earnings performance of a diversified firm and thereby, currently valuing the firm's stock in line with these expectations, then stock price fluctuations should be lessened, and therefore price dispersion should be narrowed over time.

A second observation relates the preceding to the Collins and Simonds "Beta" findings (1979, p. 381):

> We might argue (then) that the observed decline in Beta, on average, is a consequence of improvements in earnings forecastability which results from LOB data and a reflection of reduced investor uncertainty about the future prospects of multi-segment firms.

Though not empirically verified, these observations provide a logic for many of the LOB research investigations.

Prodhan (1986) conducted the last LOB study that is reviewed here. His investigation tests whether geographical disclosure of segment information has any impact on the systematic risk profile of multinational enterprises. Unique to this study is the use of United Kingdom based companies, tests of reactions to FASB #14 type disclosure requirements, the nondependence on traditional cumulative average residual (CAR) methodology, and demonstration of the appropriateness of an interrupted time series analysis methodology. Analysis of monthly returns from June, 1973 to June, 1982 for 36 firms allowed Prodhan to conclude that changes in geographical segmental disclosure practices and changes in company systematic risk are likely to be associated. Furthermore, Prodhan shows that changes in risk are abrupt (not gradual), providing evidence of market efficiency in the semi-strong sense.

2.2 SPINOFF RESEARCH

2.2.1 Perspective

The empirical research related to spinoffs focuses largely on establishing the existence of excess security returns related to such divestitures. In contrast, LOB research attempts to show that observed excess security returns are related to disaggregated accounting information. The goal of this dissertation is to relate observed excess returns associated with spinoffs to the levels of disaggregated information (LODI) resulting from the spinoff; thus, this research takes a LOB research approach to spinoff events.

2.2.2 Studies Related to Spinoffs

Schipper and Smith (S-S)(1983) examined shareholder returns of 93 firms involved in voluntary corporate spinoffs from 1963-1981. They report that shareholders earn a statistically significant (at the .01 level) excess return over the two-day period (t=-1,0) around the spinoff event. Negative returns were observed over the 89-day period preceding the event (t=-90 through -2), and over the 40-day period after the event (t=+1 through +40), but these negative returns were not significantly different from zero. S-S examined three possible reasons for the existence of the observed excess returns over the two-day event period: a possible wealth transfer from bondholders, regulatory or tax advantages, and improved managerial efficiency. The wealth transfer thesis was explored by examination of bond price and rating behavior around the spinoff announcement, examination of restrictive debt covenants, and comparisons of the debt ratios of spunoff units to those of the pre-spinoff entity. Little evidence to support this thesis was found.

Eighteen of the 93 sample firms stated loosened regulatory environments or corporate tax advantages as motivating their spinoffs. The excess returns for the firms in this subsample were found to exceed those of the entire sample over the two-day period (t=-1,0) around the spinoff event. S-S note, however, that this factor alone does not begin to explain the total gains for the entire sample (p. 455).

S-S explored the improved managerial efficiency thesis by examining average growth of the pre-spinoff entity for five years prior to the spinoff and the dissimilarity of the operations of the spunoff unit and parent. Very large growth rates of the firms spinning off segments and differences in industrial classifications of spinoff entities versus their parents seem to support the view that spinoffs are undertaken to increase management efficiency.

Hite and Owers (1983) also investigated shareholder returns for voluntary corporate spinoffs. For their sample of 123 spinoffs announced between 1963 and 1981, they found that shareholders earned 3.3% over the two-day period (t=-1, 0) around the event. This supports the Schipper and Smith findings. In attempting to explain these excess returns, Hite and Owers found a size effect. They partitioned the sample into large (greater than 6.6% of the equity value spunoff) and small spinoffs. A 5.5% excess return over the two-day period around the event was identified for the large group (58 spinoffs) versus an .8% excess return for the small group.

Also explored by Hite and Owers was the possibility of wealth transfers from bondholders, and the rationale given by the divesting firm for the spinoff. As reported by Schipper and Smith, no evidence surfaced to support the wealth transfer thesis. However, some evidence was provided to suggest that (a) positive gains exist for firms spinning off units to facilitate mergers (12 firms), and (b) negative gains exist for firms spinning off segments for legal and regulatory purposes (19 firms).

A third empirical study of the effects of voluntary spinoff announcements was undertaken by Miles and Rosenfeld (1983). An initial sample of 92 firms whose parent companies had spunoff subsidiaries from January, 1963 to December, 1980 was reduced to exclude involuntary spinoffs, and those whose parent company stock was not traded on the New York or American Stock Exchanges. The resulting investigation included 55 firms, each having one spinoff.

Using an excess returns methodology, the authors report results similar to those of the preceding two studies. Specifically, they document excess returns of 3.3% over the two-day announcement period. Miles and Rosenfeld also explored the impact of the spinoff unit's size. They divided their sample into large and small spinoffs, defining large as a spinoff segment greater than 10% of the original equity value. Results of the size investigation revealed a statistically significant (at the .05 level) differential of 20.7% over the full 181-day observation period (t=-120 to t=+60).

Rosenfeld (1984) compared corporate selloffs to spinoffs. His sample of 35 spinoffs and 62 selloffs covered the 1963 to 1981 time period. Empirical evidence of the excess returns related to spinoffs was again substantiated. Rosenfeld suggests that the creation of a new publicly traded firm via a spinoff results in (1984, p. 1439):

> . . . new information sources which enable shareholders to more closely monitor the activities of managers, thereby reducing agency costs and enhancing shareholder wealth.

This particular observation is not empirically investigated.

Davidson and McDonald (1987) provide evidence of large abnormal returns for spinoffs of royalty trusts. In a natural resources context, a royalty trust is a trust formed as an ongoing entity consisting entirely of nonoperating mineral interests. These authors examined the returns of a sample of 11 of these specialized spinoffs, but could not distinguish whether the positive returns observed were due to the spinoff or tax advantages. Tax advantages existed because earnings of a royalty trust could be transferred tax free to the unitholders of the trust.

Denning (1988) categorizes sales of assets according to company motivations for the divestiture. His study includes return information for 42 spinoffs from 1970 to 1982 not categorized by motivations for the divestiture. Denning reports a 2.7% cumulative mean return for these 42 spinoffs. However, this mean return relates to a 13-day announcement period defined as $t=-6$ through $t=+6$, where $t=0$ is the announcement date. Use of this announcement period by Denning limits comparisons to other spinoff studies.

Using weekly returns for 39 spinoffs from 1972 to 1981, Kudla and McInish (1988) attempt to explain spinoff excess returns by relating them to differences of opinion between owners and nonowners concerning the value of parent company and spunoff firms. Kudla and McInish claim to establish this relationship using regression analysis. However, use of a dependent variable, cumulative returns measure covering a 22-week period in their regressions limits the usefulness of their results. Also, their use of weekly returns data makes comparisons to spinoff studies using daily returns very cumbersome.

Non-empirical or case study publications related to spinoffs are those by Chen and Merville (1986), Hoffman (1986), Alexander, Benson, and Gunderson (1986), Friedman (1987), Andrews (1987), and Woo, Willard, and Beckstead (1989). Chen and Merville examine divestiture effects pertaining to deregulation using the nonvoluntary breakup of AT&T as the basis for analysis. Hoffman discusses tax-planning issues in relation to AT&T divestitures. A detailed examination of responses to a variety of announcements specific to the spinoff of TWA by Trans World Corporation is the focus of a case study by Alexander, Benson, and Gunderson. Friedman discusses why spinoffs, split-offs, and split-ups remain tax favored in spite of the Tax Reform Act of 1986. He points out that Internal Revenue Code Section 355 remains one of the best ways to achieve a tax-free reorganization, and discusses in detail how to meet the requirements of this Section. Andrews outlines the administrative steps a corporation should follow in executing a spinoff. His article, which is directed primarily to corporate executives, discusses the many issues that must be considered in restructuring via a spinoff. Finally, Woo, Willard, and Beckstead discuss factors parent companies should consider before undertaking spinoffs.

2.3 Literature Focus

Two research streams are reviewed in this chapter. The first, LOB reporting research, provides the logical basis for this dissertation; i.e., evidence of the relationship between accounting information and excess returns. Most relevant to this dissertation is LOB empirical research by Kinney (1971), Kochanek (1974), Simonds and Collins (1978), and Ajinkya (1980). Their studies suggest that observed excess returns associated with LOB disclosures are related to the new LODI. They also demonstrate that segment information improves the accuracy of consolidated earnings forecasts and increases consensus concerning the risk-return assessment of securities. The second research stream, spinoff investigations, provides the object of study; i.e., spinoff excess returns. Spinoff empirical research by Schipper and Smith (1983), Miles and Rosenfeld (1983), Hite and Owers (1983), and others documents the existence of spinoff excess returns. Furthermore, Rosenfeld (1984) suggests that new information sources resulting from spinoffs may benefit shareholders.

Different LODI result from spinoffs. This dissertation examines the relationship between these different LODI and spinoff excess returns.

CHAPTER 3

HYPOTHESIS FORMULATION, METHODOLOGY, AND SAMPLE SELECTION

3.1 HYPOTHESIS FORMULATION

The preceding review of the literature demonstrates two findings:

1. Empirical evidence suggests that LOB disclosures produce positive excess returns for shareholders and can induce changes in the investor's risk assessment of the reporting firm.
2. Empirical studies of the sources of excess returns for shareholders of firms spinning off units have not fully explained the shareholder gains. A possible, but as yet untested, source of such gains is the additional information that results from a need to prepare separate accounting statements for the spunoff unit.

The purpose of this research is to examine empirically the role of levels of disaggregated information (LODI) in explaining the shareholder excess returns from spinoffs.

3.1.1 Confirmatory Hypotheses

Confirmatory hypotheses to be examined from this study's sample of spinoffs are:

Hypothesis 1 ($H1_0$):

The announcement of corporate spinoffs is not related to excess security returns.

Hypothesis 2 ($H2_0$):

Security excess returns of parent firms spinning off segments are not related to the relative size of the segments spunoff.

Examination of the preceding two hypotheses is necessary to confirm that characteristics of this study's spinoff sample are similar to characteristics of spinoff samples examined in prior studies.

3.1.2 Primary Hypotheses

The primary hypothesis of this research and one not investigated empirically in prior studies is:

Hypothesis 3 ($H3_0$):

Security excess returns of parent firms spinning off segments are not related to LODI that result from spinoffs.

Further, the possibility that the size of the spunoff unit and LODI are not independent explanatory variables suggests:

Hypothesis 4 ($H4_0$):

Security excess returns of parent firms spinning off segments are not related to the interaction of the explanatory variables size and LODI.

3.1.3 Related Investigations

LOB research shows segment disclosures improve earnings forecasts and increase investor consensus of the risk assessment of securities. This suggests a hypothesis similar to $H3_0$; i.e., variations in security excess returns of parent firms spinning off segments are not related to LODI which result from spinoffs. Since security return dispersion is not a focal point in spinoff studies, the preceding hypothesis is considered secondary to $H3_0$ and is investigated in conjunction with $H3_0$.

In an effort to increase the validity of this research, beta constancy before and after spinoff announcements is analyzed. Details related to the risk analysis methodology are provided in 3.2.5 below. Also, the possibility of confounding factors is investigated. Hite and Owers (1983) and Schipper and Smith (1983) examine such factors by classifying their sample firms according to the stated rationale given for the spinoffs in press releases, calculating returns for the classifications that emerged and comparing the results to those of the overall sample. Like procedures are carried out in this study. No attempt is made to identify a wealth transfer from bondholders to shareholders. Studies by Schipper and Smith (1983) and Hite and Owers (1983) did not find evidence to support such a transfer.

The possibility that spinoff announcement information concerning the taxability of the spinoff dividend to shareholder recipients confounds the results of this study is also considered. Sample firms are categorized according to the spinoff dividend taxability information available in the spinoff announcement, then returns for the categories are calculated and compared to the results of the overall sample.

Spinoffs must be filed with the SEC. The market reaction to the date required documents are filed is investigated. This investigation is independent of the other results of this study because the SEC filing date almost always follows the spinoff announcement date which is the study's primary focus.

3.2 METHODOLOGY

3.2.1 Excess Returns Measurement

Hypothesis 1 is tested using daily excess returns. Excess returns for the firms spinning off segments are obtained directly from the CRSP Excess Returns File which uses the Scholes and Williams method (1977) of adjusting for nonsynchronous trading.[3] The general form of excess returns estimation is given as follows:

$$ar_{it} = r_{it} - ER_{it} \qquad (1)$$

[3] Specifically, ER_{it} is estimated by annual groupings of all securities listed on the NYSE and the AMEX into ten equal control portfolios ranked according to the Scholes and Williams (15) beta estimates from the prior year. Each security is thus assigned to one of the ten portfolios. The observed return for the control portfolio to which security i is assigned is then used as the estimate of ER_{it}. The excess return, ar_{it}, is then calculated according to equation (1).

where,

ar_{it} = the excess return for security i in period t,

r_{it} = the observed return for security i in period t,

ER_{it} = the expected return for security i in period t.

For each portfolio of securities, the average excess return, denoted AR_t, is estimated for each day over the period of interest surrounding the event date (t=0). The average excess returns are estimated for each value of t from -10 to +10 days around the event date according to the following equation:[4]

$$AR_t = \sum_{i=1}^{n} ar_{it}/n \tag{2}$$

(for i=1 to n securities).

