

## Selecting the Key to Unlock Hidden Value\*

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## ABSTRACT

Firms can choose to restructure by using a carve-out, sell-off, spin-off, or exchange, or by issuing tracking stock. The purpose of this study is to determine how firms choose among these methods when restructuring to "unlock value." Using a sample of Compustat firms during the period from 1990-1999, I estimate the joint likelihood that a firm will restructure and the likelihood it will raise external capital. I find that firms are more likely to restructure only or restructure and raise capital as the percentage of unrelated segments increases, as the abnormal industry sales decrease, as firm size increases, and as the firm's current ratio decreases. In addition, the likelihood of restructuring and raising capital increases as the firm's leverage ratio increases. The probability that the firm will only restructure is negatively related to the firm's growth rate and return on assets and positively related to the number of segments and the firm's free cash flows. Finally, I find evidence that the restructuring and need for capital decisions should be considered simultaneously. Conditional on the estimated probabilities, I estimate logit equations to determine how restructuring choices are made. I find that the likelihood of choosing a spin-off or issuing tracking stock rather than an exchange increases when the segment is unrelated and as the probability of only restructuring decreases. This is consistent with firms having the capacity to use means other than restructuring to raise cash. As the probability of restructuring only decreases, exchanges, tracking stock issues, or sell-offs are more likely to occur than carve-outs. In addition, segments that experience growth in sales are more likely to be carved-out than exchanged or sold-off. Firms are more likely to choose a sell-off rather than issue tracking stock, or exchange or carve-out a segment when leverage ratios are increasing, the firm's growth is decreasing, and the probability of restructuring only decreases. This is consistent with the notion that firms look to sell-off assets as a way to raise cash to pay off existing debt or because additional debt issues are too costly.

## 1 Introduction

During the 1980's and 1990's firms engaged in a variety of types of divestitures to reduce the level of diversification.<sup>1</sup> Restructuring options include spin-offs, carve-outs, sell-offs, exchanges, and, more recently, issuing tracking stock. This study analyzes a sample of 6,053 firms, of which 1,844 restructure at least once over the ten year period from 1990 to 1999. There were 133 equity carve-outs, 208 spin-offs, 3,922 asset sell-offs, 199 exchanges, and 15 tracking stock issues. In addition, there were more than 3,100 issues of debt or equity by these firms.

The purpose of this study is to empirically model the firm's choice of restructuring method. Previous literature has focused on the causes of corporate restructuring and the short and long-term effects of the restructuring method used. For example, Berger and Ofek (1999) show that firms with the greatest value loss due to diversification are the most likely to have divestitures. They also show that management turnover, outside pressure, changes in compensation policies, and financial distress generally precede restructuring decisions. Powers (2001) shows that the parent firm's need for capital and the quality of the division being divested are the primary factors determining whether a spin-off, carve-out, or sell-off is chosen.

I add to the literature by examining the decision to restructure conditional and the decision to raise external capital simultaneously.<sup>2</sup> While previous literature examines the reasons that corporations restructure and the impact of the decision to raise external

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<sup>1</sup> Blanton, Perret, and Taino (2000) note that transactions that unlocked value via spin-offs, split-offs, carve-outs and tracking stock increased dramatically in the 80s and 90s and that this was influenced by the bull market, an increased desire for pure plays, and the shift away from conglomerates. }

<sup>2</sup> Throughout this study restructuring refers to reducing the number of business segments via a carve-out, spin-off, sell-off, or exchange or an issuance of tracking stock.

capital on the method of restructuring selected, it does not consider the joint decision. Specifically, previous literature has not analyzed the effect of a joint decision to restructure and raise external capital and the impact of this decision on the restructuring method chosen. According to Myers (1984) pecking order theory, firms prefer internal to external financing and debt to equity. In this study, I propose that capital raised by restructuring can be used as an alternative to issuing debt or equity when internal funds are too low.

If the likelihood of restructuring and the likelihood of raising external capital are significant factors in the decision process, previous models will have inconsistent and biased coefficients due to an omitted variable problem. These issues are relevant because the opportunity set of restructuring choices is not the same if the firm wants to both raise capital and restructure versus simply restructure. With a carve-out, sell-off, and in some cases an issue of tracking stock and an exchange, new equity capital is raised. In contrast, a spin-off and some issues of tracking stock are accomplished through a pro-rata distribution of shares. In the case of an exchange, the segment is divested in exchange for shares in the acquiring firm, or for assets of the acquiring firm, and capital is raised only if the firm sells the shares or assets received in the exchange.

Figure 1 illustrates the different opportunity sets available to the firm. If the firm wants to raise capital, a spin-off would not be a restructuring choice since no capital is raised; however, if the firm does not want to raise capital, then a firm is less likely to consider a carve-out or an asset sell-off as a viable method of restructuring. In the case of an exchange the firm can decide to sell the shares or assets exchanged, so an exchange is

an option whether or not there is a need to raise capital. Likewise, tracking stock can be distributed through a pro-rata distribution or through an initial public offering, so issuing tracking stock is also an option whether or not the firm wants to raise capital. Examining the restructuring and financing decisions jointly, and conditioning the restructuring method chosen on the likelihood that the parent firm restructures and raises capital and the likelihood that the firm chooses only to restructure enhances our understanding of the restructuring choice.

Several reasons for restructuring have been proposed in the literature. Parent firms may be attempting to reduce inefficiencies, improve managerial incentives, or improve the efficiency of the internal capital market.<sup>3</sup> If the firm has a strong internal capital market it will not need to access the external capital markets as often as firms without a strong internal capital market. An issue of tracking stock, or possibly a carve-out, where the firm retains a majority interest, helps to preserve the firm's internal capital market. Reducing inefficiencies, improving managerial incentives, and improving the efficiency of the internal capital market, if accomplished, should lead to increased value for the parent firm. By divesting segments, the information asymmetry regarding that segment, as well as the remaining segments, is reduced, allowing the market the opportunity to more accurately value the units or “unlock hidden value.” Consistent with Blanton, Perrett, and Taino (2000) I assume that firms restructure to “unlock value” in divisions which in turn results in the increased value of the parent.

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<sup>3</sup> See Williamson (1967) for a discussion on the reduction of inefficiencies, Diamond and Verrecchia (1982) for a discussion of improving managerial inefficiencies, and Scharfstein and Stein (2000) for an analysis of improving the efficiency of the internal capital market.

Using a sample of all non-financial firms reported on the Compustat database for the period from 1990 to 1999, I jointly estimate the likelihood that a parent firm will restructure and the likelihood that it will raise external capital. It is not clear if the decision to restructure precedes the decision to raise external capital or vice versa. For example, in the announcement of the sale of its plastics division, a representative for Johnson Controls stated that the completion of the transaction would allow the firm to forego a secondary stock issue which had been under consideration.<sup>4</sup> To address the uncertainty of causality, I estimate a multinomial logit equation and derive conditional probabilities for restructuring and for raising external capital. The conditional probabilities allow me to analyze the degree to which one decision impacts the other. Then, conditional on the joint probabilities from stage one, I estimate a series of logit equations to measure the determinants of the restructuring choice. This model is estimated for the period from 1990 to 1999.

The five choices for restructuring have many common characteristics. For example, both carve-outs and spin-offs create a new entity. If the divested entity is unrelated to the core business of the parent, the end result will be a reduction in inefficiencies because the management will be in control of assets that they are best qualified to manage. If the divested unit is cash poor, the parent firm will be able to improve the efficiency of the internal capital market because the remaining segments of the firm will no longer have to cross-subsidize this segment. If the divested unit is cash rich or has many growth opportunities, the parent firm will have a smaller internal capital

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<sup>4</sup> PR Newswire, December 9, 1995.

market, but it will be more efficient because there are fewer units needing internal funds. Tracking stock, carve-outs, and spin-offs help to align managerial incentives with those of the shareholders by providing firms the option of tying management compensation to areas within the direct control of management. Carve-outs, spin-offs, exchanges, and sell-offs also provide the parent firm the opportunity to divest non-core or inefficient assets, which will also lead to a reduction in inefficiencies. Finally, each method provides the market more information regarding the parent firm and the divested unit, which reduces information asymmetry in the market.

The remainder of the paper proceeds as follows. Section 2 provides a discussion of restructuring alternatives. Section 3 presents testable hypotheses and empirical models. A discussion of the data used is presented in section 4. The results of the study are presented in section 5 and conclusions are presented in section 6.

## **2 Restructuring Alternatives**

The literature on divestitures has focused on the announcement effects and the long-term performance of both the parent firm and the divested unit. Several recent papers have examined the causes of restructuring and the choice of divestiture method. In all cases, the market reacts positively to the announcement of a divestiture but the level of reaction differs across methods, with spin-off announcements realizing the largest gains.<sup>5</sup> In addition to different market reactions, the methods also have different characteristics which are summarized in Figure 2.

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<sup>5</sup> See Schipper and Smith (1986), Vijn (1999), and D'Souza and Jacob (2000).

Carve-outs and spin-offs are the only methods that create a separate entity. They differ primarily in that the former is an initial public offering, whereas the latter is a pro rata distribution of shares to existing shareholders. Furthermore, parent firms generally retain a majority interest in the carved-out unit and the parent firm participates on the board of the new entity, while in the case of spin-offs the divested unit becomes an independent firm. Similar to a spin-off, tracking stock is designed to represent an interest in the earnings of one division of a firm. In contrast, the “tracked” division remains a part of the parent firm. Tracking stock can be issued through an initial public offering or through a pro rata distribution of shares to existing shareholders.

