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Do Size And Diversification Type Matter? An Examination Of Post-bankruptcy Outcomes

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The Bankruptcy Reform Act of 1978 prompted a dramatic increase in the number of corporate Chapter 11 filings. The increase in corporate bankruptcy filings has been associated with a growth of literature examining factors leading to bankruptcy. However, minimal research has examined the fate of firms once bankruptcy has been declared (e.g., Altman, 1993; Daily, 1996; Hotchkiss, 1995; Moulton and Thomas, 1993). It is important to note that successful reorganization does not guarantee post-reorganization success. To date only one study, conducted by Hotchkiss (1995), has examined what happens to the bankrupt firm after reorganization (i.e., post-bankruptcy recovery).

In her sample of 806 firms, Hotchkiss found that only 24% (197) successfully reorganized and 49% (97) of those firms survived for five years after reorganization. Moreover, Hotchkiss found that the five-year post-reorganization performance of these 97 firms was significantly less than their respective industry averages. Additionally, Hotchkiss (1995) found evidence to suggest that retention of pre-bankruptcy management hindered post-bankruptcy performance.

We feel that a logical extension in this line of study is to examine the effect of diversification type and organizational size on post-bankruptcy outcomes. This is because strategic type has been found to affect transition performance and recovery times of

firms undergoing dramatic reorganization (Dawley *et al.*, 2002; Lamont *et al.*, 1994; Hoskisson, 1987), and that prior research suggests that larger organizations possess larger amounts of "slack" resources that can be drawn upon during difficult times (Flynn and Farid, 1991; Moulton and Thomas, 1993).

The current study examines the effect of diversification type and organizational size on probability of recovery and recovery times for firms emerging from bankruptcy protection. In this study, probability of recovery is defined to be the odds (or likelihood) that a bankrupt firm will return to a level of performance on par with its industry, and recovery time is the number of years it takes for a bankrupt firm to return to that level of performance.

The effect of organizational size on survival, reorganization, and post-bankruptcy performance seems important given the growing body of literature that suggests greater size (typically measured by a firm's total assets) engenders stakeholder support, community legitimacy, and assorted ecological selection enablers that may help keep the distressed firm afloat (Baum, 1996). Similarly, choice of diversification type might also enhance the performance of troubled forms (Grant, 1988; Hoskisson, 1987; Lamont *et al.*, 1994).

It is important to note that diversification strategy can take several forms, including geographic (e.g., degree of internationalization) and product. This study is concerned with product diversification strategy. Product diversification strategy is often defined as one of two types—related and unrelated (Rumelt, 1974; Hoskisson *et al.*, 1993; Palepu, 1985). Firms employing related diversification strategies typically sell one product line to one industry (often defined by a 2, 3, or 4-digit standard industry classification (SIC) code (e.g., Nike). Firms employing unrelated diversification strategies sell two or more product lines to two or more distinct industries (e.g., General Electric). The performance implications of employing either of these strategies are discussed below.

An organization's management has two choices when filing for bankruptcy. First, it can request time to formulate a reorganization plan with the intent of continuing operations known as "Chapter 11, Reorganization." Second, it can turn over control of the organization's assets to a court-appointed trustee. This trustee will then sell the assets and distribute the funds under "Chapter 7, Liquidation." This study concentrates on the Chapter 11 reorganization filings and considers Chapter 7 liquidation filings as organizational death. Thus, unless otherwise specified, bankruptcy will be used in the context of Chapter 11, reorganization filing. Furthermore, a successful reorganization is considered to exist whenever the reorganization plan is approved by the Bankruptcy Court. The existing research in bankruptcy has been examined from the financial and accounting perspective (e.g., Altman *et al.*, 1977), the legal perspective of asset distribution and venue (e.g., Bradley and Rosenzweig, 1992), the environmental perspective of corporate legitimacy and prestige (e.g., Thompson, 1967), and the behavioral perspective of the Board of Directors (BOD) and the Top Management Team (TMT) (e.g., Daily and Dalton, 1993, 1994a, 1994b; Hambrick and D'Aveni, 1992).