The effect of the spinoff announcement on shareholder wealth for a given time period beginning at K(t=-10) and extending through L(t=+10) is examined using cumulative average residuals (CAR's). The CAR over the period K to L is defined as follows:

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[4] Schipper and Smith (1983), Hite and Owers (1983), and Miles and Rosenfeld (1983) used much longer event periods to be certain they captured the market's reaction to their spinoffs. Their results justify the use of a shorter event window.

$$CAR_{K,L} = \sum_{t=K}^{L} AR_t \tag{3}$$

The following t-test[5] is used to test for the significance of the CAR's.

$$t_{CAR} = \frac{CAR_T}{(Var(CAR_T))^{\frac{1}{2}}} \tag{4}$$

where T is the number of days from K to L.

The AR_t's are calculated for the total sample, each of the subsamples formed according to the level of pre-spinoff disaggregated accounting information and for each size quartile. After testing the significance of excess returns, pairwise comparisons of the means and variances of the different subsamples are made to check for statistically significant differences. Pairwise comparison procedures are detailed in Appendix C.

As usual with event studies of this type (Miles & Rosenfeld, 1983; Hite & Owers, 1983), CAR's of various subsets of the event period are examined. However, the reaction at t=-1,0 is of primary interest. Another period that is closely scrutinized is the period t=+1 through t=+10. This subperiod is of

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[5] This t-test assumes that the excess returns are uncorrelated over time (Brown & Warner, 1985). The use of the Scholes-Williams method (15) of adjusting for nonsynchronous trading should result in excess returns which approximately satisfy this assumption.

interest because it is the period during which actual financial data related to the spunoff unit should be filed with the SEC, thus noticeable differences for the disaggregation levels are expected.

In addition to Hypothesis 1, the excess returns methodology is used to measure the market's reaction to spinoffs at the SEC filing date. The only difference is that reference to the event date in the preceding paragraphs changes to the filing date.

3.2.2 Size Proxy Measure

To analyze Hypothesis 2 empirically, a spinoff size categorization is necessary. As in Hite and Owers (1983, p. 417), a proxy for the portion of the parent's equity value spunoff is computed as follows:

$$\text{Proportion Divested} = \alpha P_s/(P_p + \alpha P_s)$$

where,

α is the number of spunoff unit shares issued per original parent share,

P_s is the distribution value of each share of the spunoff unit which must be established by the board of directors as of the ex-dividend date,

P_p is the ex-dividend value of the parent company shares.

Section 3.3 and Table 2 present data regarding the actual size measurements for the spinoffs in this study.

3.2.3 Identification of Subgroups

To analyze Hypothesis 3 empirically, LODI are identified. Classification of pre-spinoff LODI involves examination of segment disclosures in the parent's annual report closest to and preceding the spinoff announcement. Also, documents filed by the parent with the SEC that contain segment information are examined for a period of two years preceding the spinoff announcement. These latter items are a possible source of segment disclosures representing publicly available accounting data other than those found in annual reports.

In the process of checking the aforementioned sources for the availability of pre-spinoff accounting information for the spunoff units, five natural levels surfaced. These levels and the number of spinoff transactions identified in each are:

1. No specific accounting data for the segment spunoff existed prior to spinoff announcement (8 spinoffs).
2. Existing accounting data related to the spunoff unit could not be distinguished from two or more segments in the annual reports and/or SEC documents examined (20 spinoffs).
3. Only the five financial items required by FASB #14 are reported for the spunoff segment prior to the spinoff announcement (35 spinoffs). The financial items required by FASB #14 are revenues, operating income, identifiable assets, depreciation expense, and capital expenditures.

4. The pre-spinoff data for the spunoff unit exceeded that required by FASB #14 but fell short of complete financial statements (3 spinoffs).
5. Complete financial statements existed for the spunoff unit prior to the spinoff (13 spinoffs).

Although the data are presented in Chapter 4 for the preceding five levels, interpretation problems arise due to the limited number of transactions identified in level 1 (8 spinoffs) and level 4 (3 spinoffs). For this reason, the majority of the data analysis in Chapter 4 is carried out using a three-level scheme; that is, levels 1 and 2 are collapsed into a single level, as are levels 4 and 5. Therefore, most of the data analysis by pre-spinoff LODI is carried out using the following three levels (the number of spinoffs in each is shown in parentheses):

1. Available accounting information for the spunoff unit prior to the spinoff announcement was less than that required by FASB #14 (28 spinoffs); hereafter, level of disaggragated information 1 ($LODI_1$).
2. Only the five items required by FASB #14 are reported for the spunoff segment prior to the spinoff announcement (35 spinoffs)[6]; hereafter, hereafter, level of disaggragated information 2 ($LODI_2$).
3. Available accounting information for the spunoff unit prior to the spinoff announcement exceeded that required by FASB #14 (16 spinoffs); hereafter, level of disaggragated information 3 ($LODI_3$).

Two examples of spinoffs in each of the LODI are included in Appendix B.

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[6] FASB #14 information is included in notes to financial statements, and is audited information.

3.2.4 Size, LODI Interaction

The possible interaction effect of the size of the spunoff unit and LODI on security excess returns is investigated using the following model:[7]

$$\mathrm{CAR}\ (K,L)_i = a_0 + a_1X_i + a_2Y_r + a_3X_iY_r + a_4Y_s + a_5X_iY_s + \epsilon_i$$

where,

$\mathrm{CAR}\ (K,L)_i$ = the cumulative excess return for firm i over the period K to L.

a_0 = the regression intercept estimate

a_j = the regression coefficient estimates (j=1-5)

X_i = a continuous size variable measured as defined in Section 3.2.2.

Y = the disaggregation classification variable

Y_r = 1 if $LODI_1$
0, Otherwise

Y_s = 1 if $LODI_2$
0, Otherwise

Hypothesis 4 stated previously is equivalent to testing H_0: $a_3 = a_5 = 0$. Appropriate F-tests of this hypothesis will be conducted. Should H_0 be rejected, appropriate discussion of statistically significant coefficients will be presented.

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[7] The error terms, ϵ_i, are assumed to be normally and independently distributed with mean zero and variance σ^2; Ott (1984), page 498.

The above model is analyzed in reduced form, i.e. without insignificant terms, where this is appropriate.

3.2.5 Risk Analysis

One possible shortcoming of the Scholes-Williams estimation of excess returns is the assumption that the market model, or beta, is stable over time. In the case of spinoffs this may not be an accurate assumption. To test this assumption, betas prior to and after the spinoff are estimated and compared using the Chow test. Specifically, beta is estimated using the following regression model:

$$R_{it} = \alpha_i + \beta_i R_{mt} + \epsilon_{it}$$

where,

R_{it} = return on security i on day t

R_{mt} = return on the value weighted market index on day t

α_i = the regression intercept for firm i

β_i = the regression slope coefficient for firm i

To estimate the model prior to day 0, the observations for t=-120 through -2 are used. The estimates of beta after the announcement are obtained using observations t=+2 through each firm's ex-date. The ex-date is the date the spunoff unit actually begins to trade as a separate entity. Parent returns after this date are not appropriate for the risk analysis as they no longer represent the same trading entity. This analysis, therefore, can only include sample firms with sufficient data to estimate a stable post-announcement beta. From Schipper and Smith (1983), it was expected ex ante that two-thirds of the sample would be used. However, of the 79 spinoffs included in this study, there is sufficient data to estimate a stable post-announcement beta for 63 spinoffs.

For each of these 63 spinoffs, the Chow test is used to test whether a statistically significant shift in beta exists. The specific formulation of the Chow test is given as follows (Kmenta, 1971, p. 373):

$$\frac{(SSE_c - SSE_1 - SSE_2)/K}{(SSE_1 + SSE_2)/(n+m-2K)} \sim F_{K,\,n+m-2K}$$

where,

SSE_1 = sum of the squared residuals for the pre-event regression

SSE_2 = sum of the squared residuals for the post-event model

SSE_c = sum of the squared residuals from a regression model using the observations from both the pre- and post-event models

n = 120 observations for the pre-event model

m = 124 observations from the post-event model

K = 2, the number of parameters estimated

An attempt is made to infer the impact of firms experiencing a significant shift in beta on the traditional security excess returns analysis by recalculating the excess returns without the firms having a significant beta shift and comparing these results to the original excess returns. This approach is suggested by Hearth and Zaima (1984) who found that less than 20 percent of their selloff sample experienced a beta shift with no apparent effect on their excess returns analysis. Sicherman and Pettway (1987), in a study examining parent firms purchasing divested assets, found that only 4 of 49 sample firms experienced a significant shift in beta. Ex ante, it was not expected that beta shifts resulting from spinoff announcements would seriously affect the excess returns. This suggested beta analysis is not perfect, but the fact that the spinoff ex-date results in a different parent entity complicates the traditional pre- and post-regression approach with no ideal solution.

3.3 SAMPLE DESCRIPTION

The spinoff sample being analyzed in this study is obtained by identifying transactions coded as noncash stock dividends from the CRSP Daily Master File which includes all firms traded on the NYSE and/or ASE. The resultant list is supplemented by including all firms paying dividends in the stock of another company. Such firms are identified from *Moody's Dividend Record*. Each transaction on the complete list of possible spinoffs from both sources is verified as a spinoff by examining the appropriate *Moody's Industrial Manual*. To be included in the sample, each of the spinoff units must have a parent firm that is a pre-existing publicly traded entity listed on the CRSP Daily Returns File during the period of analysis. A total sample of 118 spinoffs announced during the period January 1, 1980 through December 31, 1987 was identified.

The following criteria were used to qualify transactions from the total sample for inclusion in the sample being analyzed (the number of transactions from the total sample excluded because of the qualification are shown in parentheses):[8]

1. The spinoff must be voluntary and not undertaken to comply with regulatory directives (2 transactions excluded).
2. The spinoff should not be part of a liquidation or bankruptcy proceeding (6 transactions excluded).
3. The spinoff announcement should not coincide with estimated earnings announcements, unexpected dividend announcements, or other major news releases related to the parent firm, and/or the event period of each transaction should be free of firm specific news releases that could impact on security returns (27 transactions excluded).

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[8] Qualifications were identified during the process of event date specification. See Appendix D.

4. The stock of the spunoff unit must be free to trade separately and not be "paired" for trading purposes with the stock of the parent company (4 transactions excluded).

The final sample consists of 79 spinoffs (118 less 39 exclusions) divested by 75 different companies. Appendix A lists the spinoffs in the final sample alphabetically by parent firm. Also included in Appendix A are the month and year of the first announcement of each spinoff and the SIC code of the parent firm.

The sample transactions included are widely dispersed over the 1980 to 1987 time period as shown in Table 1. The industrial classifications are widely dispersed also. The most frequently represented classification is the Crude Oil and Natural Gas Industry (SIC 1311). Seven parent companies are so classified. Other than SIC 1311 there are only seven other repeat classifications. Fifty-four different classifications are represented by the 75 parent companies in the study.

Size of the spunoff unit, measured by the proportion of equity value spunoff, is another important spinoff characteristic. Table 2 presents the range of size values, by quartile, for the 79 spinoffs. Overall the proportion of divested values range from .3 percent to 84 percent, with the median value being 13.9 percent. Section 3.2.2 provides methodological details regarding the size approximation used.

Table 1

Spinoffs by Announcement Year

Year		Number of Spinoffs
1980		7
1981		7
1982		10
1983		19
1984		9
1985		9
1986		14
1987		4
	Total	79

Table 2

Range of the Proportion of Equity Value Spunoff by Quartile

Quartile	Range of Equity Values Spunoff
1	.003 to .059
2	.060 to .139
3	.139 to .354
4	.361 to .844

3.4 EVENT DATE SPECIFICATION

Spinoffs usually involve more than one announcement. Typically, the announcement of an intention to divest is followed by an announcement of completion of the transaction. In all such cases the first announcement of the entire chain of events is taken to be the event date, hereafter referred to as t=0.

The announcement/effective date of the transaction is taken from *Dow Jones News Wire and the Broadtape Transcripts*.[9] This service provides the date and time of the announcement, making it possible to verify if the announcement was made after the market's closing; if so, the event date is defined as the next trading day. All news items related to individual firms appearing during the year prior to the announcement date were examined to be sure the announcement date was identified correctly. In case the announcement date falls on a non-trading day, the first trading day following the announcement is considered the event date. When no public announcement is made subsequent to the effective date of the spinoff, the event date is defined as the date the transaction becomes effective. Appendix D outlines event date specification steps in more detail.

In chapter 4 the data are analyzed and findings discussed.

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[9] Includes press articles from *Dow Jones News*, *The Wall Street Journal*, and *Barron's* from June 1979.

CHAPTER 4

DATA ANALYSIS AND FINDINGS

4.1 INTRODUCTION

This chapter follows the logical order suggested by section 3.1, Hypothesis Formulation. More specifically data are presented, analyzed, and interpreted for each of the four hypotheses in the order given in section 3.1.[10] Risk analysis results are then presented and discussed. Next, findings relating to a categorization of spinoffs by stated reason for each spinoff are mentioned. Categorization of spinoffs according to the reason stated in press releases was done to check on the possible effect of factors that could confound the two primary hypotheses of this dissertation. Findings relating to announcement information concerning the taxability of the spinoff dividend to shareholder recipients are also presented. Finally, data related to security returns measurement at the date accounting data for spinoffs technically becomes available to the public for the first time are presented and analyzed. The date used for this final analysis is the date of the first SEC document filing for each of a subsample of this study's spinoff transactions.

[10] All computer programs for this dissertation were compiled on an IBM 3090 computer and data subroutines were adapted from SAS Version 5.

4.2 EXCESS RETURNS FOR THE COMPLETE SAMPLE

The first null hypothesis, $H1_0$, is "the announcement of corporate spinoffs is not related to excess security returns." This is the first of two confirmatory hypotheses being examined using information from this study's more current sample of spinoffs.