Spin-offs are generally non-taxable events for the parent firms whereas carve-outs and sell-offs generally result in tax costs for the parent firm.<sup>6</sup> In some cases, the parent firm will first carve-out 20 percent or less of the subsidiary and then follow this divestiture with a tax-free spin-off a short while later.<sup>7</sup> In the case of carve-outs, if the subsidiary sells shares in an IPO and remits the proceeds to the parent firm, the proceeds will be taxable if the amount is greater than the parent's tax basis in the subsidiary. In addition, if more than 20 percent is carved-out the subsidiary can no longer be consolidated on the parent's tax return.

When tracking stock is issued the parent firm does not relinquish control of the underlying assets, in contrast to spin-offs, exchanges, and sell-offs. In the case of a carve-out, some control is lost. In many cases, however, the parent firm participates on

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<sup>6</sup> Spin-offs are only considered non-taxable if they meet the requirements of IRS code 355. Conditions include the parent firm having control prior to distribution, the subsidiary engaging in "active conduct of business" after the spin-off, and the spin-off being motivated by a valid business purpose.

<sup>7</sup> This was the case when 3Com first carved-out 5 percent of Palm in March 2000 and followed the carve-out with a tax-free spin-off in July 2000.

the board of the new firm.<sup>8</sup> In addition, a “tracked” division can still contribute to the firm's internal capital market unlike the other restructurings.

### **3 Testable Hypothesis and Model Specification**

I examine the choice of restructuring method using a two-stage procedure. The first stage is to estimate the joint probabilities of restructuring and raising capital, restructuring only, and raising capital only. In the second stage, I estimate six separate logit equations conditional on the estimated values from the first stage to determine the choice of restructuring method. All variables are defined in detail in Appendix A.

#### **3.1 Likelihood of Restructuring and the Likelihood of Raising External Capital**

##### **Testable Hypotheses**

Consider the likelihood that a firm wants to restructure. Berger and Ofek (1999) find that the increase in restructuring activity in the 1980's and 1990's is consistent with at least three explanations for the value reduction of diversification found in previous studies. First, a decrease in the value of the benefits of the internal capital market may be a factor motivating the increased levels of restructuring. Second, changes in regulatory and competitive environments made focus more valuable in the 1980's. Third, restructuring programs may be a result of agency conflicts between owners and managers. They find that restructuring firms are more likely to experience external

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<sup>8</sup> See Boone (2001).

pressure, such as a hostile takeover attempt, and are ex ante viewed more negatively by the market. Additionally, they find that firms are more likely to restructure when they have a higher percentage of unrelated business or operating segments.

The impact of unrelated segments on the likelihood of restructuring is unclear. A firm with a very low percentage of unrelated segments may choose to divest the unrelated segments and focus on core competencies. In contrast, a firm may have a desire to maintain a degree of diversification for internal capital market purposes, and will instead elect to divest an underperforming segment to increase value.

The likelihood that a firm will restructure may also be related to the likelihood that a firm needs to raise external capital. A firm may need to raise capital, and due to a low market valuation of the firm's common stock or the amount of debt previously issued, an additional issue of common stock or debt may not be a viable option. In this case, the parent firm may elect to find a buyer for one of its segments, or choose to sell shares in a subsidiary via a carve-out or the issuance of tracking stock. Lang, Poulsen, and Stulz (1995) find that asset sales are used when they provide a cheaper source of funds than the external capital market.

Consider the joint probability of restructuring and raising external capital. The firm has four choices, it can: (1) do nothing, (2) restructure and raise external capital, (3) restructure only, or (4) raise external capital only.

Firms that are having financial difficulty are more likely to restructure than firms that are not having financial problems. In addition, firms in financial distress are less

likely to issue external capital due to the higher costs of issues. Hence, I test the following hypothesis:

- Hypothesis 1: The probability of restructuring and raising capital and the probability of restructuring will be negatively related to the firm's Altman's Z-score, a measure of financial distress.

In contrast, firms that are financially successful, measured by growth rates and return on assets, are able to access the external market more easily. These firms may elect to continue on their current successful path, or they may choose to restructure to take advantage of success in a particular market. Consistent with this notion, I test the following hypothesis:

- Hypothesis 2: The firm's growth rate and return on assets will be positively related to the likelihood the firm only issues external capital.

Whether or not a firm needs to issue external capital can be the result of many factors. A firm with many growth opportunities is more likely to need external financing than one with few opportunities for growth. Mitchell and Mulherin (1996) study industry-level patterns in takeover and restructuring activity and find that the interindustry patterns in the rate of restructurings is directly related to industry shocks. Hence, I expect that firms that are in industries with larger industry shocks are more likely to restructure than those in industries with smaller shocks. I expect that firms that are reluctant to lose control will be those that are less likely to restructure.

Expanding on the work of Berger and Ofek (1999), I test the following hypotheses.

- Hypothesis 3: The need to restructure is related to the likelihood that the firm will raise external capital and the likelihood of raising external capital is related to the likelihood a firm will restructure.
- Hypothesis 4: The likelihood a firm will restructure is positively related to abnormal industry sales, a proxy for industry shocks.

### Empirical Model

Using a multinomial logistic system, I estimate the probabilities that a firm (1) does nothing, (2) restructures and raises external capital, (3) restructures only, and (4) raises external capital only. The logistic model used for estimating the joint probabilities is similar to the model used by Boehm (1981). The model formulation is:

$$\begin{aligned}
 P(R = 0, C = 0) &= \frac{1}{G} \\
 P(R = 1, C = 1) &= \frac{e^{b_1 X}}{G} \\
 P(R = 1, C = 0) &= \frac{e^{b_2 X}}{G} \\
 P(R = 0, C = 1) &= \frac{e^{b_3 X}}{G}
 \end{aligned} \tag{1}$$

where

$$G = 1 + \sum_{i=1}^3 e^{b_i X} \tag{2}$$

R refers to restructuring and C refers to raising external capital. X is a vector of independent variables. The independent variables are measured using financial data from

the year prior to the restructuring and/or raising external capital announcement. The variables of interest in equation (1) are 1) firm  $i$ 's return on assets; 2) the percent of unrelated segments; 3) a measure of the firm's growth rate; 4) the firm's Altman's Z-score as a measure of financial distress (see Appendix C for calculation); 5) abnormal industry sales which proxies for any industry shocks; 6) the number of segments reported by the parent firm; 7) a measure of the firm's cash deficit relative to assets; 8) leverage; 9) current ratio; 10) an indicator variable equal to 1 if the firm pays a dividend or repurchases shares; 11) Tobin's  $q$  as a measure of the firm's growth opportunities; and 12) cash flow relative to assets. I use the natural log of firm  $i$ 's assets to control for firm size.

From equation (1), the following conditional probabilities can be derived:

$$P(R = 1 | C) = \frac{e^{b_2 X + a_{oi} C_{ii}}}{1 + e^{b_2 X + a_{oi} C_{ii}}} \quad (3)$$

$$P(C = 1 | R) = \frac{e^{b_3 X + a_{oi} C_{ii}}}{1 + e^{b_3 X + a_{oi} C_{ii}}}$$

where

$$a_{oi} = (b_1 - b_2 - b_3) X \quad (4)$$

From (3), it is possible to determine if the decision to issue external capital significantly affects the probability of restructuring and vice versa.

### 3.2 Restructuring Choice

#### Testable Hypotheses

Previous studies have not considered all restructuring options available. Billet and Mauer (2000) show that the announcement effect of an issue of tracking stock conveys information about the market's assessment of the value of a firm's internal capital market. This finding implies that parent firms with "cash cow" segments will be more likely to restructure through the issuance of tracking stock than those that with segments that are cash poor. In other words, if segment earnings are used to cross-subsidize other segments, tracking stock will be issued instead of an alternative divestiture method.

Powers (2001) analyzes a sample of spin-offs, sell-offs, and carve-outs to quantify the determinants of the chosen divestiture method. He shows that the parent's need for external capital and the quality of the division being divested are primary factors in determining the choice of divestiture method. He finds some evidence that the parent's level of focus and the extent to which manager incentives and shareholder interests are aligned also influence the decision. In addition, he finds that carve-out divisions are the most profitable and that spin-off and sell-off industries tend to under perform the market in the year prior to divestiture announcement. A limitation of his model is that the analysis is performed on a sample of firms that have already made the decision to divest.

From Figure 1, depending upon which path the firm chooses, there are 2 possible opportunity sets for the divestiture choice. For example, if the firm needs capital and wants to restructure, it can choose between the issuance of tracking stock, an exchange, a sell-off, or a carve-out (opportunity set 1). In the case of an exchange or a sell-off, the parent firm gives up control for the divested unit, while with a carve-out and the issuance of tracking stock, the parent firm maintains some or complete control. In addition,

capital is always raised with a carve-out or sell-off, and may or may not be raised with the issuance of tracking stock or in the case of an exchange. The firm's desire to restructure and the need for external capital is related to the joint probabilities of restructuring and raising capital and the probability of only restructuring. Specifically, a lower probability of restructuring would correspond to parent firms that do not want to relinquish control of the unit.