The following section reviews the relevant literature and then six hypotheses are developed. The remaining sections detail the methodology used to test our hypotheses, present the results of our analyses, and provide a discussion of our findings.

LITERATURE REVIEW AND HYPOTHESES

The Effect of Diversification Type on Organizational Outcomes

An abundance of literature has examined how diversification can reduce risk and improve long-term profitability (e.g., Lubatkin and Chatterjee, 1994). An often-cited reason for diversification comes from portfolio theory. Portfolio theory suggests that an individual investor can reduce the risk for a given portfolio by adding diverse and uncorrelated investments (e.g., stocks) to that portfolio.

Lubatkin and Chatterjee (1994) argued that portfolio theory has relevance within the domain of strategic management. However, empirical research on the relationship between corporate diversification and performance is mixed. Some research suggests that the most profitable form of diversification is to diversify into similar businesses (i.e., related diversification) rather than dissimilar businesses (i.e., unrelated diversification) (Rumelt, 1974; Palepu 1985; Lubatkin and Chatterjee, 1994). Conversely, Michel and Shaked (1984) found that unrelated diversifiers outperform related diversifiers. While more research than not supports the tenet that related diversifiers outperform unrelated diversifiers, there remains a lack of consensus.

Other research suggests that each form of corporate strategy is associated with a different set of economic benefits, and that the benefits realized by each strategy may be mutually exclusive (Teece, 1982). In the case of unrelated diversification the main economic benefits are economies of internal capital markets. Economies of internal capital markets implies that unrelated business units (owned by one firm) can be monitored more effectively by constraining them to a single internal capital market (e.g., headquarters) than by the external capital market *en masse* (Williamson, 1999). In short, economies of internal capital allow a stronger governance of optimal resource allocation.

In the case of related diversification, the main economic benefits are economies of integration and economies of scope. Economies of integration allows the firm to enjoy lower costs of production (Klein *et al.*, 1978), lower costs associated with managerial opportunism (Madhok, 2002; Williamson, 1999), and lower costs of writing contracts (Arrow, 1974). Economies of scope include synergies between business units and dominant logic. Synergies involve shared resources between channels for mutual gain (Madhok, 2002). Dominant logic suggests that firm relatedness, at the corporate level, affords corporate management the ability to conceptualize its total portfolio in a way to make better resource decisions (Prahalad and Bettis, 1986; Grant, 1988).

It is important to note that the primary difference between bankrupt firms and other firms is that bankrupt firms have fewer resources available to them with which to exploit the economic benefits associated with related diversification (Flynn and Farid, 1991; Hambrick and D'Aveni, 1988). They also have less resources availa-

ble to afford the higher bureaucratic costs associated with related diversification (D'Aveni, 1990; Hambrick and D'Aveni, 1988; Hotchkiss, 1995; Daily, 1994). Thus, in the case of bankrupt firms this may mean that they would not possess the resources or the time to exploit all of the economic benefits or afford all of the costs associated with related diversification. Indeed the only option for bankrupt firms may be to derive economic benefits from the liquidation of existing business units (Dawley *et al.*, 2002; Hotchkiss, 1995). Under this scenario it would be more beneficial for the bankrupt firm to be an unrelated diversified firm rather than a related diversified firm since an unrelated diversified firm is likely to have more liquidable business units in its portfolio (Hoskisson and Hitt, 1994). The coordination costs of liquidating business unit(s) would also be lower for unrelated diversified firms since each business unit functions as a self-contained unit (Williamson, 1999). Thus, it can be hypothesized that:

Hypothesis 1: Unrelated diversifiers have a greater probability of recovering from bankruptcy than related diversifiers.

Hypothesis 2: Unrelated diversifiers have shorter recovery times from bankruptcy than related diversifiers.