Information presented in Table 3 and supplementary data shown in Tables 4 and 5 provide evidence that refutes $H1_0$ and/or describes security returns for this study's complete sample.

Table 3 shows the average security returns for the complete sample over the period of analysis, t=-10 through t=+10, by day. Day 0 is the announcement/event day. The T statistic in Table 3 is a test of the null hypothesis that the average security return equals zero. The significance level of each day's test statistic is interpreted from the "Probability >|T|" column in the table. A significance level or p-value less than or equal to .05 is commonly viewed as an indication of statistical significance and evidence to support rejection of the null hypothesis. The Table 3 significance levels show that only the average security return for day 0 is significantly different from zero, p value ≤.0001. Therefore, the evidence supports the conclusion that the announcement of corporate spinoffs does result in excess security returns and evidence from this study's more current sample of voluntary spinoffs confirms similar findings

Table 3

Average Security Returns and P-Values[a] for 79 Voluntary Spinoffs Over the Period of Analysis, t=-10 through t=+10, 1980-1987.

Day[b]	Number of Firms[c]	Average Security Return, AR	T Statistic	Probability >|T|[a]
-10	78	.0037	1.24	.2193
- 9	77	-.0020	- .69	.4922
- 8	78	.0024	.86	.3910
- 7	78	-.0007	- .32	.7530
- 6	77	-.0017	- .78	.4357
- 5	77	.0014	.60	.5534
- 4	78	.0013	.46	.6470
- 3	79	-.0023	-1.14	.2597
- 2	79	-.0005	- .19	.8480
- 1	79	.0051	1.79	.0780
0	79	.0354	5.55	.0001
+ 1	79	.0041	1.09	.2773
+ 2	79	-.0007	- .23	.8174
+ 3	79	-.0033	-1.20	.2353
+ 4	79	-.0029	-1.05	.2957
+ 5	79	-.0047	-1.83	.0712
+ 6	79	-.0003	- .15	.8839
+ 7	79	-.0025	- .99	.3237
+ 8	79	-.0028	-1.02	.3121
+ 9	79	-.0046	-1.67	.0986
+10	78	.0019	.77	.4456

[a]The smaller the probability the greater is the evidence for rejecting the hypothesis that no excess return exists. A value of .05 or smaller is commonly viewed as statistically significant.

[b]Day 0 is the event date; that is, the date of the earliest press release.

[c]Two sample transactions have missing stock returns prior to day t=-3, and one transaction has a missing stock return on day t=+10.

Table 4

Cumulative Average Residuals (CARs) and P-Values; Subsets of the Event Period for 79 Voluntary Spinoffs, 1980-1987.

Time Period[b]	CAR	T Statistic	Probability >|T|[a]
-10 to -2	.0015	.22	.8292
- 1 and 0	.0404	5.81	.0001
+ 1 to +10	-.0158	-1.86	.0671

[a]The smaller the probability the greater is the evidence for rejecting the hypothesis that no excess return exists. A value of .05 or smaller is commonly viewed as statistically significant.

[b]Day 0 is the event date; that is, the date of the earliest press release.

Table 5

Contingency Table of CAR (-1,0) Values: This Study's 1980-1987 Sample Compared to Schipper and Smith's[a] 1963-1981 Sample

Range of CAR (-1,0) Values	Number of Spinoffs: This Study	Number of Spinoffs: Schipper & Smith[a]
CAR>+.20	2	3
+.10<CAR≤+.20	8	7
+.05<CAR≤+.10	22	18
+.01<CAR≤+.05	25	23
.00<CAR≤+.01	3	11
-.01<CAR≤ .00	5	9
-.05<CAR≤-.01	11	15
-.10<CAR≤-.05	2	5
-.20<CAR≤-.10	1	1
CAR≤-.20	0	0
Total	79	92

	Related Computations: This Study	Related Computations: Schipper & Smith[a]
Percent of Positive Values	75.9%	67.3%
Median Value	+.037	+.014
Minimum/Maximum	-.106 to +.31	-.175 to +.298
Range	.416	.473

[a] From Schipper and Smith (1983), page 444.

from earlier research by Schipper and Smith (1983), Hite and Owers (1983), Miles and Rosenfeld (1983), and Rosenfeld (1984).

Cumulative average residuals (CARs) or cumulative average security returns covering three nonoverlapping subsets of the event period are displayed in Table 4. The three time periods for which CARs are shown are t=-10 through t=-2, t=-1 and 0, and t=+1 through +10. CAR (-1,0) largely dictates the division of the event period chosen. It is viewed as the primary measure of the market response to the spinoff announcement and is the focus of discussion in prior spinoff empirical studies. CAR (-10,-2) is presented as a preannouncement market reaction measure and CAR (+1,+10) is a measure of the postannouncement market reaction.

CAR (-1,0) from Table 4 is 4.04 percent and is highly significant (p-value ≤.0001). This is not surprising as CAR (-1,0) is the sum of the average returns for day -1 and day 0 from Table 3. The significance of this CAR is alternative evidence supporting the conclusion that the announcement of corporate spinoffs does result in excess security returns. Notably this study's 4.04 percent reaction is comparable to CAR (-1,0) reactions observed in prior research studies. As related in the literature review, Schipper and Smith (1983) report a 2.84 percent CAR (-1,0) and Hite and Owers (1983) find a reaction of 3.3 percent for their spinoff sample. The latter result is almost identical to the finding reported by Miles and Rosenfeld (1983).

Further information regarding this study's CAR (-1,0) values is presented in Table 5. This table compares a frequency distribution of the CAR (-1,0) values for this study's 79 spinoffs to a similar distribution reported in Schipper and Smith (1983). Sixty of this study's 79 CARs are positive (76%), their median value is +3.7 percent, and the range of values is from -10.6 percent to +31.1 percent. The 92 CARs in the Schipper and Smith study are 67 percent positive, have a median value of 1.4%, and range from -17.5 to +29.8 percent. Also, both studies have the same number of positive CARs greater than +.10, ten, and the negative CARs lower than or equal to -.05 equal 3 in this study versus 6 in the Schipper and Smith (1983) study. Hite and Owers (1983) report similar information for their sample of spinoffs though they use different range categories than those used in Table 5. Their sample's CAR (-1,0) values are 69 percent positive and range from -14.4 to +29.9 percent.

CAR (-10,-2) from Table 4 is almost zero and is not significant (p value =.8292). This preannouncement market reaction result supports the Schipper and Smith (1983) conjecture that since only one firm is involved in a spinoff, news related to the proposed divestiture is less likely to leak to the capital market than in an interfirm exchange.

The postannouncement market reaction, CAR (+1,+10), presented in Table 4 is negative 1.58 percent and has a significance level of .0671. Though significance tests in prior spinoff studies do not correspond exactly to this study's postannouncement period, Hite and Owers (1983) report a negative CAR of 1.8 percent from day t=+2 through t=+8 without relating a significance level for this value. Schipper and Smith (1983) report a negative 1.97 percent CAR for the period t=+1 through t=+40. This CAR was not significant at the .05 significance level.

In subsequent sections of this chapter more detailed analyses of CAR values presented in Table 4 are included to facilitate the comparisons of these values to corresponding values of various subgroups of the complete sample. These are included in sections 4.4, 4.5, and 4.7 that discuss this study's findings related to $H3_0$, $H4_0$, and possible confounding factors.

Since the CARs for the periods presented in Table 4 are the focus of the discussion in much of the remainder of this study, it is desirable to know what effect outliers might have on them. Four spinoffs have CAR values that can be considered outliers.[11] Therefore, the CAR values for the periods shown in Table 4 were computed a second time for the complete sample excluding the outliers. The results are presented in Table 6 which compares the CARs with and without outliers. Table 6 clearly shows that without the outliers CAR (-1,0) remains statistically significant at the .0001 level, and CAR (-10,-2) is virtually unchanged.

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[11] Outliers are identified using procedures suggested by Ott (1984), page 46. They are CARs < (lower quartile - 1.5 times the interquartile range) or > (upper quartile + 1.5 times the interquartile range). The interquartile range is the difference between the lower and upper quartiles. This study's outliers are Datapoint Corp., Gulf Canada Resources Ltd., Southland Royalty Co., and Transworld Corporation.

Table 6

Cumulative Average Residuals (CARs) and P-Values[a]: Subsets of the Event Period for the Complete Sample (N=79) Versus the Complete Sample Excluding Four Statistical Outliers (N=75), 1980-1987

	Time Period[b]	CAR	T Statistic	Probability >|T|[a]
Complete Sample	-10 to -2	.0015	.22	.8292
Without Outliers	-10 to -2	.0013	.18	.8581
Complete Sample	-1 and 0	.0404	5.81	.0001
Without Outliers	-1 and 0	.0354	6.68	.0001
Complete Sample	+1 to +10	-.0158	-1.86	.0671
Without Outliers	+1 to +10	-.0190	-2.30	.0241

[a]The smaller the probability the greater is the evidence for rejecting the hypothesis that no excess return exists. A value of .05 or smaller is commonly viewed as statistically significant.

[b]Day 0 is the event date; that is, the date of the earliest press release.

Only the postannouncement reaction measure is different. Without the outliers CAR (+1,+10) becomes a larger negative number and is statistically significant at the .0241 significance level. This fact is considered further in later sections of the chapter.

In summary, section 4.2 presents results leading to the rejection of $H1_0$, and permitting the conclusion that announcement of corporate spinoffs does result in significant, positive security excess returns. In other words, this study's more current sample of spinoffs confirms results reported in past studies. Comparisons of the CAR (-1,0) frequency distribution results of this study to earlier research samples shows that there are many similarities between the samples. Finally, a comparison of the key CAR values for this study's sample with and without statistical outliers reveals outliers do not have an important impact on the CAR (-10,-2) and CAR (-1,0) values reported in Table 4.

The next section of this chapter presents results concerning the importance of the spinoff unit's size to spinoff excess returns. Conclusions regarding $H2_0$, "security excess returns of parent firms spinning off segments are not related to the size of the segments spunoff," are the focus of discussion.

4.3 RELATIONSHIP BETWEEN EXCESS RETURNS AND PERCENT OF THE PARENT'S EQUITY VALUE SPUNOFF

The second null hypothesis, $H2_0$, is "security returns of parent firms spinning off segments are not related to the relative size of the segments spunoff." The size of the segments spunoff is viewed as the percent of the parent company's equity divested, and is measured using the proxy measure explained in section 3.2.2. $H2_0$ is the second of two confirmatory hypotheses being examined using this study's updated spinoff sample.

To examine this hypothesis, the CAR (-1,0) values for each spinoff transaction in the complete sample are treated as dependent variable values and a regression analysis is completed using the size measure as the regressor variable. The results of this regression are displayed in Table 7, Panel A. As shown, the regression test statistic is significant at the .0001 level; i.e., highly significant. This indicates a strong relationship between size and CAR (-1,0). The coefficient of determination, R^2, indicates that size explains 18% of the variation in CAR (-1,0). These results permit the rejection of $H2_0$ and thus the conclusion that excess returns resulting from the announcement of corporate spinoffs are strongly related to the percent of parent's equity divested. As expected, this study's more current spinoff sample confirms previous findings concerning the relationship between size and security returns of spinoffs as

Table 7

Regression Analyses: CARs Regressed on Proportion of Parent Company's Equity Spunoff or Size; Voluntary Spinoffs 1980-1987

	Panel A CAR (-1,0) for Complete Sample	Panel B CAR (-1,0) Without Statistical Outliers	Panel C CAR (+1,+10) for Complete Sample
Regression F Test Statistic	16.916	12.862	.575
F Significance Level	.0001[c]	.0006[c]	.4505
CAR Mean	.0404[a]	.0354[b]	-.0158[a]
R-Square	.1801	.1498	.0074
Adjusted R-Square	.1695	.1381	.0055
Size Coeffient T Test Statistic	4.113	3.586	.758
T Significance Level	.0001[c]	.0006[c]	.4505

[a]Also reported in Table 4.

[b]Also reported in Table 6.

[c]Highly significant; high significance usually associated with level ≤.01.

reported by Hite and Owers (1983) and Miles and Rosenfeld (1983). Only Hite and Owers (1983) report results of a regression analysis. Their regression shows an adjusted r-square of .164 and a highly significant size coefficient. They do not report a significance level.

Table 7, Panel B shows the results of a second regression analysis. In this regression the four statistical outliers described in section 4.2 are excluded. Estimation of the regression model excluding outliers assures that outliers are not distorting the results for the complete sample. The results closely parallel those for the complete sample permitting further inspection of the Panel A results without fear of making invalid inferences.

Results from a third regression are pictured in Table 7, Panel C. In this regression the postannouncement reaction measure, CAR (+1,+10), is the dependent variable. The size of the spinoff is again the independent variable. This analysis is undertaken to determine if size is related to the CAR (+1,+10) value of -1.58% reported in Table 4. The Table 7, Panel C significance levels clearly indicate size of the spinoff and the postannouncement reaction measure are not related.

Since there is virtually no preannouncement market reaction, a regression of CAR (-10,-2) values on size is not examined.[12] Additional details regarding the

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[12] CAR (-10,-2) values were presented in Table 4.

relationship between spinoff size and the announcement reaction as measured by CAR (-1,0) are now highlighted.

To present a thorough analysis of the size/CAR (-1,0) relationship, the complete sample is divided into two halves based on the proportion of parent equity spunoff. The median size of 13.9% divested separates the first half of the sample, the half with the "small" spinoffs, from the second half of the sample. Then each of the two halves are divided again resulting in quartile subsamples based on size.[13] For each half of the sample and each quartile subsample CAR (-1,0) mean and standard deviation values are calculated. Significance tests are then used to examine whether the respective subsample mean and variance are statistically different from corresponding values of its closest counterpart. That is, CAR (-1,0) mean and variance for the first half of the sample are compared to CAR (-1,0) mean and variance for the second half of the sample; quartile one values are compared to those of quartile two and so on. The comparisons are shown in Table 8 with pertinent test statistic values and significance levels.