In the case of spin-offs, sell-offs, and exchanges, the parent firm gives up control of the divested segment. In many carve-out cases, the parent firm maintains a majority interest and participates on the board of the new entity. With tracking stock, the firm's level of control does not change. I expect that a desire to retain or relinquish control is related to the likelihood that the parent firm will restructure. Specifically, a lower probability of restructuring would correspond to parent firms that do not want to relinquish control of the unit.

Lang, Poulsen, and Stulz (1995) find that firms selling assets tend to be poor performers or have high leverage ratios. A sell-off or an exchange is more likely to be associated with smaller segments that can be quickly integrated into the operations of an acquiring firm. They are less likely to be segments that could be stand-alone firms, as is the case with segments that are divested via a spin-off or carve-out. With regard to raising capital, if the likelihood of raising capital is high, a spin-off, and in some cases the issuance of tracking stock or an exchange, is not likely to be the divestiture of choice because, in these cases, cash is not raised. A need for cash implies a lower current ratio, a

lower level of free cash flows, and a higher deficit in year t-1 relative to year t-2, where year t is the year of the divestiture.

Consistent with the above observations I test the following hypotheses for opportunity set 1 (tracking, exchange, sell-off, or carve-out):

- Hypothesis 5: An issuance of tracking stock will be more likely for related segments and for firms with lower probabilities of restructuring.
- Hypothesis 6: An exchange is more likely as the probability of restructuring and issuing capital decreases and for related segments.
- Hypothesis 7: A sell-off is more likely as the probability of restructuring and issuing capital increases and for underperforming segments.
- Hypothesis 8: A carve-out is more likely as the probability of restructuring and issuing capital increases and for segments that are larger and performing well.
- Hypothesis 9: The likelihood of a carve-out or sell-off will be negatively related to the change, from year t-2 to year t-1, in the parent firm's current ratio, the firm's free cash flows, and positively related to changes in the firm's deficit.

For opportunity set 2 (spin-off, tracking, exchange), I test the following hypotheses:

- Hypothesis 10: The likelihood of an exchange increases as the probability of restructuring decreases.
- Hypothesis 11: Spin-offs are more likely for unrelated segments and for firms with a higher likelihood of restructuring.

If the restructuring choice is designed to "unlock hidden value," I expect that the level of undervaluation will be increasing in the years prior to the restructuring and that the firm will be undervalued in year t-1. If the parent firm's Altman's Z-score is

decreasing, hence an increase in the likelihood of bankruptcy, the firm may be able to improve performance by selling-off under performing assets.<sup>9</sup>

- Hypothesis 12: If the restructuring method "unlocks" value, the likelihood of this choice will be positively related to increases in undervaluation and to the current level of undervaluation.

### Empirical Model

Following Powers (2001), I model the restructuring choice. This study differs from Powers (2001) because it incorporates the joint probabilities of restructuring and raising capital and of restructuring only. Using this approach, looks at the restructuring choice as a joint decision, rather than one in which the decision to restructure and raise capital are unrelated or made separately. Following Figure 1, for each opportunity set illustrated, I estimate the following equation for each restructured segment  $j$ :

$$s_j = \frac{e^{\beta X_i}}{1 + e^{\beta X_j}} \quad (5)$$

where  $s$  is set to 0 if alternative A is chosen and 1 otherwise. For example, consider opportunity set 1 in Figure 1. The firm has a choice of a carve-out, a sell-off, an exchange, or the issuance of a tracking stock. In this case, the model will compare the choice of carve-out ( $s=0$ ) to the choice of any of the other 3 alternatives ( $s=1$ ). The model will be estimated for each of the 4 choices versus the remaining 3 for this opportunity set.

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<sup>9</sup> See Altman, Haldeman, and Narayanan (1977) for a discussion of how well the Altman's Z-score predicts the occurrence of bankruptcy.

The independent variables of interest in equation (5) are the inverse mills ratios from the estimation of equations (1), and changes in the 1) parent firm's return on assets; 2) Altman's Z-score; 3) leverage ratio; 4) Tobin's q; 5) size; 6) growth; 7) cash flow relative to assets; 8) cash deficit relative to assets; 9) current ratio from the year t-2 to year t-1, where year t is the year of the divestiture; and 10) the year t abnormal industry sales for the parent industry; 11) the year t measure of undervaluation; 12) an indicator variable equal to 1 if the degree of undervaluation increases from year t-2 to year t-1; and the year t-1 measures of segment *j*'s 13) return on assets; 14) relative size; 15) growth in sales; and 16) an indicator variable equal to 1 if the segment is related to the parent firm. A segment is considered related to the parent firm if its SIC code places it in the same Fama and French (1997) industry as the parent firm.<sup>10</sup>

#### **4 Data**

The data used in this study are obtained from several sources. I used financial data and market values from the Compustat annual, primary, supplementary, and tertiary (pst), and research files. I used Compustat segment data for the `active' population to identify multi-segment firms.<sup>11</sup> The Financial Accounting Standards Board (FASB) requirements for reporting segment data changed in 1998 resulting in four segment types reported in the Compustat database. For purposes of this study, I consider only Business

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<sup>10</sup>The model is estimated using levels rather than changes as well. Results of this estimation are available upon request.

<sup>11</sup>The `active' population consists of firms that are actively trading.

and Operating segments.<sup>12</sup> I do not exclude firms with segments in financial industries because many large firms, such as General Electric and AT&T, have a financial segment and thus would be excluded from the analysis. The Securities Data Corporation (SDC) New Issues and Merger and Acquisition databases are used to identify firms that raised capital or divested segments via carve-out, sell-off, spin-off, or exchange or issued tracking stock during the period from 1990 to 1999. The primary focus of this study is on firms that restructure, so I match the sample from SDC to the sample of Compustat firms to form the primary sample. Financial information for divested segments is from the parent firm's 10-K for the year prior to the divestiture. If segment data are not reported in the 10-K for carve-outs, spin-offs, and tracking stocks I use the first 10-K for the divested segment or, in the case of tracking stock, the first 10-K after the restructuring.

I use the median single-segment firm in the same industry to calculate the Berger and Ofek (1995) imputed values for each segment of the multi-segment firms using both sales-based and asset-based measures. For the sample of multi-segment firms used in this study, 66.3 percent were matched using 4-digit SIC codes, 21.0 percent using 3-digit SIC codes, and 12.6 percent using 2-digit SIC codes. The total imputed value for each multi-segment firm is determined and used to calculate the diversification discount as defined by Berger and Ofek (1995). Appendix B describes the calculation in detail.

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<sup>12</sup> The four segment types are BUSSEG, OPSEG, GEOSEG, and STSEG. BUSSEG consists of segments reported by product line of the division. OPSEG generally combines either country, state, or region with business segments. GEOSEG presents the data by country and STSEG reports segment information by US geographic information.

For each firm in the sample, I calculate a modified version of the Shyam-Sunder and Myers (1999) cash deficit measure. This measure serves as a proxy for whether the firm needs cash. Their calculation is as follows:

$$DEF_t = DIV_t + X_t + \Delta W_t + R_t - C_t$$

where  $DIV$  represents dividend payments,  $X$  represents capital expenditures,  $\Delta W$  represents the net increase in working capital,  $R$  is the current portion of long-term debt, and  $C$  is operating cash flows after interest and taxes. I modify this by using the cash flows from year  $t-1$ . I use year  $t-1$  cash flows to determine if the firm will need cash in the future, assuming that all expenses are the same as in year  $t$ . This approach results in an under or over estimation if the firm is decreasing expenses or expenses are growing.

Following Mitchell and Mulherin (1996), abnormal industry sales are calculated as the absolute value of the difference between the industry's sales growth and the average sales growth of all industries. This is then used to proxy for economic shocks that Mitchell and Mulherin (1996) find to be related to the likelihood of a takeover or restructuring. For purposes of this study, I use the universe of Compustat firms classified into Fama and French (1997) industries to estimate the economic shock for each industry. Industry sales growth is defined as:<sup>13</sup>

$$Industry\ Sales\ Growth = \ln\left(\frac{Sales_t}{Sales_{t-4}}\right)$$

Table 1 summarizes restructurings, issuances, and the number of segments reported by year for the complete sample. From 1991 to 2000, the sample of firms

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<sup>13</sup> Consistent with Mitchell and Mulherin (1996) I use a 5 year time period to calculate abnormal industry sales.

conducted more than 4,400 restructurings and participated in more than 3,100 issuances of debt or equity. The number of restructurings increased each year from 1991 to 1998 with the greatest number, 575, occurring in 1998. The average number of restructurings per year was 448. The sample consists of 133 carve-outs, 208 spin-offs, 3,922 sell-offs, 199 exchanges, and 15 issues of tracking stock.<sup>14</sup> The untabulated average proceeds were smallest, \$215 million, for sell-offs and largest, \$4,239 million, for issues of tracking stock. More than half, 2,357, of the restructurings were done by single-segment firms.<sup>15</sup>

On average, there were 16 issues of debt per year with the largest number, 235, occurring in 1992. The average number of equity issues per year was 15 with the largest number, 211, occurring in 1993. During the 10 year period, there are 418 occurrences, by 306 firms, of a firm restructuring and issuing capital in the same year. While most firms only report one segment, the number of multi-segment firms tends to increase each year with the largest increase occurring in 1998 when the FASB rules for segment reporting changed.