The Effect of Organizational Size on the Relationship Between Type of Diversification Strategy and Post-bankruptcy Performance Outcomes

Research in organizational ecology identifies several criteria that explain why some firms are more susceptible to failure (or success) than others. These criteria are typically referred to as selection processes, which explain sources and benefits of strategic choice for certain firms. For example, larger size confers legitimacy (Hannan and Freeman, 1977, 1984; Baum, 1996), mass dependence (Barnett and Amburgey, 1990), and niche overlap (Baum and Singh, 1994) advantages to firms that help them to better function and survive (Zimmerman and Zeitz, 2002). Larger firms also typically have more slack than smaller firms (Forte *et al.*, 2000; Hannan and Freeman, 1984), which can protect the organization against selection pressures and function as a "transformational shield" when major organizational change may be required that would reset a firm's liability of newness clock[1] (Baum, 1996), as is typical for bankrupt firms attempting to reorganize from Chapter 11 protection. Furthermore, antitrust restrictions may further prevent large organizations from merging or being acquired and also affect the probability of recovery (Moulton and Thomas, 1993). In short, selection pressures are mitigated by size and its frequent correlate, slack.

Few would disagree with the position that the performance effects of greater strategic choice should generally be positive. This tenet lies at the heart of much strategy and recent organizational ecology theory. Strategy researchers (c.f., Chen and Hambrick, 1995; Chen and MacMillan, 1992; Lubatkin and Chatterjee, 1994) frequently draw on a substantial literature in economics (e.g., Mason, 1959) to document that business

[1] Organizational ecology suggests that older firms are more likely to survive organization distress than newer firms. Thus, the liability of newness suggests that younger firms are more likely to fail than older firms.

firms with power over their environment will exploit their position and resource advantages to achieve financial gains. For example, larger rivals with dominant market positions typically shape industry competition by initiating the competitive moves to which smaller rivals must respond (Chen and Hambrick, 1995; Grimm and Smith, 1997).

In addition to these advantages, larger organizations typically have larger amounts of slack resources that can be drawn upon during difficult times (Flynn and Farid, 1991; Moulton and Thomas, 1993). Bourgeois (1981) defined organizational slack as the cushion of resources that allows an organization to successfully adapt to internal and external changes (e.g., recovery time). Because they have more absorbed (and perhaps unabsorbed) slack resources, it can be theorized that larger organizations should have a greater probability of surviving bankruptcy and they should have shorter recovery times from bankruptcy than smaller organizations. Specifically it is hypothesized that:

> Hypothesis 3: Larger firms have a greater probability of recovering from bankruptcy than smaller firms.

> Hypothesis 4: Larger firms have shorter recovery times from bankruptcy than smaller firms.

Given the likelihood that both strategy and organizational size can affect post-bankruptcy performance outcomes (Chang and Singh, 2000; Hrebeniak and Joyce, 1985; Marlin *et al.*, 1994), it can be theorized that diversification type and organizational size may interact to affect post-bankruptcy performance outcomes. Researchers typically operationalize organizational size by total assets (Dawley *et al.*, 2002; Moulton and Thomas, 1993; Daily, 1996). It can be reasoned that as firm size increases so would the firm's number of slack resources. These additional slack resources put larger bankrupt firms in a better position to exploit the greater economic benefits associated with related diversification. It also puts them in a better position to afford the bureaucratic costs associated with related diversification.

Because of these additional slack resources it can be theorized that larger bankrupt firms would be able to derive more benefits from related diversification than would smaller firms. In terms of post-bankruptcy performance, these benefits would lead to a greater probability of recovery for the firm and a shorter recovery time. Thus, the following is hypothesized:

> Hypothesis 5: Diversification type and organizational size interact to affect performance such that larger firms derive more benefit, in terms of greater probability of recovery, from related diversification than do smaller firms.

> Hypothesis 6: Diversification type and organizational size interact to affect performance such that larger firms derive more benefit, in terms of shorter recovery time, from related diversification than do smaller firms.

METHODS

Sample and Sources of Data

The population for this study is all publicly-held firms having total assets greater than $25 million, traded on one of the three major stock exchanges, and which filed for Chapter 11 reorganization (11 U.S.C. § SEC 1306(b) of the Federal Bankruptcy Code) between 1980 and 1992. The decision to examine only publicly-held firms with assets greater than

$25 million was made in order to increase the probability of finding sufficient data. The companies were identified based on records maintained by *New Generation Research*, publishers of **The Bankruptcy Yearbook and Almanac** (Daily, 1996).