Table 8 shows that the mean CAR (-1,0) value for the first half of the sample is 1.84% versus 6.42% for the half having the larger spinoffs. The difference between these values is significant at the .001 level. Also, the variance of the CAR (-1,0) values for the second half of the sample is significantly larger than the comparable value from the first half of the sample. Thus, size of the

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[13] This study's proportion of equity values spunoff by quartile were presented in Table 2.

Table 8

Comparisons of CAR (-1,0) Mean and Variability for Subsamples Formed by Proportion of Parent Equity Divested or Size; Voluntary Spinoffs 1980-1987

	CAR (-1,0)		Test of H_0: Means are Equal		Test of H_0: Variances are Equal	
	Mean	Stand. Dev.	T Value[a]	P-Value[b] of T	F Value[a]	P-Value[b] of F
First Half of Sample[c]	.0184	.0411	3.46	.0010[e]	3.03	.0008[e]
Second Half of Sample	.0642	.0715				
Quartile 1[d]	.0150	.0356	.54	.5955	1.79	.2135
Quartile 2	.0221	.0476				
Quartile 2	.0221	.0476	1.96	.0574[f]	1.14	.7828
Quartile 3	.0526	.0507				
Quartile 3	.0526	.0507	.92	.3678	3.00	.0221[f]
Quartile 4	.0737	.0878				

[a]Test statistic value.
[b]Significance level.
[c]Sample partitioned by median spinoff size of 13.9% divested; first half of sample has the smaller spinoffs.
[d]Sample quartile range by size is presented in Table 2; quartile 1 has the smallest spinoffs.
[e]Highly significant.
[f]Significance close to or <.05.

spinoff impacts positively both the mean and dispersion of the announcement reaction measure.

The quartile comparisons relate the change in CAR (-1,0) central tendency and variability values as size increases from the first through the fourth quartile. Significant differences between adjacent quartiles are not prevalent although both the mean and variability of CAR (-1,0) increase steadily. The largest mean comparison difference is between quartiles 2 and 3. This quartile comparison shows a jump in the mean CAR (-1,0) value from 2.21% in the second quartile to 5.26% in the third quartile, a difference significant at the .0574 level. The comparison of quartile 3 to 4 presents the most significant difference in CAR (-1,0) variances. The variances between these two subsamples are significantly different at the .0221 level.

An overview of the Table 8 data is that as the size of the spunoff unit increases, so does both the mean and dispersion of the announcement reaction measure CAR (-1,0). The largest CAR (-1,0) mean and standard deviation values are therefore those of quartile 4: 7.37% and .0878, respectively.

The large mean value of CAR (-1,0) for the fourth quartile suggests the need for an examination of the effect of very large spinoffs on the announcement reaction measure. Therefore, as a final analysis of the effect of size on excess security returns associated with spinoffs, the eight largest spinoffs or upper decile are excluded from the complete sample and the CARs for the sample's remaining 71 spinoff transactions are calculated. The resultant values are compared to those for the complete sample in Table 9. All of the Table 9 values are virtually identical for the complete sample and the subsample excluding the large spinoffs. An exception is that CAR (-1,0) drops from 4.04% for the complete sample to 3.28% for the subsample. However, the latter value is statistically significant at the .0001 level suggesting that the reaction to very large spinoffs is not influencing the market reaction for the complete sample unduly.

The information and analysis of this section's size discussion permits the rejection of $H2_0$ and the conclusion that excess security returns resulting from the announcement of corporate spinoffs are directly related to the proportion of equity value divested, or spinoff size. In fact, spinoff size accounts for approximately 18% of the variability in the announcement returns. It is also clear that neither statistical outliers nor large spinoffs have a meaningful impact on the CAR (-1,0) values for the complete sample, and that size is unrelated to the postannouncement reaction measure CAR (+1,+10).

The next portion of this chapter, section 4.4, examines the relationship between spinoff excess returns and varying levels of accounting information existing prior to spinoff announcement. Section 4.5 presents further information related to spinoff size as the dual impact of size and levels of disaggregated information (LODI) on spinoff excess returns is analyzed.

Table 9

Cumulative Average Residuals (CARs) and P-Values[a]: Subsets of the Event Period for the Complete Sample (N=79) Versus the Complete Sample Excluding Eight Largest Spinoffs[b] (N=71), 1980-1987

	Time Period[c]	CAR	T Statistic	Probability >|T|[a]
Complete Sample	-10 to -2	.0015	.22	.8292
Without Upper Decile	-10 to -2	.0014	.20	.8396
Complete Sample	-1 and 0	.0404	5.81	.0001
Without Upper Decile	-1 and 0	.0328	6.09	.0001
Complete Sample	+1 to +10	-.0158	-1.86	.0671
Without Upper Decile	+1 to +10	-.0169	-1.94	.0558

[a]The smaller the probability the greater is the evidence for rejecting the hypothesis that no excess return exists. A value of .05 or smaller is commonly viewed as statistically significant.

[b]Eight largest spinoffs are those transactions having the largest proportion of parent equity divested.

[c]Day 0 is the event date; that is, the date of the earliest press release.

4.4 THE RELATIONSHIP BETWEEN EXCESS RETURNS AND LODI

The third null hypothesis, $H3_0$, is "security excess returns of parent firms spinning off segments are not related to LODI that result from spinoffs." There are five LODI described in section 3.2.3. These five levels range from level 1, no specific accounting information for the spunoff segment existed prior to the spinoff announcement, to level 5, complete financial statements existed for the spunoff segment prior to the announcement. As explained in section 3.2.3, two of the five LODI contain very few spinoff transactions which can cause data interpretation problems. Therefore, the five original levels are realigned into a three level scheme. The three level scheme consists of $LODI_1$, little accounting information about the spunoff unit existed prior to the spinoff announcement; $LODI_2$, FASB #14 information existed prior to the spinoff announcement; and $LODI_3$, more accounting information than required by FASB #14 existed prior to the spinoff announcement.

Large excess returns are expected for spinoffs about which little information is available prior to the announcement, and small or no excess returns are expected for spinoffs having substantial accounting information prior to the announcement. The logic being in the former situation users of parent company financial statements receive information not available previously, while in the latter situation the spinoff announcement provides these users with essentially no new information.[14] The effect of LODI on the variation in excess returns is examined also.

The first data by LODI are presented in Tables 10 and 11. These tables relate CAR information for the announcement reaction measure, CAR (-1,0), and the postannouncement reaction measure, CAR (+1,+10), for the five original disaggregation levels and for the three level scheme.

The information for the five disaggregation levels in Table 11 is provided in the interest of completeness. Level 1 and level 4 contain only a few spinoff transactions, 8 and 3 respectively, and statistical inferences relating to such small subsamples are suspect. Therefore, only the Table 10 CARs are discussed in detail. Notice, however, how closely the three level scheme data resemble that of the five levels, excluding levels 1 and 4.

Both the CAR (-1,0) and CAR (+1,+10) measures contain meaningful patterns using three LODI. The announcement reaction to all three levels is significant. Also, $LODI_1$ experiences the largest reaction, 4.79%, versus a 2.99% announcement reaction for $LODI_3$. Thus, there is a 1.8% announcement reaction differential between spinoffs having little accounting information available prior to the announcement and those having much accounting information available prior to the announcement. Statistical tests of these differences are discussed below.

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[14]Rosenfeld (1984) believes spinoffs result in new information sources that allow shareholders to more closely monitor the activities of the firm.

Table 10

Cumulative Average Residuals (CARs) and P-Values by Three LODI; Subsets of the Event Period for 79 Voluntary Spinoffs, 1980-1987

Three Levels of Accounting Disaggregation[b]

CAR (-1,0): Spinoff Announcement Measure

	N	CAR	T Statistic	Prob. >|T|[a]
$LODI_1$	28	.0479	3.31	.0027
$LODI_2$	35	.0393	3.99	.0003
$LODI_3$	16	.0299	3.16	.0065

CAR (+1,+10): Postannouncement Measure

	N	CAR	T Statistic	Prob. >|T|[a]
$LODI_1$	28	-.0349	-2.26	.0321
$LODI_2$	35	-.0112	- .82	.4175
$LODI_3$	16	.0077	.78	.4448

[a]Significance level.
[b]Disaggregation levels explained in section 3.2.3.
[c]$LODI_2$ of the three level scheme is also level 3 of the five level scheme. These are the spinoffs for which the accounting information available prior to the spinoff announcement consists of FASB #14 data.

Table 11

Cumulative Average Residuals (CARs) and P-Values by Five LODI; Subsets of the Event Period for 79 Voluntary Spinoffs, 1980-1987

Five Levels of Accounting Disaggregation[b]

CAR (-1,0): Spinoff Announcement Measure

	N	CAR	T Statistic	Prob. >|T|[a]
Level 1	8	.0507	1.14	.2917
Level 2	20	.0467	4.18	.0005
Level 3[c]	35	.0393	3.99	.0003
Level 4	3	.0559	3.86	.0610
Level 5	13	.0239	2.24	.0449

CAR (+1,+10): Postannouncement Measure

	N	CAR	T Statistic	Prob. >|T|[a]
Level 1	8	-.0208	- .82	.4375
Level 2	20	-.0406	-2.10	.0498
Level 3[c]	35	-.0112	- .82	.4175
Level 4	3	-.0109	-1.78	.2173
Level 5	13	.0120	1.02	.3286

[a]Significance level.
[b]Disaggregation levels explained in section 3.2.3.
[c]$LODI_2$ of the three level scheme is also level 3 of the five level scheme. These are the spinoffs for which the accounting information available prior to the spinoff announcement consists of FASB #14 data.

Equally interesting is the pattern of the postannouncement reaction measure for the three LODI. $LODI_1$ has a statistically significant -3.49% return in the 10-day period following the spinoff announcement, while $LODI_3$ experiences an insignificant positive return for the same time period. The reaction for $LODI_2$ is between the reaction for the other two levels. An interpretation of these results is included following a discussion of statistical tests of the Table 10 differences.

Following naturally from Table 10 are comparisons of CAR mean differences between disaggregation levels. Such comparisons are presented in Tables 12 and 13 for the three level scheme only. In addition to CAR mean comparisons, CAR variability comparisons are presented and discussed.

The CAR (-1,0) comparisons in Table 12 reveal that although there is a steady decline in the mean value from $LODI_1$ to $LODI_3$, this decline does not result in statistically significant differences using pairwise statistical tests.[15] In other words, there is an inverse relationship between accounting information available prior to the spinoff announcement and the mean excess return reaction, but the differences between disaggregation levels are not statistically significant.

CAR (-1,0) dispersion measure comparisons are also of interest. Like the mean return, the CAR (-1,0) standard deviation values decrease as more pre-spinoff accounting information for the spunoff segments becomes available. In fact, the variance comparison between $LODI_2$ and $LODI_3$ reveals a .0768

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[15] Pairwise comparison procedures are detailed in Appendix C.

Table 12

Comparisons of CAR (-1,0) Mean and Variability for Three LODI; 79 Voluntary Spinoffs, 1980-1987

Subgroups[c]	CAR (-1,0) Mean	CAR (-1,0) Stand. Dev.	Test of H_0: Means are Equal T Value	Test of H_0: Means are Equal P-Value[b] of T	Test of H_0: Variances are Equal F Value[a]	Test of H_0: Variances are Equal P-Value[b] of F
$LODI_1$	.0479	.0765	.5034	.6165	1.72	.1335
$LODI_2$	.0393	.0583				
$LODI_2$	.0393	.0583	.6909	.4934	2.37	.0768
$LODI_3$	.0299	.0378				
$LODI_1$	.0479	.0765	1.0408	.3040	4.09	.0062[d]
$LODI_3$	.0299	.0378				

[a]Test statistic value.
[b]Significance level.
[c]Sample partitioned by the amount of accounting information about the spunoff segment available prior to the spinoff announcement; $LODI_1$ means the information available is less than FASB #14 requirements and $LODI_2$ indicates FASB #14 required information is available.
[d]Highly significant.

significance level, and a similar comparison between $LODI_1$ and $LODI_3$ is highly significant, p-value .0062. This information permits rejection of the secondary hypothesis included in the opening paragraph of section 3.1.3, and suggests that variations in security excess returns of parent firms spinning off segments are related to LODI which result from spinoffs.

Relating the CAR (-1,0) information to the postannouncement reaction measure comparisons from Table 13 is also of value. The CAR (+1,+10) mean values increase from -3.49% for $LODI_1$ to +.77% for $LODI_3$. This mean increase differential of 4.26% is significant at the .0249 level. The CAR (+1,+10) variability comparisons are even more distinct. The variance differences for both the $LODI_2$ versus $LODI_3$ and the $LODI_1$ versus $LODI_3$ pairwise comparisons are highly significant.