Table 2 presents a univariate comparison of restructuring and issuing firms, restructuring only firms, issuing only firms, and firms that neither restructure nor issue capital in year  $t$ . Using a Scheffe test<sup>16</sup> for multiple comparisons, results of which are not reported in the table, I find free cash flows (CFRELA) for firms that do neither are significantly greater than the free cash flows for restructuring firms, issuing firms, and

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<sup>14</sup> 27 spin-offs were eliminated because a carve-out of the same segment occurred less than 1 year prior to the spin-off.

<sup>15</sup> For purposes of this study, I classify a firm as single-segment if it does not have segment data on the Compustat Industry Segment database. The firm may have more than one segment, but separate reports are not provided based on FASB standards.

<sup>16</sup> The results for the multiple comparisons are available upon request. A Bonferroni test was also used; however, the results were not significantly different from those for the Scheffe test.

restructuring and issuing firms (p-values = .000, .000, and .019 respectively). Industry shocks (INDSH) for firms that do nothing are significantly smaller than the shocks for all other firms (p-values  $\leq$  .003) while industry shocks for firms that restructure and issue capital are greater than the shock for firms that only restructure or only issue capital (p-values = .043, .003 respectively). This is consistent with Mitchell and Mulherin (1996) which finds that industry shocks are related to the likelihood of restructuring.

Firms that do nothing have fewer segments (NSEG) and a lower percentage of unrelated segments (PERUNREL) than firms that restructure (p-values = .000) and firms that restructure and issue capital have more segments and a higher percentage of unrelated segments than firms that only restructure or only issue capital (p-values = .000). In addition, firms that only restructure have more segments and a higher percentage of unrelated segments than firms that only issue capital. The return on assets (ROA) for firms that do nothing is lower than that for all other firms (p-values = .000), consistent with the idea that firms that are growing are more likely to need capital or are more likely to restructure to take advantage of a successful market sector. In addition, firms that only issue capital have higher growth rates (GROWTH) than all other firms (p-values  $\leq$  .001) and firms that restructure only have lower growth rates than firms that do nothing (p-value = .046).

Firms that only restructure have lower Tobin's q (TOBIN) values than firms that only issue capital (p-value  $\leq$  .012), consistent with the notion that firms that have growth opportunities can go to the external capital market more easily than those without. Firms that do nothing are less likely to pay a dividend or repurchase shares (DIV) and firms that

restructure and issue capital are more likely to pay a dividend than firms that do one or the other. Finally, firms that do nothing are smaller (SIZE) than all other firms (p-values = .000) and firms that restructure and issue capital are larger than firms that only restructure or only issue capital (p-values = .000). In addition, firms that only restructure are larger than firms that only issue capital (p-value = .068).

Overall, the univariate analysis supports the notion that firms choosing to restructure and issue external capital are notably different than those choose to only restructure, only issue external capital, or those that do nothing. It also shows that there are some similarities between restructuring firms and issuing firms, supporting the need for a joint analysis of the restructuring and issuing decisions.

Table 3 presents a univariate comparison by restructuring method. Using a Scheffe test<sup>17</sup> for multiple comparisons, results of which are not reported in the table, I find that the percent of unrelated segments (PERUNREL) for spin-off firms is significantly different from the percent of unrelated segments for sell-off firms (p-value = .09). Parent firm growth (GROWTH) for exchange firms is significantly different than the growth for spin-off and sell-off firms (p-values = .072 and .002 respectively). Parent size (SIZE) for tracking stocks and carve-outs is significantly different from the parent size for sell-offs and spin-offs (p-values = .000;p-values lt .060). In addition, firm size for carve-out firm's is significantly different than that for tracking stock firms (p-value = .000). Firm size for tracking stock firms is also significantly different than that for

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<sup>17</sup> The results of the multiple comparisons are not reported. A Bonferroni test was also used, however the results were not significantly different than those for the Scheffe test.

exchange firms (p-value = .000). The number of segments (NSEG) for parent firms restructuring via tracking stock is significantly different from that for all other methods (p-values  $\leq$  .051) and the number of segments reported by sell-off firms is significantly different than that for carve-out and spin-off firms (p-values  $\leq$  .086).

Table 4 Panel A (sales-based) and Panel B (asset-based) report univariate statistics by method for the variables of interest in the model of divestiture choice. Changes are reported for year t-2 to year t-1, where year t is the year of the restructuring. The sample has been restricted to multi-segment firms and sell-offs and exchanges with proceeds less than \$35 million have been eliminated.<sup>18</sup> In the years preceding the restructuring, the firm's growth rate (CGROWTH) is decreasing for all methods except spin-offs. On average, the firm is undervalued using a sales-based measure (UNDERVALS) for all methods, and undervalued for exchanges using an asset-based measure (UNDERVALA). Using a Scheffe test for multiple comparisons, I find that the change in the firm's Altman's Z-score (CALTMANZ) for carve-out firms is significantly different than the change for sell-off firms (p-value = .0750). The change in growth (CGROWTH) for carve-outs is significantly different than the change for both spin-offs and sell-offs (p-value = .060; p-value = .030). In addition, I find that the change in firm size (CSIZE) for tracking stock firms is significantly different from the change in size for all other methods (p-values = 0.001).

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<sup>18</sup> I restrict the sell-offs because some assets are too small to be considered a viable candidate for a carve-out, spin-off, or tracking stock issue. The \$35 million threshold is based on a univariate analysis of proceeds by method. Single segment firms are eliminated because, at this time, there is not a measure of diversification discount for single segment firms.

## 5 Results

The regression results for the simultaneous estimation of the likelihood a firm will restructure and the likelihood it will raise external capital are shown in Table 5.<sup>19</sup> Consistent with Hypothesis 1, the likelihood the firm will restructure and raise capital is negatively related to the firm's Altman's Z-score (ALTMANZ), but the relationship is insignificant. Contrary to Hypothesis 4, industry shock (INDSH) is negatively and significantly related to the likelihood the firm restructures and issues capital. A firm is more likely to restructure and raise capital as the percentage of unrelated segments (PERUNREL) increases, leverage (LEV) increases, and current ratio (CRAT) decreases. Specifically, a one standard deviation increase in PERUNREL, increases the likelihood the firm will restructure and raise capital by 0.05%.<sup>20</sup> A one standard deviation change in the industry shock of the parent firm decreases the likelihood by 0.05%. A one standard deviation change in leverage increases the likelihood of restructuring and raising capital by 0.05% while a one standard deviation change in current ratio decreases the likelihood 0.11%.

Contrary to Hypothesis 4, the likelihood a firm will only restructure is negatively and significantly related to industry shocks (INDSH). The likelihood the firm only restructures is negatively and significantly related to firm growth (GROWTH), return on assets (ROA), and current ratio (CRAT). It is positively and significantly related to the number of segments (NSEG), the percentage of unrelated segments (PERUNREL), firm

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<sup>19</sup> Results are reported relative to the base case which is firms that do nothing.

<sup>20</sup> The effect of a one standard deviation change is determined by multiplying the marginal effect (0.0019) by the standard deviation (0.28834).

size (SIZE), and free cash flows (CFRELA). In addition, firms that pay dividends are less likely to only restructure. Specifically a one standard deviation change in free cash flows decreases the likelihood of restructuring by 6.6% and a one standard deviation change in return on assets decreases the likelihood by more than 3%.

Finally, the likelihood of only issuing capital is positively and significantly related to firm growth, consistent with hypothesis 4. As the percentage of unrelated segments (PERUNREL) decreases the likelihood of issuing capital decreases (0.41% per one standard deviation decrease). As the firm becomes more financially sound, as measured by an increase in the Altman's Z-score, the likelihood of only issuing capital increases. Finally firms with more growth opportunities (TOBIN) and larger firms are more likely to only issue capital – consistent with the notion that larger firms have more access to external capital markets.

To test hypothesis 3, I calculate the coefficient,  $a_{0i}$ , for restructuring and for issuing capital using equation 4. Based on the 1<sup>st</sup> stage estimation,  $a_{0i}$  is -0.5043 and it is significantly different from zero (p-value < .0001). Hence, consistent with hypothesis 3, the likelihood of restructuring is related to the whether or not the firm issues capital and vice versa. Specifically, from equation 3, a firm is less likely to restructure if it issues capital and it is less likely to issue capital if it has restructured.

Using the predicted probabilities from stage 1, I calculate inverse mills ratios to account for the selection bias induced by reducing the sample size for stage 2. The equation for the inverse mills ratio from the 1<sup>st</sup> stage multinomial estimation is:

$$INV = \frac{f(H_j)}{\Phi(H_j)} \quad (6)$$

where

$$H_j = \Phi^{-1}(P(R = 1, C = 1)) \text{ or} \quad (7)$$

$$H_j = \Phi^{-1}(P(R = 1, C = 0))$$

The results for the logit estimations of divestiture choice are reported in table 6 (asset-based) and 7 (sales-based). I restrict the sample to multi-segment firms and eliminate sell-offs and exchanges with proceeds less than \$35 million. First consider opportunity set 1 where the firm chooses between an exchange, a sell-off, a carve-out, or the issuance of tracking stock. Consistent with hypothesis 6, I find that exchanges are more likely as the probability of restructuring and raising capital decreases; however, I do not find that exchanges are more likely for related segments. The likelihood of a sell-off increases as the probability the firm only restructures decreases. I find that the likelihood of a carve-out increases as the likelihood the firm only restructures decreases. Firms are more likely to carve-out segments that are growing, consistent with the notion that firms would only carve-out segments that can succeed as stand alone firms.