In keeping with Hambrick and D'Aveni (1988) and Moulton and Thomas (1993), organizations belonging to regulated industries (i.e., railroads, insurance companies, banks, savings and loan associations, homestead associations, and credit unions) were deleted since they have their own special bankruptcy conveyances (e.g., the FDIC). A total of 528 organizations satisfied the restrictions and therefore represent the population.

Our time frame of interest was controlled by two factors. The starting year, 1980, is based on the first full year following the effective date of the Bankruptcy Reform Act of 1978 (i.e., October 1, 1979). The ending year of 1992 was selected to ensure all organizations sufficient opportunity to recover (or not) within the time frame of data availability.

From the population, 303 organizations were liquidated within one year, while 225 organizations survived immediate death and filed for reorganization. Since this study focused on diversified firms, 89 single business firms were deleted from the sample. This reduced the sample size to 136; there were 70 survivors and 66 non-survivors.

Dependent Variables

Recovery. Examination of the probability of organizational recovery required the use of a dichotomous dependent variable (RECOVERY). Either a firm exited bankruptcy protection and returned to performance parity with its industry (= 1, a recoverer) or did not (= 0, a non-recoverer). Consistent with prior turnaround research, we chose the accounting-based measure return on assets (ROA) (Hoskisson *et al.*, 1994; Hoskisson *et al.*, 1993). Recovery status was assessed in years two through five following the announcement of bankruptcy (Hotchkiss, 1995). Recovery was deemed to occur if the bankrupt firm showed two consecutive years of ROA greater than or equal to that for the relevant industry[2] (Pearce and Robbins, 1993).[3]

Recovery Time. Recovery time is the number of years between the approval of the reorganization plan by the Bankruptcy Court (T_{RO}) and the organization reaching performance parity with the rest of its industry ($T_{RECOVERY}$), as indicated above.

Independent Variables

Diversification Type. Diversification strategy was operationalized using Rumelt's (1974) classification scheme. Within the context of the current study, diversification type is a categorical variable which reflects one of two strategic types according to Rumelt's (1974) classification: related diversifiers (= 1) and unrelated

[2] Each firm's annual post-bankruptcy ROA was compared to the mean of its industry ROA (by 4-digit SIC code).

[3] We recognize that attaining an ROA comparable with the firm's pre-bankruptcy ROA would certainly be a reasonable threshold for recovery. In the spirit of prior turnaround strategy research, we prefer the measure used by Pearce and Robbins (1993).

diversifiers (= 2). Data regarding a firm's diversification type were determined from Annual Reports and 10K reports. Two independent professors in strategic management were asked to classify the 136 firms as either related or unrelated diversifiers. These professors initially agreed on the diversification strategies of 121 firms (89% initial agreement). The raters then met and came to consensus on the remaining 15 firms. The performance measures and other financial information for the control variables and recovery benchmarks were derived from the COMPUSTAT database, annual reports, and 10ks.

Size. Organizational size is operationalized as the natural log of total assets, and is consistent with prior post-bankruptcy research (i.e., Daily and Dalton, 1995). The natural log of full-time employees and sales revenue has also been used in the literature (e.g., Singh, 1986), and a high correlation has been found with the natural log of assets (Hotchkiss, 1995). Of these three measures, Moulton and Thomas (1993) found the greatest predictive utility by using the natural log of assets. Therefore, the natural log of assets will be used to measure size in this study. Consistent with prior research, the size variable will be that for the year bankruptcy was announced (Daily, 1995; Hotchkiss, 1995; Moulton and Thomas, 1993).

Interaction Between Size and Diversification Type. The interaction hypothesized in Hypotheses 5 and 6 requires multiplying the diversification type times the natural log of assets. The coefficient of the interaction term indicates the unit change in the probability of recovery by diversification type, given a unit change in size (Cohen *et al.*, 2003).