A conclusion from Table 12 is that the more accounting information available for the spunoff unit prior to the spinoff announcement, the smaller are the announcement reaction and the dispersion of these reactions. This seems to imply that the less pre-spinoff accounting information available, the more uncertain the spinoff announcement reaction. Furthermore, the postannouncement reaction differences from Table 13 seem to confirm this implication. That is, the CAR (+1,+10) mean values are more positive and less dispersed when pre-spinoff accounting information is greater. A look at $LODI_1$ for both the announcement and postannouncement period is particularly

Table 13

Comparisons of CAR (+1,+10) Mean and Variability for Three LODI; 79 Voluntary Spinoffs, 1980-1987

	CAR (+1,+10)		Test of H_0: Means are Equal		Test of H_0: Variances are Equal	
Subgroups[c]	Mean	Stand. Dev.	T Value	P-Value[b] of T	F Value[a]	P-Value[b] of F
$LODI_1$	-.0349	.0817	-1.1523	.2540	1.03	.9272
$LODI_2$	-.0112	.0806				
$LODI_2$	-.0112	.0806	-1.1249	.2662	4.20	.0046[d]
$LODI_3$	.0077	.0393				
$LODI_1$	-.0349	.0817	-2.3282	.0249[e]	4.32	.0046[d]
$LODI_3$	.0077	.0393				

[a]Test statistic value.
[b]Significance level.
[c]Sample partitioned by the amount of accounting information about the spunoff segment available prior to the spinoff announcement; $LODI_1$ means the information available is less than FASB #14 requirements and $LODI_2$ indicates FASB #14 required information is available.
[d]Highly significant.
[e]Significance <.05.

interesting. This subgroup's CAR (-1,0) mean is the largest, 4.79%, but all except 1.3% of the announcement excess return is reversed in the 10 days following the announcement, as shown by the -3.49% CAR (+1,+10). Such a trend does not exist for $LODI_3$ which has a positive announcement reaction and a positive postannouncement reaction. One can conclude only that as information about the spinoffs included in $LODI_1$ becomes available after the spinoff announcement, the event day reaction to these spinoffs is reevaluated.

To examine $H3_0$ directly, the CAR (-1,0) values for each spinoff transaction are treated as the dependent variable and a one-way analysis of variance (ANOVA) is completed using $LODI_1$, $LODI_2$, and $LODI_3$ as treatments. Table 14, Panel A, shows the results of this ANOVA.

Using the three levels as treatments in this ANOVA does not result in statistical significance. This is apparent from the .6493 significance level for the ANOVA F test statistic. In addition, R square indicates the LODI only explain 1.13% of the variation in CAR (-1,0). Thus, the data from this study's 79 spinoff transactions do not support rejection of $H3_0$, i.e., evidence does <u>not</u> support rejection of the hypothesis, "security excess returns of parent firms spinning off segments are not related to the level of new disaggregated accounting information which results from spinoffs."

Table 14

Analyses of Variance: CARs Analyzed on Three LODI Treatments; 79 Voluntary Spinoffs 1980-1987

	Panel A CAR (-1,0)	Panel B CAR (+1,+10)
ANOVA F Test Statistic	.43	1.77
F Significance Level	.6493	.1765
CAR Mean	.0404[a]	- .0158[a]
R-Square	.0113	.0446
$LODI_1$ Subgroup T Test Statistic[b]	.92	-1.82
T Significance Level	.359	.0727
$LODI_2$ Subgroup T Test Statistic [b]	.50	- .84
T Significance Level	.6172	.4047
$LODI_3$ Subgroup T Test Statistic[b]	1.92	.41
T Significance Level	.0589	.6808
Correlation	.106	.211

[a]Also reported in Table 4.
[b]Respective ANOVA treatment coefficient test statistic sample values.

In spite of the obvious Table 14 results, the treatment coefficient of $LODI_3$ is close to a .05 significance level. That is, $LODI_3$ seems to have an important relationship to CAR (-1,0).

Table 14, Panel B, relates the results of an ANOVA using CAR (+1,+10) values as the dependent variable. The three LODI are again the independent variable treatments. The Panel B results do not indicate statistical significance either, but show a stronger relationship between LODI and CARs than the results of Panel A; significance level is .1765. Also, this ANOVA indicates an important relationship between $LODI_1$ and the postannouncement reaction measure; the significance of the treatment coefficient is .0727. In addition, the correlation between LODI and CARs is .211 when CAR (+1,+10) is the dependent variable versus .106 when CAR (-1,0) is the dependent variable.

This part of chapter 4 leads to the conclusion that although spinoff announcement reactions are related directly to LODI resulting from spinoffs, the mean distinctions between levels are not statistically significant. However, there are statistically significant differences between LODI and the dispersion of CAR (-1,0); especially noteworthy is the variance difference between $LODI_1$ and $LODI_3$. In addition, relationships between disaggregation level and spinoff postannouncement reactions exist. Here there is a statistically significant mean difference between $LODI_1$ and $LODI_3$, and a very noticeable reversal of $LODI_1$'s large announcement reaction is seen in the 10 days following the spinoff announcement. Finally, the dispersion differences by disaggregation level are more pronounced for the CAR (+1,+10) values than they are for the announcement reaction measure.

The following section examines the combined effect of LODI and the percent of the parent company's equity divested on spinoff security returns. Of particular interest is the interaction of the LODI and size components.

4.5 INTERACTION EFFECT OF SIZE OF THE SPUNOFF UNIT WITH LODI ON SPINOFF SECURITY RETURNS

The fourth null hypothesis, $H4_0$, is "security excess returns of parent firms spinning off segments are not related to the interaction of the explanatory variables size and LODI." This hypothesis and the possible interaction effect of proportion of parent equity divested and LODI on the spinoff announcement reaction measure CAR (-1,0) is viewed two ways. First, the full model described in section 3.2.4 and variations of the model are used to assess $H4_0$.[16]

Table 15 displays the results of three different regression analyses. Panel A reflects the section 3.2.4 full model, i.e., CAR (-1,0) values regressed on size and LODI, with all size by LODI interaction terms. This model's test statistic is significant at the .0011 level. Note also the model's r-square is .2378 or .0577

[16] The full model is described in detail on page 34.

Table 15

Regression Analyses: CAR (-1,0) Regressed on Proportion of Parent Equity Spunoff and LODI; 79 Voluntary Spinoffs, 1980-1987[a]

	Panel A[a] All Interactions	Panel B Size by $LODI_1$ Dropped	Panel C No Interactions
Regression F Test Statistic	4.55	5.74	5.73
F Significance Level	.0011	.0004	.0014
CAR Mean	.0404	.0404	.0404
R-Square	.2378	.2369	.1865
Significance Levels of Coefficients:			
Intercept	.3173	.3192	.7741
Size	.3664	.0933	.0001[d]
$LODI_1$ Subgroup	.6709	.3730	.4473
$LODI_2$ Subgroup	.3652	.3840	.5877
Size by $LODI_1$	.7771	--	--
Size by $LODI_2$	.0560[b]	.0301[c]	--

[a]Related models reported in Table 7, size, and Table 14, disaggregation levels; Panel A reflects the full model of section 3.2.4.

[b]Approaching significance at the .05 significance level.

[c]Significance <.05.

[d]Highly significant.

larger than the corresponding value of the regression model using size only as the regressor variable (Table 7). However, the significance levels of each of the model's parameters relate nothing close to statistical significance except the coefficient of the size by $LODI_2$ interaction term. The significance level of this term's coefficient is .0560.

The next step in the analysis is to drop the term from the full model of Panel A that contributes the least. This is the size by $LODI_1$ interaction term. The regression results of the model reduced accordingly are those of Table 15, Panel B.[17] This model's test statistic is more significant than the full model and its r-square is just slightly lower. Now there is clearly significance of the coefficient of the size by $LODI_2$ interaction term. The Panel B results permit rejection of $H4_0$ in favor of the alternative hypothesis, "there is interaction between size of the segments spunoff and LODI." Recall $LODI_2$ consists of those spinoffs having FASB #14 required information available prior to spinoff announcement.

Panel C of Table 15 is included for comparison purposes. This model reflects the impact of size and disaggregation level on CAR (-1,0) without any interaction terms. The results closely parallel information reported in the preceding two sections of this chapter regarding the relationship of these

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[17] The size by $LODI_1$ interaction term was dropped from the Panel A regression model of Table 15 because of the significance of its coefficient (p-value = .7771). The appropriateness of this action was confirmed using an F test for comparing slopes of two regression lines. This F test is described in Ott (1984), page 519.

regressor variables and spinoff announcement excess returns. The primary benefit in presenting the no-interaction model lies in comparing its r-square of .1865 to the r-square of the Panel B model, .2369. This comparison shows that an additional 5% of the variability in spinoff announcement returns is explained by the presence of the size by $LODI_2$ interaction term.

The first paragraph of this section suggests a dual view of the interaction effects. A second look at the size-LODI interaction appears in Table 16. This table reflects the results of regressions of CAR (-1,0) on size only, but within each level of accounting disaggregation.

An examination of $LODI_2$ confirms the Table 15 results. This regression shows highly significant model and size coefficient test statistics. Also of note is the correlation between size and announcement excess returns within this grouping, .7113, and the high r-square of .5059. An interpretation of the latter value is 50.59% of the variation in announcement excess returns is explained by size, for spinoffs in $LODI_2$.

The size regressions for $LODI_1$ and $LODI_3$ from Table 16 are not statistically significant. This confirms that size and CAR (-1,0) are not significantly related for these disaggregation levels. This highlights an important separation by disaggregation level. That is, if the accounting information available prior to a spinoff announcement is other than that required by FASB #14, then size of the spinoff is not an important determinant of spinoff announcement returns.

Table 16

Regression Analyses: CAR (-1,0) Regressed on Proportion of Parent Equity Spunoff Within Each Disaggregation Level; Voluntary Spinoffs 1980-1987

Disaggregation Level	$LODI_1$	$LODI_2$	$LODI_3$
N, no. of observations	28	35	16
Regression F Test Statistic	1.128	33.786	1.906
F Significance Level	.2980	.0001[b]	.1891
CAR Mean[a]	.0479	.0393	.0299
R-Square	.0416	.5059	.1198
Size Coefficient T Test Statistic	1.062	5.813	1.380
T Significance Level	.2980	.0001[b]	.1891
Correlation of Size and CAR (-1,0)	.2040	.7113	.3461

[a]Reported in Tables 10 and 12.

[b]Highly significant.

In order to attempt to explain the results of Table 16, size information within each disaggregation level is closely scrutinized. Table 17 presents this data. No clear distinction for $LODI_2$ is apparent. Its size range is comparable to the range of the other two levels, its median size value is similar to that of $LODI_3$, and its percent of spinoffs in the largest quartile is not unlike percents for the other two levels.

Further observations concerning this section of chapter 4 may be helpful. First, analyses similar to those of Tables 15 and 16 were completed without statistical outliers. The results are not presented because they do not change the preceding discussion. Data related to the impact of statistical outliers on CAR (-1,0) for the entire sample were discussed in section 4.2 and presented in Table 6. Second, CAR (+1,+10) or postannouncement reaction measure regressions with interaction terms were studied. These models did not add to previous discussions from sections 4.3 and 4.4 regarding this CAR.[18]

The data and analysis of section 4.5 presented information to support rejection of $H4_0$. Interaction between proportion of parent equity value spunoff and accounting disaggregation levels exists. The r-square values of Table 15 show that interaction helps explain 5% more of the variation in CAR (-1,0), than is explained by spinoff size alone. Also, within the spinoffs classified as having

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[18] Recall section 4.3 including Table 7 indicates there is no relationship between size and CAR (+1,+10), and section 4.4 including Table 14 discusses the relationship between disaggregation levels and this value.

Table 17

Spinoff Transaction Proportion of Equity Value Spunoff Information by Three LODI; Voluntary Spinoffs, 1980-1987[a]

	Disaggregation Level		
Size Information	$LODI_1$, N=28	$LODI_2$, N=33	$LODI_3$, N=16
Minimum/Maximum Value	.003 to .783	.015 to .821	.005 to .844
Range	.780	.806	.839
Median	.265	.130	.124
Number of Spinoff Transactions in that Half of the Sample Having the Largest Spinoffs	17	15	5
Percent of Transactions in Largest Half	61%	45%	31%
Number of Spinoff Transactions in that Quartile of the Sample Having the Largest Spinoffs	7	9	3
Percent of Transactions in Largest Quartile	25%	27%	19%

[a]Size information for the sample as a whole is presented in Tables 2 and 8.

FASB #14 information available prior to spinoff announcement, an r-square of .5059 expresses the relationship between size and CAR (-1,0). Table 16 shows that the correlation between size and the announcement reaction measure within $LODI_2$ is .7113. Therefore, if a spinoff has FASB #14 information available prior to announcement, more than 50% of the variation in CAR (-1,0) can be explained by relative size of the spunoff unit. Alternatively, size information alone explains less than 20% of the variation in CAR (-1,0), i.e., when LODI are not considered.

The analysis of the excess returns in sections 4.2 through 4.5 assumes that the market model used to estimate these excess returns is stable over time. Since spinoffs change the structure of the parent firm in at least some way, this assumption may not be valid. Thus, the next section of this chapter contains an assessment of the stable market model assumption.

4.6 EXAMINATION OF MARKET MODEL/BETA STABILITY ASSUMPTION

To assess market model or beta stability, betas prior to the spinoff announcement were estimated and compared to beta estimates after the spinoff announcement. Parent firms with significant beta shifts were excluded from the sample, and key CAR values are recomputed and compared to similar values for the complete sample. Section 3.2.5 of the methodology chapter provides the specific details of the procedure.

To develop a beta estimate after the spinoff announcement, sufficient daily returns must exist prior to the ex-date or the first day the spunoff unit actually trades as a separate entity. Sufficient was defined as 30 or more trading days to correspond to the usual requirements of the Central Limit Theorem. Sixteen of this study's spinoff transactions did not have sufficient data to estimate a postannouncement market model, or did not have available CRSP returns information. Beta estimates before and after the spinoff announcement are compared for the remaining 63 sample transactions.