When firms have the choice between spin-offs, exchanges, and tracking stock, I find, consistent with hypothesis 11, that spin-offs are more likely for unrelated segments and for firms with a higher probability of only restructuring. As the probability of restructuring and raising capital decreases, exchanges are more likely than spin-offs or tracking stock issues.

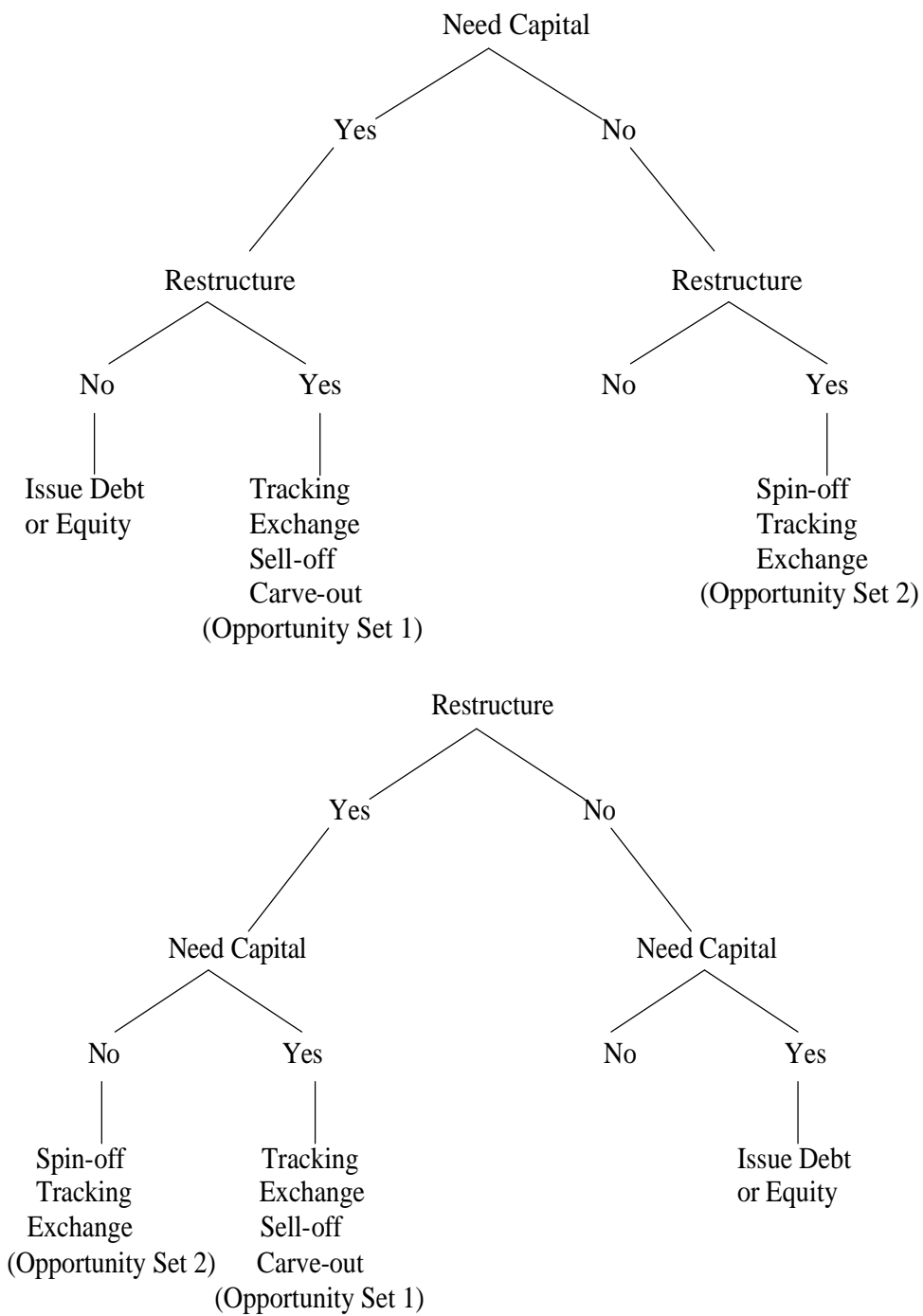
I find that carve-outs are more likely for firms that have a decreasing diversification discount and sell-offs are more likely for firms with an increasing diversification discount. This is consistent with firms being unwilling to go the market until fair value can be realized and the firm is more likely to get fair value when selling an asset to one investor than selling shares to many investors.

## **6 Conclusions**

This study shows that the decision to restructure and the decision to raise external capital should be treated as a joint decision. In addition, the joint probability of restructuring and raising capital and the probability the firm only restructures influences the firm's divestiture choice.

Future research will expand this study by including a measure for 'hot' IPO markets in both the 1<sup>st</sup> and 2<sup>nd</sup> stage estimations. The development of a diversification discount for single segment firms will also enhance the results of the study. Finally, I will evaluate the evolution of the firm's diversification discount to determine how it changes in the years prior to restructuring.

**Figure 1**  
**Decision Process Alternatives**



**Figure 2**  
**A Comparison of Characteristics**

<u>Characteristic</u>	<u>Carve-Out</u>	<u>Spin-off</u>	<u>Sell-off</u>	<u>Tracking</u>	<u>Exchange</u>
Capital Raised	Y	N	Y	P	P
Separate Entity	Y	Y	N	N	N
Tax Impact	Y	P	Y	N	P
Maintain Internal Capital Market	N	N	N	Y	N
Loss of Control	P	Y	Y	N	Y

‘Y’ represents a characteristic of the method while a ‘P’ indicates that the characteristic applies in some, but not all cases. ‘N’ represents that the characteristic does not apply to the method.

**Table 1**  
**Descriptive Statistics**

Summary information for sample firms that restructured or issued capital during the period from 1991 to 2000. Panel A reports the restructurings and issuances by year. Panel B reports the number of reported business and operating segments by year. A carve-out is defined as a public offering of shares in a wholly owned subsidiary of the parent firm. A spin-off is a pro-rata distribution of the shares of a subsidiary of the parent firm. A sell-off occurs when the parent firm sells a unit, operation, product line, business, or group. An exchange occurs when the parent firm relinquishes control of a product line, business, or operation in exchange for shares or assets of the acquiring firm. The issuance of tracking stock represents a public offering or pro-rata distribution of shares in a division of the firm without loss of control by the parent firm.

Panel A: Restructurings and Issuances by Year

Year	Carve-out	Spin-off	Sell-off	Exchange	Tracking	Total		
						Restructurings	Debt	Equity
1991	16	9	250	12	1	288	185	189
1992	13	12	259	21	1	306	235	151
1993	15	11	277	12	1	316	231	211
1994	15	13	267	16	1	312	122	110
1995	14	27	397	27	1	466	141	151
1996	22	29	478	27	0	556	179	196
1997	1	25	499	32	2	559	201	193
1998	11	23	526	13	2	575	186	101
1999	17	23	510	18	2	570	122	133
2000	9	36	459	21	4	529	47	100
Total	133	208	3,922	199	15	4,477	1,649	1,535

**Table 1 (contd.)**Panel B: Number of Reported Segments by Year

Year	1 Segment	2 Segments	3 Segments	4 Segments	5 or More Segments	Total
1990	1,998	227	186	91	56	2,558
1991	2,048	246	184	92	52	2,622
1992	2,007	259	189	83	56	2,594
1993	2,033	270	189	93	58	2,643
1994	2,153	282	202	98	54	2,789
1995	2,330	312	214	99	60	3,015
1996	2,523	342	236	98	59	3,258
1997	2,580	354	221	107	66	3,328
1998	2,076	562	398	187	154	3,377
1999	1,758	605	470	224	197	3,254
Total	21,506	3,459	2,489	1,172	812	29,438

**Table 2**  
**Univariate Comparison - Parent Firm Characteristics**

Univariate comparison of restructuring and issuing firms, restructuring only firms, issuing only firms, and firms that neither restructure nor issue capital in year  $t$ . A firm is classified as restructuring if it conducted a carve-out, spin-off, sell-off, or exchange or issued tracking stock in year  $t$ . The mean (median) are provided for each variable. All variables are measured in year  $t-1$ . DEFRELA is a modified version of Shyam-Sunder and Myers (1999) deficit measure scaled by assets. CFRELA is a measure of the firm's free cash flows scaled by assets. INDSH is a measure of industry shocks and is computed, consistent with Mitchell and Mulherin (1996), as the absolute value of  $(\ln((\text{Sales year } t)/(\text{Sales year } t-4))) - \text{average shock for all industries}$ , where sales are in real terms using the GNP deflator. PERUNREL is the percentage of unrelated segments reported by the parent firm, where a segment is classified as unrelated if it is not in the same Fama and French (1997) industry as the parent firm. ROA is the parent firm's return on assets. ALTMANZ is the parent firm's Altman-Z score, a measure of financial distress. GROWTH is the firm's capital expenditures divided by the firm's total assets. TOBIN is the parent firm's Tobin's  $q$ . LEV is the parent firm's leverage ratio. DIV is an indicator variable taking a value of 1 if the firm pays a dividend. SIZE is the value of the assets of the firm and CRAT is the firm's current ratio. NSEG is the number of segments reported by the firm.