Control Variables

Daily argued that "effectively controlling for financial considerations may be particularly relevant for (post-) bankruptcy research" (1995: 1047). Altman (1993) found that three financial causes of bankruptcy are lack of pre-bankruptcy profitability, leverage, and liquidity. Typical proxy variables for these categories are: current assets divided by current liabilities (liquidity), long-term debt (leverage), and earnings before interest and tax (pre-bankruptcy profitability) (e.g., Daily and Dalton, 1995, 1994a; D'Aveni, 1990). These same control variables are used in the current study (i.e., liquidity, leverage, and pre-bankruptcy profitability). Including these control variables affords a close examination of the effects of diversification type and organizational size on post-bankruptcy performance beyond these financial considerations.

Prior literature suggests that retaining pre-bankruptcy management is associated with poor post-bankruptcy performance (Hotchkiss, 1995). Therefore we expect that CEO turnover will improve post-bankruptcy performance and should be included as a control variable. CEO turnover is a dummy variable and deemed to exist (=1) if the firm replaced its CEO within the first two full years after the Chapter 11 filing.

We standardized all dollar amounts to 1980 to adjust for inflation. Further, the general economy is also likely to affect post-bankruptcy performance. Over the last twenty years, there have been two recognized recessions (1981-1983 and 1989-1991) and one period of extraordinary growth (1994 to 1999). The expansive or recessive nature of the econ-

omy determines the cost of capital and thus is likely to affect post-bankruptcy performance. Therefore, the general economic condition, reflected by gross national product (GNP), is calculated as the percentage GNP growth (standardized to 1980 dollars) from the year bankruptcy was filed to the fifth year after bankruptcy was filed.

Data Analysis

Logistic regression was used to test Hypotheses 1, 3 and 5 since each hypothesis involves the use of a dichotomous dependent variable (i.e., probability of recovery). Cox regression was used to test hypotheses 2, 4 and 6 since each hypothesis involves the use of an interval dependent variable (i.e., recovery time). The methods chosen were deemed to be appropriate due to the expected relationship between the dependent variables and the multiple independent variables (Cohen *et al.*, 2003). Interaction effects (i.e., predicted in Hypotheses 5 and 6) were tested by multiplying size times the appropriate diversification type measure. Although different dependent variables were used, the relationship between the outcome of interest and the independent variables was modeled as follows:

$$Y_i = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + b_8X_6X_7 + e$$

where Y_i is the outcome of interest (RECOVERY, RECTIME), X_1 represents liquidity (LIQ), X_2 represents leverage (LEV), X_3 represents earnings before interest and tax (EBIT), X_4 represents CEO turnover (CEO TURNOVER), X_5 represents the GNP growth rate (GNP), X_6 represents diversification strategy type (DIVERSIFICATION STRATEGY), X_7 represents SIZE and X_6X_7 represents the interaction of size and diversification type.

RESULTS

Item means and standard deviations were calculated, and a correlation analysis was performed using all variables. Logistic and Cox regressions were used to analyze the data. Table 1 presents the descriptive statistics and correlations for all variables.

Hypotheses 1, 3 and 5 were tested using logistic regression where diversification type and organizational size were the independent variables and the dependent variable was recovery. The results are presented in Table 2. Results from this analysis support Hypothesis 1 that unrelated diversifiers have a greater probability of surviving bankruptcy than related diversifiers. Results also support Hypothesis 3 that larger firms have a greater probability of surviving bankruptcy than smaller firms. The results also offer support for Hypothesis 5 that diversification type and organizational size interact to affect performance such that larger firms derive more benefit, in terms of a greater probability of recovery, from related diversification than do smaller firms. This interaction is shown in Figure I. For larger firms, related diversifiers have a greater probability of recovery than unrelated diversifiers.

Hypotheses 2, 4 and 6 were tested using a three-stage regression technique where the Rumelt classification was the independent variables for diversification type and recovery time was the dependent variable. The results are presented in Table 3. These results do not support Hypothesis 6 that diversification type and organizational size interact to affect per-

Table 1

Means, Standard Deviations, and Bivariate Correlations

	Mean	St. Dev.	1	2	3	4	5	6	7	8
1) DIVERSIFICATION TYPE	1.24	.43								
2) SIZE	5.13	1.68	.164*							
3) RECOVERY	.53	.50	.095	.366***						
4) RECOVERY TIME	5.25	4.19	.261**	-.474***	†					
5) LEVERAGE	4.05	37.88	-.036	-.039	.072	.022				
6) LIQUIDITY	1.32	.81	.092	.101	.034	-.122	.084			
7) EBIT	-.17	.17	.109	.316***	.173*	.015	.066	.077		
8) CEO REPLACEMENT	.28	.45	-.046	.120	-.047	.021	-.071	.071	.228**	
9) GNP CHANGE	1.03	.01	-.079	-.088	-.111	-.078	-.079	.139	-.062	.057

† No correlation value between recovery and recovery time because by definition non-recoverers had no recovery time.