Of the 63 beta comparisons, only five had a beta shift significant at the 5% level, and none of these were significant at the 1% level. Comparisons of key CARs for the complete sample are shown in Table 18, Panel A, adjacent to corresponding values for the sample with significant beta shifts excluded. Visual inspection of the two different sets of CARs provides adequate assurance that the beta shift spinoff transactions do not seriously impair the findings of this study. The largest mean difference is only .0026 and the standard deviation differences are even smaller.

To be sure the 16 transactions for which comparisons could not be made did not bias the Panel A results, a second set of CARs was developed (see Table 16, Panel B). Subsample data in this panel include information for the complete sample excluding the 16 noncomparison spinoffs. These values are presented adjacent to like numbers for the subsample excluding the five spinoffs

Table 18

Cumulative Average Residuals (CARs) With and Without Transactions Experiencing a Significant Beta Shift; Voluntary Spinoffs, 1980-1987[a]

Panel A

	Complete Sample		Sample Without Shift Transactions[a]	
Time Period	CAR	Standard Dev.	CAR	Standard Deviation
-10 to -2	.0015	.0633	-.0011	.0628
-1 and 0	.0404	.0619	.0391	.0632
+1 to +10	-.0158	.0755	-.0178	.0760

Panel B

	Subsample[b]		Subsample Without Shift Transactions[a]	
Time Period	CAR	Standard Dev.	CAR	Standard Deviation
-10 to -2	.0046	.0659	.0015	.0657
-1 and 0	.0387	.0605	.0369	.0621
+1 to +10	-.0252	.0753	-.0285	.0755

[a]Five spinoff transactions experienced a significant postannouncement shift in beta.

[b]Subsample excludes 16 spinoff transactions for which pre- and post-beta comparisons could not be done.

experiencing a significant beta shift. Again, visual comparison shows that spinoffs with significant beta shifts did not have a meaningful impact.

This section of chapter 4 presents evidence that market model instability is not a deterrent to the analyses and discussion of results from earlier parts of the chapter.

Factors that could confound the results reported in this study are discussed in the next section of this chapter.

4.7 OTHER FACTORS THAT MIGHT INFLUENCE SPINOFF EXCESS RETURNS

This study explores accounting information effects and reiterates the importance of spinoff unit size on security returns. Other factors may influence these returns and/or confound the results presented in preceding sections of this chapter. This portion of chapter 4 examines the impact of some of these factors, especially their impact on conclusions regarding accounting disaggregation levels.

Prior spinoff studies have also examined sources of the excess returns associated with spinoff announcements other than size. Section 1.1 includes a brief review of these. Of the factors examined in prior studies, the basis for identification of all except one of them has been the stated rationale for the spinoff provided in the spinoff announcement. The exception is the wealth transfer from bondholders to shareholders argument that Schipper and Smith (1983) and Hite and Owers (1983) dismiss as a source of spinoff excess returns.

The spinoffs in this study are also categorized according to the stated reason offered in the announcement. They are also grouped according to information concerning the taxability of the spinoff dividend as presented in the announcement. Finally, information related to an inferred reason for some spinoffs is discussed.

4.7.1 Sources of Spinoff Security Returns Based on Stated Reason

The stated reasons for 54 of this study's 79 voluntary spinoffs are summarized in Table 19. In 25 instances the announcement did not include a motive for the spinoff. The three primary reasons for the spinoffs in this study are referred to as the EFFICIENCY, VALUATION, AND EQUITY reasons. The other stated reasons are not discussed beyond Table 19, because they occur infrequently.

CARs for spinoffs grouped by each primary reason and for the 25 spinoffs for which no reason was provided are presented in Table 20. For each group the table also shows the median size of the spinoff. Pertinent information for the complete sample is included for comparison purposes.

There are two questions of interest with respect to stated reasons. First, does this information confound earlier conclusions regarding accounting

Table 19

Reasons for Spinoffs Stated in Spinoff Announcement; 54 Voluntary Spinoffs, 1980-1987[a]

Reason		Number of Spinoffs Having Stated Reason
1. Separate very different operations; allow management to concentrate on core business; EFFICIENCY.		21
2. So stock prices would more closely reflect value of units; VALUATION.		13
3. Allow parent to more easily attain financing/raise capital; EQUITY.		11
4. Other; including developing spunoff unit too capital intensive (3), separate regulatory environments (2), and one each of four other reasons.[a]		9
	Subtotal	54
No reason given		25
	Total	79

[a]The four reasons offered once each include allowing stockholders to participate directly in cash flow from properties, to take advantage of one-time tax benefits, to avoid cyclical earnings fluctuation of spunoff unit, and to allow the parent company to pursue better investment opportunities.

Table 20

CARs by Reasons Stated in the Spinoff Announcement; Voluntary Spinoffs, 1980-1987

Description	Reason[a]			No Reason	Complete Sample
	EFFICIENCY	VALUATION	EQUITY		
No. of spinoffs	21	13	11	25	79
CAR (-1,0)	.0361	.0325	.0316	.0557	.0404
P-Value	.0038[c]	.0985	.0215[b]	.0023[c]	.0001[c]
CAR (+1,+10)	-.0194	-.0348	-.0133	-.0088	-.0158
P-Value	.1706	.1219	.7072	.5723	.0671
Median Size[d]	.206	.254	.197	.13	.139

[a]Reasons are described in the preceding table.

[b]Significance <.05.

[c]Highly significant.

[d]Using the proxy measure for the proportion of parent equity divested.

disaggregation levels? Second, does stated reason information help explain variation in spinoff security returns for the complete sample? Each of these questions is addressed in turn.

From section 4.4, primary observations regarding LODI include (a) no statistically significant difference in CAR (-1,0) by information level, and (b) a statistically significant difference in CAR (+1,+10) between $LODI_1$ and $LODI_3$.

To ascertain if stated reason information alters the preceding conclusions, CARs within each reason grouping are subdivided by LODI. Resultant values are presented in Tables 21 and 22. Information for the EQUITY reason is omitted because infrequency of spinoff transactions by LODI render its consideration virtually meaningless. Many of the numbers that are included in the tables are quite tentative for the same reason; i.e., few observations.

CAR (-1,0) comparisons by disaggregation level for the complete sample are included in Tables 10 and 12. Like comparisons of the Table 21 CAR (-1,0) values are completed within each stated reason. Though the results of the actual tests are not included, not one statistically significant difference was identified. Therefore, analysis based on stated reason information does not alter the conclusion that CAR (-1,0) differences by LODI are not statistically significant.

Regarding the postannouncement reaction measure, CAR (+1,+10), section 4.4 identifies a significant difference between $LODI_1$ and $LODI_3$ (Table 13). Comparisons of like values within stated reason groupings from Table 22 are

Table 21

CAR (-1,0) by LODI within Stated Reason and the No Reason Group; Voluntary Spinoffs, 1980-1987[a,b]

Reason	Accounting Disagg. Level[a]	N^b	CAR	Test Statistic	P-Value
	$LODI_1$	8	.0534	3.20	.0151
EFFICIENCY	$LODI_2$	11	.0242	1.44	.1815
	$LODI_3$	2	.0327	2.09	.2844
	$LODI_1$	4	-.0114	- .27	.8057
VALUATION	$LODI_2$	6	.0576	2.59	.0489
	$LODI_3$	3	.0411	1.75	.2214
	$LODI_1$	9	.0760	2.12	.0668
No Reason	$LODI_2$	11	.0491	2.18	.0546
	$LODI_3$	5	.0337	2.13	.1001

[a]Accounting disaggregation level information for the complete sample is shown in Tables 10 through 13.

[b]Small number of spinoffs limits interpretability in many instances.

Table 22

CAR (+1,+10) by LODI within Stated Reason and the No Reason Group; Voluntary Spinoffs, 1980-1987[a,b]

Reason	Accounting Disagg. Level[a]	N[b]	CAR	Test Statistic	P-Value
	$LODI_1$	8	-.0268	-1.20	.2709
EFFICIENCY	$LODI_2$	11	-.0267	-1.42	.1849
	$LODI_3$	2	.0498	2.06	.2876
	$LODI_1$	4	-.0936	-1.94	.1476
VALUATION	$LODI_2$	6	-.0019	- .08	.9394
	$LODI_3$	3	-.0221	-1.04	.4090
	$LODI_1$	9	-.0331	-1.10	.3033
No Reason	$LODI_2$	11	.0067	.28	.7833
	$LODI_3$	5	.0009	.05	.9638

[a]Accounting disaggregation level information for the complete sample is shown in Tables 10 through 13.

[b]Small number of spinoffs limits interpretability in many instances.

also made. That is, -.0268 is compared to .0498, -.0936 to -.0221, and -.0331 to .0009. Though the differences are considerable, they are not statistically significant even at the .10 level. However, at least one CAR (+1,+10) in each comparison has few observations suggesting the results are tentative. A conclusion is that stated reason information can alter/confound the significance of the CAR (+1,+10) differential noted in section 4.4.

Now the possible impact of stated reason information on spinoff security return variation for the complete sample is explored. Using the groupings by primary reason (three) and the group of spinoffs without a stated reason, a four-treatment analysis of variance (ANOVA) was carried out using first CAR (-1,0) and then CAR (+1,+10) values for the sample as dependent variables. Both analyses use the entire sample except that the spinoff transactions classified as "other" in Table 19 are excluded. There are nine spinoffs so classified.

The significance level of the F test statistic for the ANOVA examining the variation in CAR (-1,0) using reason treatments as the independent variable is .7675. This indicates the absence of an important relationship between reason groupings and spinoff CAR (-1,0) values in this study. The resulting F test statistic for the ANOVA examining the variation in CAR (+1,+10) has a significance level of .7270. The conclusion from these two analyses is that stated reasons for spinoffs are not related to spinoff security returns. Thus, the second question posed earlier is answered.

Differences between the stated reasons of this study and similar categorizations by Hite and Owers (1983) and Schipper and Smith (1983) are now examined. Hite and Owers classify merger facilitation as a stated reason for 12 of the spinoffs in their study, and legal or regulatory difficulties as a motivation for 19 others. Schipper and Smith assert that the motive for 18 of their spinoffs was to loosen constraints of institutional or regulatory environments, including taxation, price, or other regulation. Both of these prior studies involve spinoffs from 1963-1981. In this study of voluntary spinoffs from 1980 to 1987, only two announcements report spinoffs motivated by regulatory environment considerations, one mentions tax benefits, and no spinoff announcement offers a merger facilitation reason. Because of these differences some sources of spinoff security returns examined in prior studies are not investigated in this study.

4.7.2 Spinoff Security Returns and Taxability of the Spinoff Dividend

In addition to the stated reason, spinoff announcements sometimes contain information concerning the taxability of the spinoff dividend to the recipients. Categorizations of such information for each of the 79 spinoffs in this study are shown in Table 23.

In 43 instances, the taxability of the spinoff dividend was not mentioned in the initial spinoff announcement. The two remaining categories from Table 23

Table 23

Categories of Spinoff Dividend Taxability Information Available in Spinoff Announcements; 79 Voluntary Spinoffs, 1980-1987

Category	Number of Spinoffs
1. Dividend taxability to stockholders not mentioned in announcement or unknown; NOTHING.	43
2. Announcement states dividend is tax free.	15
3. Announcement states spinoff is conditional on a tax free ruling from the IRS.	10
4. Other; including stated taxable (5), expected tax free (5), and expected taxable (1).	11
Total	79

include spinoffs announced as tax free (15), and spinoffs conditional on the receipt of a tax free ruling from the IRS (10). Eleven spinoff announcements make other statements regarding the taxability of the spinoff dividend. These occurrences are too few to warrant separate categories and are not considered further.

CARs for spinoffs grouped by the three primary categories from Table 23 are displayed in Table 24. The categories are referred to as NOTHING, TAX FREE, and CONDITIONAL. For each category Table 24 also shows the median size of the spinoff. Information related to the complete sample is included for comparison purposes. Notice CAR (-1,0) for the NOTHING category is low compared to other CAR (-1,0) values displayed, and notice the differences in CAR (+1,+10) values.

As with the stated reason investigation in the preceding subsection of this chapter, there are two questions to be answered regarding the taxability categories. First, does taxability information confound earlier conclusions regarding accounting disaggregation levels? Second, does this information help explain variation in spinoff security returns for the complete sample? Each question is addressed in turn.

From section 4.4, the primary observations regarding LODI are (a) no statistically significant difference in CAR (-1,0) by information level, and (b) a statistically significant difference in CAR (+1,+10) between $LODI_1$ and $LODI_3$.

Table 24

CARs by Category of Spinoff Dividend Taxability Available in Announcement; Voluntary Spinoffs, 1980-1987

	Category[a]			
Description	NOTHING	TAX FREE	CONDITIONAL	Complete Sample
No. of Spinoffs	43	15	10	79
CAR (-1,0)	.0277	.0490	.0419	.0404
P-Value	.0004[c]	.0167[b]	.0869	.0001[c]
CAR (+1,+10)	-.0321	.0116	-.0131	-.0158
P-Value	.0141[b]	.5065	.4652	.0671
Median Size[d]	.137	.090	.303	.139

[a]See Table 23 for complete category descriptions.

[b]Significance <.05.

[c]Highly significant.

[d]Using proxy measure for the proportion of parent equity divested.

To determine if spinoff dividend taxability categories alter the preceding conclusions, CARs within each category are subdivided by accounting disaggregation level. The results are shown in Tables 25 and 26. Note that at least two LODI in the TAX FREE and CONDITIONAL categories have few observations. This limits the generalizability of conclusions concerning these categories.

CAR (-1,0) and CAR (+1,+10) comparisons by accounting disaggregation level are included in Tables 10 through 13 for the complete sample. Like comparisons of the CARs from Tables 25 and 26 are completed within taxability category. Though the results of the actual tests are not shown, not one statistically significant pairwise comparison is found for CAR (-1,0). Therefore, taxability categories do not seem to confound the conclusion that CAR (-1,0) differences by LODI are not statistically significant.