	Restructuring Firms	Restructuring and Issuing Firms	Issuing Firms	Firms neither Restructuring or Issuing Capital
DEFRELA	0.0530 (0.0249)	0.0267 (0.0202)	0.0889 (0.0500)	0.0919 (0.0439)
CFRELA	0.0387 (0.0674)	0.0659 (0.0688)	0.0574 (0.0695)	0.0019 (0.0635)
INDSH	1.0982 (0.6920)	0.8796 (0.6622)	1.1709 (0.7511)	1.2970 (0.7823)
PERUNREL	0.2174 (0.0000)	0.2957 (0.0000)	0.1290 (0.0000)	0.1167 (0.0000)
ROA	0.0866 (0.1183)	0.1341 (0.1381)	0.1161 (0.1302)	0.0507 (0.1137)
ALTMANZ	50.2270 (3.7337)	9.385 (3.5526)	140.10 (3.9959)	102.788 (4.2920)
GROWTH	0.0639 (0.0507)	0.0690 (0.0620)	0.0847 (0.0642)	0.0678 (0.0489)
TOBIN	1.7660 (1.3562)	1.7278 (1.5015)	2.0785 (1.4747)	1.9981 (1.3313)

**Table 2 (contd.)**

	Restructuring Firms	Restructuring and Issuing Firms	Issuing Firms	Firms neither Restructuring or Issuing Capital
LEV	0.2773 (0.2459)	0.2852 (0.2679)	0.2807 (0.2745)	0.2615 (0.2080)
DIV	0.6347 (1.0000)	0.8206 (1.0000)	0.6217 (1.0000)	0.4959 (0.0000)
SIZE	3659.28 (562.15)	9346.78 (4870.20)	3158.12 (740.26)	1247.97 (107.99)
CRAT	1.8153 (1.5598)	1.4513 (1.2757)	1.9922 (1.5064)	2.2671 (1.7942)
NSEG	1.9784 (1.0000)	2.3852 (2.0000)	1.6322 (1.0000)	1.4543 (1.7942)
OBS	2967	418	2096	23957

**Table 3**  
**Univariate Comparison – Parent Characteristics by Type of Restructuring**

Univariate comparison by type of restructuring. Mean (median) values are reported for each variable and are measured in the year prior to restructuring. Comparisons are provided for the parent firm's deficit relative to assets (DEFRELA), free cash flow relative to assets (CFRELA), a measure of the industry shock in the parent firm's industry (INDSH), return on assets (ROA), Altman-Z score, leverage ratio (LEV), Tobin's q, current ratio (CRAT), total assets, and number of segments (NSEG).

	Carve-out	Spin-off	Sell-off	Tracking	Exchange
DEFRELA	0.0451 (0.0330)	0.0466 (0.0249)	0.0485 (0.0227)	0.0326 (0.0325)	0.0407 (0.0274)
CFRELA	0.0387 (0.0617)	0.0664 (0.0728)	0.0433 (0.0680)	0.1010 (0.0823)	0.0185 (0.0569)
INDSH	1.2362 (0.7496)	1.1232 (0.6967)	1.0576 (0.6769)	0.9032 (0.5732)	1.2579 (0.8289)
PERUNREL	0.2953 (0.0000)	0.2972 (0.0000)	0.2224 (0.0000)	0.3744 (0.3333)	0.2785 (0.0000)
ROA	0.0926 (0.1112)	0.1186 (0.1270)	0.0938 (0.1214)	0.1263 (0.1343)	0.0696 (0.1155)
ALTMANZ	10.8923 (3.5298)	11.8701 (4.1339)	46.0573 (3.6858)	8.3237 (3.9500)	58.4387 (4.2246)
GROWTH	0.0614 (0.0590)	0.0651 (0.0562)	0.0655 (0.0517)	0.0861 (0.0844)	0.0453 (0.0486)
TOBIN	2.0986 (1.4665)	1.9010 (1.4563)	1.7410 (1.3672)	1.6487 (1.4252)	1.9494 (1.5725)
LEV	0.2957 (0.2579)	0.2643 (0.2447)	0.2792 (0.2482)	0.2525 (0.2425)	0.2490 (0.2252)
DIV	0.6265 (1.0000)	0.6974 (1.0000)	0.6625 (1.0000)	0.7692 (1.0000)	0.6335 (1.0000)
SIZE	8593.21 (2451.70)	4589.98 (1624.85)	4456.30 (775.53)	29776.72 (12818.00)	5555.02 (965.66)

**Table 3 (contd.)**

	Carve-out	Spin-off	Sell-off	Tracking	Exchange
CRAT	1.7046 (1.5564)	1.9481 (1.5691)	1.7463 (1.5144)	1.1208 (1.0193)	1.8546 (1.5368)
NSEG	2.4428 (1.0000)	2.3333 (2.0000)	2.0205 (1.0000)	3.7692 (3.0000)	2.0995 (1.0000)
OBS	131	195	3,025	13	191

**Table 4**  
**Univariate Statistics – Changes in Parent Characteristics and**  
**Segment Data by Type**

Univariate comparison by type of restructuring for sample of divestitures from 1991 to 1999. The sample is reduced to include only multi-segment firms and sell-offs and exchanges are restricted to \$35 million. Means (medians) are reported for changes from year t-2 to year t-1, where year t is the year of restructuring, in the parent firm's free cash flow relative to assets (CCFRELA), industry shock (CINDSH), return on assets (CROA), Altman-Z score (CALTMANZ), growth (CGROWTH), Tobin's q (CTOBIN), leverage (CLEV), size (CSIZE), cash deficit relative to assets (CDEFRELA), and current ratio (CCRAT). The mean (median) value of the parent firm's diversification discount is also provided. INCREASE is an indicator variable that takes a value of 1 if the firm's diversification discount increases from year t-2 to year t-1. Mean (median) values are reported for the divested segment's size relative to the parent firm (RELSIZE), return on assets (SROA), growth in sales from year t-2 to year t-1 (GSALES), and the indicator variable for relatedness which takes on a value of 1 if the segment and parent firm are classified in the same Fama and French (1997) industry (RELATED). Panel A reports values for firms with a sales-based diversification discount and Panel B reports values for firms with an asset-based diversification discount.

Panel A: Sales-based diversification discount					
	Carve- out	Spin-off	Sell-off	Tracking	Exchange
INCREASE	0.3514 (0.0000)	0.4714 (0.0000)	0.4826 (0.0000)	0.4286 (0.0000)	0.5357 (1.0000)
UNDERVALS	0.0911 (-0.0191)	0.1738 (0.1446)	0.1800 (0.1240)	0.2843 (0.3212)	0.2584 (0.1704)
CROA	0.0001 (0.0014)	-0.0009 (0.0004)	-0.0032 (-0.0005)	-0.0316 (-0.0107)	-0.0172 (0.0054)
CALTMANZ	72.2772 (-0.3200)	0.0420 (-0.2109)	5.0573 (0.0399)	-0.7995 (-0.1922)	0.3843 (0.2885)
CGROWTH	-0.0264 (-0.0047)	0.0005 (-0.0009)	-0.0020 (-0.0010)	-0.0117 (-0.0013)	-0.0208 (-0.0024)
CTOBIN	-0.0094 (-0.0887)	-0.0563 (-0.0752)	0.0067 (0.0193)	-0.2002 (-0.1282)	0.0613 (0.0508)
CLEV	-0.0059 (-0.0111)	-0.0040 (-0.0040)	0.0118 (-0.0017)	-0.0067 (-0.0173)	-0.0066 (-0.0078)

**Table 4 (contd.)**

Panel A (contd.)					
	Carve-out	Spin-off	Sell-off	Tracking	Exchange
CSIZE	567.18 (42.93)	3312.40 (124.59)	526.84 (71.97)	15035.76 (483.00)	1337.93 (45.18)
CCRAT	0.0276 (0.0013)	0.0281 (-0.0196)	-0.0071 (-0.0304)	-0.1006 (-0.0407)	-0.1594 (-0.1047)
CCFRELA	-0.0050 (-0.0006)	-0.0089 (-0.0020)	0.0051 (0.0027)	0.0032 (0.0031)	-0.0185 (0.0036)
CINDSH	0.0370 (0.0399)	-0.1125 (-0.0775)	0.0128 (0.0706)	-0.1465 (-0.4047)	0.0327 (0.0001)
CDEFRELA	-0.025 (-0.0135)	-0.0075 (0.0015)	-0.0040 (-0.0033)	-0.0249 (-0.0271)	-0.0483 (-0.0386)
RELSIZE	0.2483 (0.1976)	0.2799 (0.2516)	0.3789 (0.2490)	0.2765 (0.2581)	0.2564 (0.2081)
GSALES	0.4112 (0.1408)	0.0979 (0.0505)	0.1316 (0.0469)	0.3056 (0.0367)	0.0425 (0.0293)
SROA	0.1355 (0.0981)	0.1089 (0.1144)	0.0641 (0.1045)	0.1846 (0.0807)	-0.0872 (0.0769)
RELATED	0.2703 (0.0000)	0.1571 (0.0000)	0.2935 (0.0000)	0.5714 (1.0000)	0.2857 (0.0000)
OBS	37	70	719	7	28