For CAR (+1,+10) section 4.4 identifies a statistically significant difference between $LODI_1$ and $LODI_3$ for the complete sample (Table 13). Corresponding comparisons of these disaggregation levels within taxability categories result in one significant difference out of three. In the NOTHING category -.0579 is significantly different from .0081 at the .0187 level. Comparisons for the other two taxability categories are not significant, but involve too few observations to provide conclusive contradictory evidence. A conclusion is that taxability categories possibly confound the observation that CAR (+1,+10) for spinoffs in

Table 25

CAR (-1,0) by LODI within Category of Spinoff Dividend Taxability; Voluntary Spinoffs, 1980-1987[a,b]

Category	Accounting Disagg. Level[a]	N[b]	CAR	Test Statistic	P-Value
NOTHING	$LODI_1$	16	.0284	1.93	.0727
	$LODI_2$	16	.0301	2.73	.0155
	$LODI_3$	11	.0234	2.38	.0388
TAX FREE	$LODI_1$	4	.0184	.91	.4297
	$LODI_2$	9	.0552	1.96	.0854
	$LODI_3$	2	.0822	19.22	.0331
CONDITIONAL	$LODI_1$	2	.1173	3.29	.1879
	$LODI_2$	5	.0258	.78	.4771
	$LODI_3$	3	.0187	.68	.5646

[a]Accounting disaggregation level information for the complete sample is shown in Tables 10 through 13.

[b]Small number of spinoffs limits interpretability in many instances.

Table 26

CAR (+1,+10) by LODI within Category of Spinoff Dividend Taxability; Voluntary Spinoffs, 1980-1987[a,b]

Category	Accounting Disagg. Level[a]	N[b]	CAR	Test Statistic	P-Value
NOTHING	$LODI_1$	16	-.0579	-2.54	.0227
	$LODI_2$	16	-.0340	-1.57	.1376
	$LODI_3$	11	.0081	.65	.5315
TAX FREE	$LODI_1$	4	.0025	.08	.9391
	$LODI_2$	9	.0207	.80	.4441
	$LODI_3$	2	-.0114	-1.14	.4573
CONDITIONAL	$LODI_1$	2	-.0281	-1.35	.4070
	$LODI_2$	5	-.0264	- .91	.4150
	$LODI_3$	3	.0189	.69	.5640

[a]Accounting disaggregation level information for the complete sample is shown in Tables 10 through 13.

[b]Small number of spinoffs limits interpretability in many instances.

this study is significantly different for $LODI_1$ compared to $LODI_3$. Contrary evidence, however, is very tentative.

The relationship between spinoff security returns and taxability categories exclusive of LODI is considered. Using the three taxability categories as treatments, two ANOVAs were done: one using CAR (-1,0) values as the dependent variable and the other using CAR (+1,+10) values. In both analyses only the 11 spinoffs in the "other" grouping from Table 23 were excluded from the complete sample.

The significance level of the F test statistic for the first ANOVA is .4103 and the F test statistic for the second ANOVA is .1571. Therefore, no evidence exists to suggest a relationship between information about the taxability of the spinoff dividend provided in spinoff announcements and spinoff security returns.

4.7.3 Spinoff Security Returns and Inferred Reasons

The last effort to identify sources of spinoff security returns in this study involves an attempt to find reasons for spinoffs different from those stated in spinoff announcements. Company-specific press releases before and after the initial spinoff announcement were reviewed and, where possible, reasons for spinoffs are inferred from them. Differences between inferred and stated reasons are noted in 23 instances.

The 23 inferred reasons include eliminating a loser, i.e., a unit having low earnings and/or detracting from the parent company's financial statements (13 spinoffs); separating very divergent operations (4 spinoffs); and discouraging an unfriendly takeover (3 spinoffs). Three other reasons occur once each. Only the first mentioned loser group is noted frequently enough to merit further discussion.

CARs for the subsample of 13 "loser" spinoffs divested because of low earnings, or because they detract from the parent company's financial statements, are computed and compared to CARs for the other 66 spinoffs in the study. The announcement reaction, CAR (-1,0), for the 13 spinoff subsample is .1% and is not significant, while the comparable value for the other 66 spinoffs is 4.44% and is significant at the .0001 level. Furthermore, the difference between these CAR (-1,0) values is significant at the .05 level. Neither the postannouncement reaction measure nor the preannouncement reaction measure for the 13 spinoff subsample is statistically significant. They are also not significantly different from like values for the remainder of the sample.

The 13 spinoff subsample size range varies from .004% to 53.9% of the parent company's pre-spinoff equity. The median size is 8.3%. Also, at least four of these 13 "loser" spinoffs belong to each of this study's three accounting disaggregation levels.

The limited evidence presented in the preceding paragraphs suggests that the financial condition and/or the earnings of the spunoff unit may be a determinant of excess returns for spinoffs.

The next and final section of chapter 4 examines security return reactions to the date on which documents related to spinoffs are required to be filed with the SEC.

4.8 Market Reaction to SEC Filing Date

Earlier sections of chapter 4 examine security reactions around the date of first mention of the spinoff announcement. However, the market reaction to the date on which documents related to spinoffs are first filed with the SEC is also of interest, because this date represents the first formal, publicly available description of the spinoff unit as a separate trading entity. The filing date almost always follows the announcement date, although in three of 79 instances the two dates are the same.

The filing dates for SEC documents for spinoff transactions are obtainable from the SEC in Washington, D.C., albeit at considerable time and/or expense. Alternatively, such information is sometimes included in press releases accessible from *Dow Jones News Wire and the Broadtape Transcripts*, SEC 10-K reports, or company annual reports. Before attempting to acquire filing dates from the first and primary source, available information from alternative secondary sources was examined.

Filing dates for 33 of this study's 79 spinoffs were obtained from secondary sources. Table 27 presents the security returns related to filing dates for these 33 spinoffs. Day 0 in the table is the document filing date.

The resultant return information clearly shows there is not a market reaction to filing dates for this subsample which represents 42% of the spinoffs in this study. On the basis of cost considerations and time requirements necessary to secure filing dates for the complete sample from primary sources, information was not obtained for the other 46 spinoffs. Therefore, based on the information shown, the conclusion is that there is no significant market reaction on the date that documents related to spinoffs are filed with the SEC.

This completes the results chapter of this study of 79 voluntary spinoffs. Chapter 5 provides a summary of the results, a discussion of contributions, limitations, and suggestions for further research.

Table 27

Average Security Returns, Cumulative Average Residuals (CARs), and P-Values[a] Related to SEC Filing Dates; Subsample of 33 Spinoffs, 1980-1987

Average Security Returns, ARs

Day	AR	T Statistic	Probability >|T|[a]
-1	.0024	.51	.6122
0[b]	.0004	.09	.9259
+1	.0019	.30	.7649

Cumulative Average Residuals, CARs

Time Period	CAR	T Statistic	Probability >|T|[a]
-1 and 0	.0028	.41	.6862
0 and +1	.0023	.28	.7786
-1 to +1	.0047	.44	.6599

[a]Significance level.

[b]Day 0 is the filing date.

CHAPTER 5

SUMMARY OF RESULTS, CONTRIBUTIONS, LIMITATIONS, AND CONCLUDING REMARKS

5.1 PURPOSE/CONTENT

This chapter highlights the entire study. First the results are summarized. Second, the results are related to prior research findings by highlighting collaborating and conflicting evidence, and by suggesting possible extensions of this study. Next, factors limiting the conclusiveness or generalizability of the study's results are reviewed. Finally, some concluding remarks, including suggestions for further research, are provided.

5.2 SUMMARY OF RESULTS

The primary purpose of this study was to examine the relationship between spinoff security returns and varying levels of disaggregated accounting information of the spinoff unit available prior to spinoff announcement. Also examined was the relationship between the variation in spinoff security returns and LODI. Other factors that could impact spinoff excess returns and/or confound the conclusions concerning accounting disaggregation levels were also explored. In addition, the stable beta assumption inherent to the market model that is used to estimate security returns was addressed with respect to the study's overall results. Also, the market reaction on the date that spinoff documents are filed with the SEC was examined.

The results related to the spinoff announcement reaction, CAR (-1,0), are reviewed first.

The excess announcement return for the spinoffs in this study is highly significant and positive confirming similar results from earlier spinoff studies. The proportion of parent equity divested, or spinoff size, is also found to have a significant relationship to CAR (-1,0). This finding also confirms results from prior studies. In this study, spinoff size accounts for slightly less than one-fifth of the variation in CAR (-1,0), and large spinoffs have a significantly larger and more varied reaction than small spinoffs.

Accounting disaggregation levels, based on accounting information available for the spunoff units prior to announcement, do not have a significant relationship to CAR (-1,0). Spinoffs in the disaggregation group representing the least amount of preannouncement accounting information do experience a larger announcement reaction, but differences from other disaggregation levels are not significant. However, the variance of CAR (-1,0) values for the spinoffs having the most accounting information available prior to the spinoff announcement is significantly smaller than the variance of CAR (-1,0) for spinoffs having the least accounting information available prior to the spinoff.

Interaction between spinoff size and levels of disaggregated information available prior to the announcement has a significant impact on CAR (-1,0). This interaction explains approximately 5% more of the variation in the announcement reaction than is explained by size alone. A very important observation is that size has a significant relationship to CAR (-1,0) only for spinoffs having FASB #14 information available prior to the spinoff announcement. This could have something to do with the ways investors assess segment performance using FASB #14 segment data. This is a qualification of the research findings related to overall size effects mentioned earlier in this summary.

Results related to investigations of spinoff preannouncement returns, CAR (-10,-2), and postannouncement returns, CAR (+1,+10), are now reviewed.

The preannouncement security return for the spinoffs in this study is virtually zero. The postannouncement security return for the spinoffs in this study is borderline significant and negative. This result is similar to findings reported in prior studies. Spinoff unit size is not related to the postannouncement return.

Overall, a significant relationship does not exist between CAR (+1,+10) and accounting disaggregation level. However, spinoffs having the least accounting information available prior to the announcement (the study's $LODI_1$)

experience a significant, negative CAR (+1,+10), that is significantly different from CAR (+1,+10) for spinoffs having the most accounting information available prior to the announcement (the study's $LODI_3$). Significant differences between CAR (+1,+10) variances also exist when disaggregation levels are compared. These variances are largest for $LODI_1$ spinoffs and smallest for $LODI_3$ spinoffs.

Interaction of size and disaggregation level analysis did not help explain variation in the postannouncement security return.

The results of this study were examined for possible qualifications due to statistical outliers, very large spinoffs (upper decile), and beta instability. These examinations did not provide bases for qualifying the primary research findings.

Spinoffs in this study were first grouped on the basis of stated reason for the divestiture, and then by information regarding the taxability of spinoff dividends to recipients. The source of information for both groupings was spinoff announcements. Neither grouping helped explain variation in this study's spinoff announcement return, or the postannouncement reaction measure. Evidence does seem to indicate that both groupings confound results related to accounting disaggregation level and CAR (+1,+10), though evidence is not conclusive.

An attempt was also made to infer the real reason for spinoffs where differences from stated reasons seemed obvious. Results from an examination of a 13 spinoff subsample indicate a very low and insignificant, positive announcement reaction to divestitures undertaken either because of low spinoff unit earnings, or because the unit negatively impacts the financial statements of the parent company. Since only 13 spinoffs were included in this investigation, no attempt to relate these results to other information in the study was attempted.

Finally, the market reaction to the date that documents related to spinoffs are filed with the SEC (filing date) was investigated for a subsample of the spinoffs in this study. The average security returns for this subsample were insignificant the day before the filing date, on the filing date, and the day after the filing date. The lowest significance level in this three-day period was only .6122.

5.3 CONTRIBUTIONS

Prior spinoff studies suggested that new information sources may be related to observed excess returns resulting from spinoff announcements, but they did not investigate that possibility. The main contribution of this study is the investigation of the relationship between spinoffs categorized by levels of disaggregated information and spinoff security returns using a 1980-1987 sample of voluntary spinoffs.

Collaborating evidence includes documentation that spinoffs continue to experience significant announcement excess returns, that the proportion of parent company equity divested remains an important determinant of these returns, and that the postannouncement reaction is negative but not significant. This study's spinoffs are larger than samples examined in prior studies based on the proportion of parent company equity divested. Also, stated reasons for spinoffs offered in announcements seem to have changed over time. Merger facilitation and legal or regulatory difficulties were frequently the stated reasons for spinoffs in prior studies. These stated reasons were not frequently offered for this study's spinoffs.

Several research extensions are included in this study. Accounting information effects, based on measurement of the market reaction to spinoffs having varying levels of accounting information available prior to the announcement, are not significantly related to spinoff announcement excess returns. However, the interaction of varying levels of accounting information with spinoff size helps explain a greater portion of the variation in announcement returns and, most importantly, it permits a qualification of the size/announcement excess returns relationship. That is, evidence from this study shows that size is only related to spinoff announcement returns when spinoffs have FASB #14 segment information available prior to the spinoff announcement.

Additionally, this dissertation provides evidence that collaborates LOB research in a new setting. LODI are not related to spinoff announcement excess returns, but are related to differences in the variations of these returns. When spinoffs have less than FASB #14 information available prior to spinoff announcement, variations in the announcement returns are significantly larger than variations for spinoffs having more than FASB #14 information available prior to spinoff announcement. The preceding findings complement the results of Ajinkya (1980) who investigated the market reaction to SEC disclosure requirements. Ajinkya's results indicate that disclosure differences are not related to mean returns, but are related to assessments of the distributions of the mean returns; i.e., more disclosure increased consensus in the risk-return assessments of securities. Assuming decreased variation in announcement returns indicates increased consensus in security assessments, the findings of this dissertation closely parallel Ajinkya's findings.

Another extension involves the relationship between spinoff postannouncement returns and varying levels of accounting information available prior to the spinoff. That is, spinoff units having little prior accounting information available were found to experience significant negative postannouncement returns. This is not true for spinoffs having at least segment information available prior to the spinoff.

The study also provides evidence that spinoffs with little accounting information available prior to the spinoff announcement tend to experience more varied postannouncement returns than do spinoffs with at least the basic segment information available prior to the spinoff.

The classification of spinoffs based on information provided in spinoff announcements concerning reasons for the spinoff and taxability of the spinoff dividend does not help explain spinoff security returns. The relationship of spinoff returns to taxability information is examined for the first time in this study.

5.4 LIMITATIONS

Sample size considerations are a limitation of this study. The primary analyses affected by sample size are those that relate to the stated reasons for spinoffs and spinoff dividend taxability. In these analyses (section 4.7) no relationship to spinoff excess returns was found, but the small number of spinoffs in some of the groupings associated with each analysis surely limits the conclusiveness of the findings. Furthermore, attempts to determine if stated reasons and categories of spinoff dividend taxability confound results related to accounting disaggregation levels lead to further subdivisions of groupings. That is, the groupings within each possible confounding factor are subdivided by the three accounting disaggregation levels. Some resultant subgroupings have as few as two spinoffs. Therefore, conclusions regarding effects of stated reason or spinoff dividend taxability on accounting disaggregation level results are very tentative.

Another limitation is inherent in the focus on the positive spinoff announcement excess return. This study, as well as prior spinoff studies, includes spinoffs whose announcement reactions are negative. A subsample of 19 such spinoffs exists among the 79 spinoffs examined here, and no attempt was made to analyze them separately.

5.5 CONCLUDING REMARKS

A suggested source of spinoff announcement excess returns not investigated previously was examined in this study. Differing levels of accounting information resulting from spinoffs do not prove to be a source of these returns. However, this investigation of spinoffs grouped by levels of accounting information resulting from spinoffs does show that levels of accounting information identify significant differences in the variation of spinoff announcement returns and that spinoff announcement excess returns will largely be reversed in the ten days following the announcement when prespinoff accounting information is minimal or nonexistent. The variation difference finding complements prior LOB research, and the announcement return reversal finding suggests that future research relates these results to the Bernard and Thomas (1989) investigation of "post-earnings-announcement" drift. It is also clear that the relationship between the proportion of parent equity divested and spinoff excess returns is affected by levels of accounting information available for the spunoff units.

Investigation of varied information available in spinoff announcements, including the stated reasons for spinoffs and the taxability of spinoff dividends, did not help explain spinoff announcement excess returns. A tentative conclusion is that information available in spinoff announcements does not identify variables that are related to spinoff announcement excess returns.

Spinoff announcement excess returns remain largely unexplained. In fact, approximately three-fourths of the variation in them is due to unknown factors. Further research related to spinoffs might compare the spunoff unit's prespinoff performance to announcement excess returns. A cursory subsample of 13 spinoffs in this study identified as negatively affecting the parent company's financial statements experienced a very different announcement return than the other spinoffs in the study. Also, future research should try to explain the negative announcement returns experienced by some spinoffs, and determine if levels of disaggregated information are related to the sign (+ or -) of the spinoff announcement return.

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APPENDIX A

Parent Firms Spinning Off Units; Voluntary Spinoffs 1980-1987

	COMPANY NAME	EVENT DATE	SIC CODE
1.	ACTON CORP	5/81	4899
2.	ADAMS-RUSSELL CO INC	6/86	3662
3.	ALLEGHANY CORP	2/87	6611
4.	AMERICAN NATURAL RESOURCES CO	9/80	4923
5.	AMOCO CORP	1/85	6711
6.	ASTREX CORP	1/82	5065
7.	BAIRNCO CORP	1/84	6711
8.	BEARD OIL CO	11/83	1311
9.	BORG WARNER CORP	7/85	2821
10.	BSN CORP	12/83	5699
11.	CALTON INC	1/87	1521
12.	CENTEX CORP	2/84	1531
13.	CENTRAL LOUISIANA ENERGY CORP	6/81	4923
14.	CHELSEA INDUSTRIES INC	1/82	2211
15.	COASTAL CORP	5/80	4923
16.	COOPER LABORATORIES INC	9/83	2834
17.	COPPERWELD CORP	5/86	3316
18.	CRANE CO	4/85	3494
19.	DATAPOINT CORP	4/85	3573
20.	DORCHESTER GAS CORP	6/82	1311
21.	EDISON BROTHERS STORES	4/85	5661
22.	ENGLEHARD MINERALS & CHEMICALS CORP	3/81	5051
23.	ESI INDUSTRIES INC	7/86	1382
24.	FEDDERS CORP	3/86	3714
25.	FLORIDA DOCK INDUSTRIES	3/86	3273
26.	FUQUA INDUSTRIES INC	9/80	3732
27.	GATX CORP	2/83	3743
28.	GULF CANADA RESOURCES LTD	1/87	1311
29.	HAZLETON LABORATORIES INC	12/85	7391
30.	HI-SHEAR INDUSTRIES	4/84	3452
31.	HOUSTON OIL & MINERALS CORP	9/80	1311
32.	ITEK CORP	7/81	3861
33.	IU INTERNATIONAL CORP	8/83	6711
34.	KANEB SERVICES	6/81	1211
35.	KAY CORP	4/86	5944
36.	KEYSTONE CONSOLIDATED INDUSTRIES INC	2/84	3496
37.	KEYSTONE INTERNATIONAL INC	7/83	3494
38.	KN ENERGY INC	10/83	4923
39.	KN ENERGY INC	5/84	4923
40.	KRAFT INC	9/86	2022
41.	LOUISIANA LAND & EXPLORATION CO	4/83	1311
42.	MASCO CORP	3/84	3432
43.	MASS MERCHANDISERS INC	8/83	5013
44.	MCA INC	3/82	7813

	COMPANY NAME	EVENT DATE	SIC CODE
45.	MEDICORE INC	6/86	8081
46.	MESA PETROLEUM CO	10/82	1311
47.	MOOG INC	6/83	3494
48.	NEWHALL LAND & FARMING CO CAL	7/82	6711
49.	NEWMONT MINING CORP	9/86	1382
50.	OGDEN CORP	9/83	3356
51.	PEABODY INTERNATIONAL CORP	7/80	3569
52.	PENN CENTRAL CORP	3/87	4011
53.	PEOPLES ENERGY CORP	1/81	4923
54.	PERINI CORP	2/83	1629
55.	PHILADELPHIA SUBURBAN CORP	5/80	4941
55.	PIER 1 INC	1/85	5712
57.	PIONEER CORP	10/83	4922
58.	PLANTRONICS INC	5/84	3661
59.	POPE & TALBOT INC	10/85	2421
60.	RJ REYNOLDS INDUSTRIES INC	8/83	6711
61.	RLC CORP	1/82	7512
62.	ROLLINS INC	12/83	7342
63.	SINGER CO	2/86	3636
64.	SOUTHLAND ROYALTY CO	6/80	6792
65.	SPARKMAN ENERGY CORP	5/83	4922
66.	SQUIBB CORP	7/86	2834
67.	STANDEX INTERNATIONAL CORP	9/81	2751
68.	STANDEX INTERNATIONAL CORP	9/82	2751
69.	TANDY CORP	6/86	5732
70.	TELEDYNE INC	1/84	3662
71.	TELEDYNE INC	7/86	3662
72.	TEXAS GAS RESOURCES	2/83	4922
73.	TEXAS INTERNATIONAL CO	2/82	1311
74.	TRANSWORLD CORP	9/83	4511
75.	TUCSON ELECTRIC POWER	12/84	4911
76.	UNIVAR CORP	9/83	2833
77.	UNIVAR CORP	12/85	2833
78.	UNIVERSITY PATENTS INC	3/86	6794
79.	URS CORP	8/82	8911

APPENDIX B

Examples of Spinoffs by LODI

$LODI_1$: Available accounting information for the spunoff unit prior to the spinoff announcement was less than that required by FASB #14.

Example A: Parent - Datapoint Corp.
Spunoff Unit - Intelogic Trace
Why subgroup 1 - Spunoff unit represents domestic customer service which was not a reported segment of the parent.

Example B: Parent - Fedders Corp.
Spunoff Unit - Nycor
Why subgroup 1 - Parent operations represent only one industry; i.e., parent did not report for separate segments.

$LODI_2$: Only the five items required by FASB #14 are reported for the spunoff segment prior to the spinoff announcement.

Example A: Parent - Edison Brothers Stores
Spunoff Unit - Handyman
Why subgroup 2 - Handyman was the parent's home improvement operation and a reported segment.

Example B: Parent - Hazleton Laboratories Inc.
Spunoff Unit - Kirschner Medical Corp.
Why subgroup 2 - Kirschner was the parent's medical products/instruments operation and a reported segment.

$LODI_3$: Available accounting information for the spunoff unit prior to the spinoff announcement exceeded that required by FASB #14.

Example A: Parent - Kay Corp.
Spunoff Unit - Kay Jewelers
Why subgroup 3 - Kay Jewelers was 19.6% publicly owned prior to the spinoff announcement, therefore complete financial statements for Kay Jewelers were available prior to the announcement.

Example B: Parent - Central Louisiana Energy Corp.
Spunoff Unit - Central Louisiana Electric
Why subgroup 3 - Spunoff unit was a public utility and reported accounting information exceeded FASB #14 required information.

APPENDIX C

Paired Comparison Procedures[19]

To compare means of two samples with sample sizes n_1 and n_2 having means $\bar{x}_1$ and $\bar{x}_2$ and variances s_1^2 and s_2^2, an F test is first used to test the hypothesis of equal sample variances. The F test statistic is:

$$F_{dnum,dden} = \frac{\text{larger of } S_1^2, S_2^2}{\text{smaller of } S_1^2, S_2^2}$$

where dnum = $(n_1$-1) if s_1^2 is > s_2^2 or $(n_2$-1)

and dden = $(n_1$-1) if s_1^2 is < s_2^2 or $(n_2$-1)

Then a T test is used to test the hypothesis of equal means. Under the assumption of equal variances the T test statistic is:

$$t_{n_1+n_2-2} = \frac{\overline{x_1} - \overline{x_2}}{\sqrt{s^2(1/n_1 + 1/n_2)}}$$

Where s^2 is a pooled variance given by,

$$s^2 = \frac{(n_1-1)s_1^2 + (n_2-1)s_2^2}{n_1+n_2-2}$$

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19 Source: *SAS User's Guide: Statistics*, Version 5, PROC TTEST.

Under the assumption of unequal variances the T test statistic is:

$$t_n = \frac{\overline{x_1} - \overline{x_2}}{\sqrt{s_1^2/n_1 + s_2^2/n_2}}$$

where n is a pooled degrees of freedom given by,

$$n = \frac{(s_1^2/n_1 + s_2^2/n_2)^2}{(s_1^2/n_1)^2/(n_1 - 1) + (s_2^2/n_2)^2/(n_2 - 1)}$$

APPENDIX D

Event Date Specification Steps

To specify event dates for the parent firms spinning off segments, the following steps were used for each firm after accessing *Dow Jones News Wire and the Broadtape Transcripts* (DJN). Virginia Polytechnic Institute and State University subscribes to DJN service. The service is accessible using a modem with almost any terminal.

1. Search DJN by firm and year. An example of a search command for Datapoint Corp. which has the stock symbol DPT is, "YR85 and DPT.CO." This primary command identifies all documents on DJN concerning Datapoint Corp. for the year 1985.
2. "Scroll" through all documents until a document announcing an intention to spinoff a subsidiary is located. The documents are in order by date and the "scroll" procedure is menu driven.
3. Once a specific document is identified, use its month, day and year and search all documents for the firm of interest for the preceding 12 months to be sure the identified document is the first mention of the intention to divest. If earlier documents are located, search one year prior to the date of the earlier document. Search of a partial year is easily accomplished after using the primary command referred to above. For example, the

command "..LIMIT/1 DD LT 850701" identifies all documents for Datapoint Corp. dated before July 1, 1985 when used after command 1, "YR85 and DPT.CO." LT indicates "less than" in the above.

4. After location of the earliest document, or the event document, check the time the document appeared on DJN. Time is included in the document, often near the end of the document's text. If the time is earlier than 4:30 p.m., market closing time, and the date of the event document is a trading day, then that date is the event date. If the time is 4:30 p.m. or after, and the day after the date of the event document is a trading day, then the day after is the event date. If the date of the event document is not a trading day, the event date is the first trading day after the date of the event document. Trading days are available on CRSP.

5. After event date specification, search all documents in the event window to check for announcements that could confound the results of the study. DJN has a "CAPTURE" feature permitting easy downloading of documents to a floppy disk.

6. Download, print, and closely scrutinize all documents in the event window.

During the preceding process sample qualifications (see page 38) were noted where applicable.

VITA

George Alfred Johnson
Department of Accounting & Finance
Box 5755
Radford University
Radford, VA 24142

EDUCATION	B.A., 1970 Kent State University Major: Sociology
	MBA, 1978 Virginia Polytechnic Institute & State University
	Ph.D., 1990 Virginia Polytechnic Institute & State University Major: Accounting
TEACHING EXPERIENCE	Instructor, 1983-1987 Virginia Polytechnic Institute & State University
	Assistant Professor, 1987-present Radford University
PERSONAL	Born July 26, 1948 Married with two daughters

George Alfred Johnson