**Table 4 (contd.)**

Panel B: Asset-based diversification discount					
	Carve-out	Spin-off	Sell-off	Tracking	Exchange
INCREASE	0.3243 (0.0000)	0.4783 (0.0000)	0.4902 (0.0000)	0.5714 (1.0000)	0.4286 (0.0000)
UNDERVALA	-0.1692 (-0.0146)	-0.0777 (0.0176)	-0.0611 (-0.0354)	-0.0002 (0.2034)	0.0167 (-0.0035)
CROA	0.0001 (0.0014)	-0.0017 (-0.0007)	-0.0032 (-0.0005)	-0.0316 (-0.0107)	-0.0172 (0.0054)
CALTMANZ	72.2772 (-0.3200)	0.0536 (-0.2091)	5.0686 (0.0388)	-0.7995 (-0.1922)	0.3843 (0.2885)
CGROWTH	-0.0264 (-0.0047)	0.0007 (-0.0007)	-0.0020 (-0.0010)	-0.0117 (-0.0013)	-0.0208 (-0.0024)
CTOBIN	-0.0094 (-0.0887)	-0.0542 (-0.0662)	0.0066 (0.0185)	-0.2002 (-0.1282)	0.0613 (0.0508)
CLEV	-0.0059 (-0.0111)	-0.0041 (-0.0052)	0.0118 (-0.0017)	-0.0067 (-0.0173)	-0.0066 (-0.0078)
CSIZE	567.18 (42.93)	3362.96 (128.06)	524.55 (71.97)	15035.76 (483.00)	1337.93 (45.18)
CCRAT	0.0276 (0.0013)	0.0284 (-0.0221)	-0.0066 (-0.0269)	-0.1006 (-0.0407)	-0.1594 (-0.1047)
CCFRELA	-0.0050 (-0.0006)	-0.0054 (-0.0017)	0.0056 (0.0031)	0.0032 (0.0031)	-0.0185 (0.0036)
CINDSH	0.0370 (0.0399)	-0.1054 (0.0795)	0.0121 (0.0703)	-0.1465 (-0.4047)	0.0327 (0.0001)
CDEFRELA	-0.0245 (-0.0135)	-0.0057 (0.0037)	-0.0042 (-0.0034)	-0.0249 (-0.0271)	-0.0483 (-0.0386)
RELSIZE	0.2483 (0.1976)	0.2836 (0.2544)	0.3795 (0.2492)	0.2765 (0.2581)	0.2564 (0.2081)

**Table 4 (contd.)**

Panel B: (contd.)					
	Carve-out	Spin-off	Sell-off	Tracking	Exchange
GSALES	0.4112 (0.1408)	0.0984 (0.0500)	0.1318 (0.0469)	0.3056 (0.0367)	0.0425 (0.0293)
SROA	0.1355 (0.0981)	0.1016 (0.1130)	0.0647 (0.1045)	0.1846 (0.0807)	-0.0872 (0.0769)
RELATED	0.2703 (0.0000)	0.1449 (0.0000)	0.2947 (0.0000)	0.5714 (1.0000)	0.2857 (0.0000)
OBS	37	69	716	7	28

**Table 5**  
**Stage 1 Estimation - Joint**

This table presents the marginal effects resulting from the estimation of the following model:

$$P(R = 0, C = 0) = \frac{1}{G} \quad P(R = 1, C = 1) = \frac{e^{b_1 X}}{G} \quad P(R = 1, C = 0) = \frac{e^{b_2 X}}{G}$$

$$P(R = 0, C = 1) = \frac{e^{b_3 X}}{G} \quad \text{where} \quad G = 1 + \sum_{i=1}^3 e^{b_i X}$$

R refers to restructuring and C refers to raising capital, both in year t. The independent variables, X, are measured in year t-1 and include parent firm growth (GROWTH), the number of segments reported by the parent (NSEG), the percentage of unrelated segments (PERUNREL), return on assets (ROA), Altman's Z-score (ALTMANZ), industry shock (INDSH), cash deficit relative to assets (DEFRELA), Tobin's q (TOBIN), leverage ratio (LEV), indicator variable equal to 1 if the firm pays a dividend or repurchases shares (DIV), firm size (SIZE), current ratio (CRAT), and free cash flows (CFRELA). The Pseudo R-squared is 9.2%.

	$\beta_1$	$\beta_2$	$\beta_3$
GROWTH	-0.0050	-0.1639*	0.1389*
NSEG	0.0001	0.0107*	-0.0014
PERUNREL	0.0019*	0.0245*	-0.0142**
ROA	0.0018	-0.0801*	0.0092
ALTMANZ	-6.74e-6	1.06e-7	8.5e-7***
INDSH	-0.0004**	-0.0028**	-0.0007
DEFRELA	-0.0003	-0.0009	0.0075
TOBIN	0.0001	-0.0001	0.0018*
LEV	0.0014***	0.0022	0.0031
DIV	-0.0008	-0.0109*	-0.0150*
SIZE	0.0026*	0.0220*	0.0203*
CRAT	-0.0005***	-0.0079*	0.0010
CFRELA	0.0003	0.0618*	0.0214
INTERCEPT	-0.0297*	-0.2568*	-.2425*

\*, \*\*, \*\*\* represent significance at the 1%, 5%, and 10% levels respectively.

**Table 6**  
**Stage 2 Estimation – Asset Based (Changes)**

This table presents the marginal effects (p-values) for the pairwise logit estimations of restructuring choice. Pairs are based on the opportunity sets illustrated in Figure 1. The independent variables include the likelihood of restructuring and raising external capital (INV2), the likelihood of restructuring and not raising external capital (INV3), and specific parent and segment characteristics. Parent firm characteristics include the changes from year t-2 to year t-1, where year t is the year of the restructuring, in return on assets, Altman-Z score, leverage ratio, Tobin's q, size, growth, free cash flows, current ratio, and cash deficit. INDSH is the year t-1 abnormal industry sales. DECA is an indicator variable that takes a value of 1 if the firm's sales-based diversification discount increased from year t-2 to year t-1 and 0 otherwise. Diversification discount is measured in year t-1. Segment characteristics include the relative size of the segment, growth in sales, and return on assets. RELATED is an indicator variable that takes a value of 1 if the segment and parent firm are classified in the same Fama and French (1997) industry.

	Track vs Exch, Carve, or Sell	Exch vs Track, Sell, or Carve	Exch vs Spin or Track
INV2	0.0051	-0.0615**	-0.7985*
INV3	-0.0026	0.1187**	1.4874*
CROA	0.0122	0.0465	1.0996
CALTMANZ	-3.63e-6	0.0001	-0.0033
CLEV	0.0071	0.0448	-0.6066
CTOBIN	-0.0001	-0.0228**	-0.1965
CSIZE	-1.23e-8	-8.34e-7	1.41e-6
CGROWTH	-0.0022	0.0914	1.6592
CCFRELA	-0.0078	0.0867	0.4585
INDSH	0.0001	0.0034	0.1021***
CCRAT	-0.0003	0.0075	0.0454
CDEFRELA	0.0005	0.323	0.1145
DECA	-0.0006	0.0036	0.1429
UNDERVALA	-0.0009	-0.0042	0.0049
RELSIZE	-0.00001	0.0175	-0.1767
GSALES	-0.0002	0.0135	0.0783
SROA	-0.0017	0.0034	0.2612
RELATED	-0.0010	0.0006	-0.2478***
INTERCEPT	-0.0012	0.0432	-0.1683
Pseudo R-squared	0.3015	0.0875	0.2032

\*, \*\*, \*\*\* represent significance at the 1%, 5%, and 10% levels respectively.

**Table 6 (contd.)**  
**Stage 2 Estimation – Asset Based (Changes)**

	Carve vs Exch, Track, or Sell	Sell vs Track, Exch, or Carve	Spin vs Exch or Track
INV2	-0.0179	0.0716	0.5122
INV3	0.1042***	-0.2225**	-1.2619**
CROA	-0.1394	-0.0239	-2.1959
CALTMANZ	-0.00003	2.51e-6	0.0028
CLEV	0.0525	-0.1955***	0.3798
CTOBIN	0.0030	0.0162	0.2117
CSIZE	1.68e-6	3.11e-6	-2.34e-6
CGROWTH	0.2060**	-0.4236**	-2.7185
CCFRELA	0.0464	-0.1525	-0.0231
INDSH	0.0121	-0.0196	-0.1028
CCRAT	-0.0032	-0.0013	-0.0613
CDEFRELA	-0.0172	-0.0210	-0.0924
DECA	0.0260**	-0.0321***	-0.0626
UNDERVALA	0.0096	-0.0072	0.0259
RELSIZE	0.0203	-0.0503	0.2876
GSALES	-0.0081**	0.0102	0.0264
SROA	-0.0169	0.0002	-0.0960
RELATED	0.0038	-0.0005	0.3512**
INTERCEPT	-0.0400	0.0292	0.4021
Pseudo R-squared	0.1177	0.0801	0.1751

\*, \*\*, \*\*\* represent significance at the 1%, 5%, and 10% levels respectively.

**Table 7**  
**Stage 2 Estimation – Sales Based (Changes)**

This table presents the marginal effects (p-values) for the pairwise logit estimations of restructuring choice. Pairs are based on the opportunity sets illustrated in Figure 1. . The independent variables include the likelihood of restructuring and raising external capital (INV2), the likelihood of restructuring and not raising external capital (INV3), and specific parent and segment characteristics. Parent firm characteristics include the changes from year t-2 to year t-1, where year t is the year of the restructuring, in return on assets, Altman-Z score, leverage ratio, Tobin's q, size, growth, free cash flows, current ratio, and cash deficit. INDSH is the year t-1 abnormal industry sales. DECS is an indicator variable that takes a value of 1 if the firm's sales-based diversification discount increased from year t-2 to year t-1 and 0 otherwise. Diversification discount is measured in year t-1. Segment characteristics include the relative size of the segment, growth in sales, and return on assets. RELATED is an indicator variable that takes a value of 1 if the segment and parent firm are classified in the same Fama and French (1997) industry.

	Track vs Exch, Carve, or Sell	Exch vs Track, Sell, or Carve	Exch vs Spin or Track
INV2	0.0051	-0.0632**	-0.7217**
INV3	-0.0014	0.1202**	1.4134**
CROA	0.0130	0.0525	0.7859
CALTMANZ	-3.36e-6	0.0001	-0.0013
CLEV	0.0076	0.0507	-0.6366
CTOBIN	-0.0001	-0.0183***	-0.1518
CSIZE	-1.31e-8	-8.42e-7	1.74e-6
CGROWTH	-0.0046	0.0895	1.6935
CCFRELA	-0.0070	0.0861	0.7482
INDSH	0.0002	0.0027	0.0929
CCRAT	-0.0007	0.0075	0.0828
CDEFRELA	0.0016	0.0322	0.0006
DECS	0.0001	-0.0070	0.0145
UNDERVALS	-0.0006	-0.0023	0.0103
RELSIZE	-0.00003	0.0162	-0.1947
GSALES	-0.0002	0.0130	0.0564
SROA	-0.0015	0.0047	0.2796
RELATED	-0.0012	0.0001	-0.2341***
INTERCEPT	-0.0024	0.0522	-0.1641
Pseudo R-squared	0.2920	0.0880	0.1890

\*, \*\*, \*\*\* represent significance at the 1%, 5%, and 10% levels respectively.

**Table 7 (contd.)**  
**Stage 2 Estimation – Sales Based (Changes)**

	Carve vs Exch, Track, or Sell	Sell vs Track, Exch, or Carve	Spin vs Exch or Track
INV2	-0.0143	0.0668	0.4994
INV3	0.0931	-0.2096**	-1.2732**
CROA	-0.1265	-0.0432	-2.1225
CALTMANZ	-0.00004	0.00002	0.0019
CLEV	0.0549	-0.2022***	0.3960
CTOBIN	0.0071	0.0120	0.1958
CSIZE	1.45e-6	3.18e-6	-2.53e-6
CGROWTH	0.2186**	-0.4308**	-2.7231
CCFRELA	0.0556	-0.1600	-0.0963
INDSH	0.0136	-0.0194	-0.1005
CCRAT	-0.0001	-0.0054	-0.0781
CDEFRELA	-0.0136	-0.0253	-0.0481
DECA	0.0180	-0.0157	-0.0255
UNDERVALS	0.0046	0.00001	0.0187
RELSIZE	0.0205	-0.0507	0.3018
GSALES	-0.0081**	0.0100	0.0323
SROA	-0.0220	0.0015	-0.1064
RELATED	0.0041	-0.0003	0.3476**
INTERCEPT	-0.0270	0.0127	0.4172
Pseudo R-squared	0.1068	0.0756	0.1734

\*, \*\*, \*\*\* represent significance at the 1%, 5%, and 10% levels respectively.

**APPENDIX A  
VARIABLE DEFINITIONS**

	<b>Name</b>	<b>Description</b>
<b>Dependent Variables</b>		
Restructuring Only	<b>P(R=1, C=0)</b>	Indicator variable taking a value of 1 if firm <i>i</i> announced a restructuring in year <i>t</i> and 0 otherwise.
Restructuring and Issuing Capital	<b>P(R=1,C=1)</b>	Indicator variable taking a value of 1 if firm <i>i</i> announced a restructuring and the issue of debt or equity in year <i>t</i> and 0 otherwise.
Issuing Capital Only	<b>P(R=0,C=1)</b>	Indicator variable taking a value of 1 if firm <i>i</i> announced a issued debtor equity in year <i>t</i> and 0 otherwise.
Restructure Method	<b>SEG</b>	Based on divestiture choice opportunity set (see Figure 1). Opportunity set 1 consists of carve-out, sell-off, exchange, and tracking stock and opportunity set 2 consists of spin-off, exchange, and tracking stock. Each alternative is compared to the other choices in each opportunity set. For example, SEG is set equal to 1 if segment <i>j</i> is carved-out and 0 otherwise.
<b>Independent Variables</b>		
Diversification Discount	<b>UNDERVALA(S)</b>	Firm <i>i</i> 's asset (sales) based diversification discount at the end of year <i>t</i> -1. This variable is based on Berger and Ofek (1999). Details of the calculation are provided in Appendix B.

Deficit	DEFRELA	The firm's deficit, measured using a modified form of the Shyam-Sunder and Myers' (1999) deficit measure, relative to assets. A positive value indicates the firm is in need of cash.
Return on Assets	ROA	Firm <i>i</i> 's year t-1 return (EBITD) on average ending book value of assets.
Percentage of Unrelated Segments	PERUNREL	The percent of firm <i>i</i> 's segments that are unrelated. A segment is related if it is classified in the same Fama and French (1997) industry as the parent firm.
Growth	GROWTH	Firm <i>i</i> 's year t-1 capital expenditures divided by year t-1 total assets.
Tobin's Q	TOBIN	Firm <i>i</i> 's Tobin's Q at the end of year t-1. Measured by dividing the firm's market value (market capitalization less common equity plus total assets less balance sheet deferred taxes and investment tax credits) by the difference between assets and balance sheet deferred taxes and investment tax credits.
Financial Distress	ALTMANZ	Firm <i>i</i> 's Altman Z-score at the end of year t-1. This variable is based on Altman (1993). Details of the calculation are provided in Appendix C.
Leverage	LEV	Leverage (book value of debt/total assets) of firm <i>i</i> at the end of year t-1.
Dividend	DIV	Indicator variable taking a value of 1 if firm <i>i</i> pays a dividend or repurchases shares in year t-1.

	<b>Name</b>	<b>Description</b>
Firm Size	SIZE	Natural log of total assets of firm <i>i</i> in year t-1.
Current Ratio	CRAT	Current ratio for firm <i>i</i> in year t-1.
Free Cash Flow	CFRELA	A measure of the firm's free cash flow relative to assets. Cash flow is earnings before taxes and depreciation (EBITDA) less total taxes adjusted for changes in deferred taxes less interest expense less dividends.
Industry Shock	INDSH	Abnormal industry sales growth for previous 5 years. Measured as $\ln(\text{Sales year } t / \text{Sales year } t-4)$ , where sales are put in real terms using the GNP deflator, minus the average growth for all industries.
Inverse Mills Ratio	INV2(3)	Inverse Mills ratio from the estimation of the likelihood of restructuring and raising capital (the likelihood of only restructuring).
Change in undervaluation	INCREASE	Indicator variable taking a value of 1 if the parent firm's undervaluation (diversification discount) increases from year t-2 to year t-1 and 0 otherwise.
Relatedness Measure	RELATED	Indicator variable taking a value of 1 if segment <i>j</i> is related to firm <i>i</i> (based on Fama and French (1997) industry classifications) and 0 otherwise.
Segment Return on Assets	SROA	Segment <i>j</i> 's return on ending book value of assets.
Segment Growth in Sales	GSALES	Segment <i>j</i> 's annual rate of change in sales from year t-2 to year t-1.
Relative Size of Segment	RELSIZE	Total assets of segment <i>j</i> divided by the total assets of firm <i>i</i> in year t-1.

**APPENDIX B**  
**Diversification Discount Calculation**

The calculation for UNDERVAL follows the procedure developed by Berger and Ofek (1995).

$$I(V) = \sum_{i=1}^n AI_i (Ind_i(V/AI)_{mf}) \quad (8)$$

$$UNDERVAL = \ln(V/I(V)) \quad (9)$$

where

I(V)	Imputed value of the sum of a firm's segments as stand-alone firms.
AI <sub>i</sub>	Segment <i>i</i> 's value of the accounting item (sales or assets) used in the valuation multiple
IND <sub>i</sub> (V/AI) <sub>mf</sub>	Multiple of total capital to an accounting item (sales or assets) for the median single-segment firm in segment <i>i</i> 's industry
UNDERVAL	Firm's diversification discount
V	Firm's total capital (market value of common equity plus book value of debt)
N	Total number of segments in segment <i>i</i> 's firm

To measure the level of the firm's excess value, or diversification discount, I use the negative of UNDERVAL to represent the level of the discount. Specifically, a firm that is undervalued will have a positive UNDERVAL while an overvalue firm will have a negative UNDERVAL.

**APPENDIX C**  
**Altman's Z-score Calculation**

The calculation for ALTMANZ follows the procedure developed by Altman (1993).

$$Z = .012 X_1 + .0014 X_2 + .033 X_3 + .006 X_4 + .999 X_5 \quad (10)$$

where

- X<sub>1</sub> Ratio of working capital to total assets. A measure of the net liquid assets of the firm relative to the total capitalization.
- X<sub>2</sub> Ratio of retained earning to total assets. A measure of cumulative profitability over time.
- X<sub>3</sub> Ratio of earnings before interest and taxes to total assets. A measure of the true productivity of the firm's assets.
- X<sub>4</sub> Ratio of the market value of equity to book value of total liabilities. Determines how much the firm's assets can decline in value before it becomes insolvent when liabilities exceed asset value.
- X<sub>5</sub> Ratio of sales to total assets. Represents the sales generating ability of the firm's assets.

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