*** $p < .001$

** $p < .01$

* $p < .05$

Table 2

Logistic Regression Analysis:

Determinants Of Post-bankruptcy Recovery

Variable	β
Intercept	-9.803***
LEVERAGE	.031
LIQ	-.023
EBIT	.944$^{\tau}$
GNP CHANGE	.020
CEO REPLACEMENT	-.230
DIVERSIFICATION TYPE	2.985***
SIZE	1.112**
SIZE x DIVERSIFICATION TYPE	-.445**
Chi-square	31.861***
Pseudo R^2	.19

*** $p < .001$

** $p < .01$

$^{\tau}$ $p < .10$

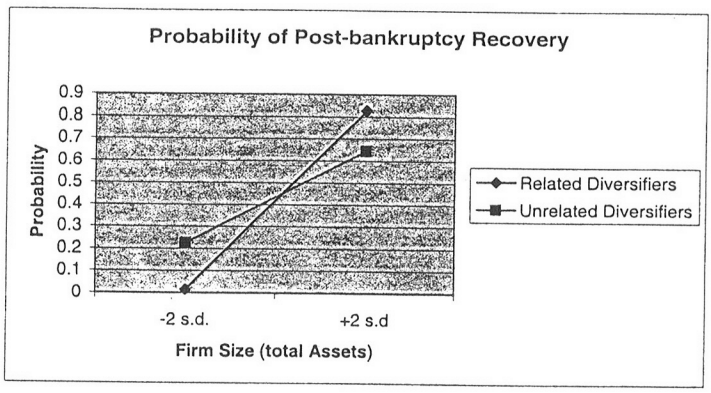
formance such that larger firms derive more benefit, in terms of shorter recovery time, from related diversification than do smaller firms. They also do not support Hypothesis 2 that unrelated diversifiers have shorter recovery times from bankruptcy than related diversifiers. Instead, they indicate that the greater the amount of related diversification a firm has the shorter its recovery time will be from bankruptcy. The results do, however, support Hypothesis 4 that larger firms have shorter recovery times from bankruptcy than smaller firms.

DISCUSSION

In this study, it was hypothesized that size would affect probability of recovery and recovery time from a Chapter 11 filing. It was also hypothesized that diversification type and organizational size would interact to affect the recovery time and the probability of recovery for firms emerging from a Chapter 11 filing. Four out of the six hypotheses were supported.

Findings support Hypothesis 1 that unrelated diversifiers have a greater probability of surviving bankruptcy than related diversifiers. Findings also support Hypothesis 3 that larger firms have a greater probability of surviving bankruptcy than smaller firms. Further, findings also indicate that diversification type and organizational size interact to affect performance such that larger firms derive more benefit, in terms of a greater probability of recovery, from related diversification than do

Figure I. The Interaction Between Size and Diversification Type on the Probability of Recovery



Organizational size is operationalized as the natural log of total assets. The mean size (i.e., the natural log of total firm assets) is 5.63 and standard deviation is 1.63. Each diversification type is plotted using $\pm$ 2 standard deviations as endpoints. In 1980 dollars, the mean firm size was \$279 million (i.e., $e^{5.63} = 279$ million). Logistic regression yields as output, the logit(Y). Probability is calculated as $P = e^{logit(Y)} / (1 + e^{logit(Y)})$ (Cohen *et al.*, 2003).

smaller firms. These results support Hypothesis 5.

Hypothesis 6 states that diversification type and organizational size interact to affect performance such that larger firms derive more benefit, in terms of shorter recovery time, from related diversification than do smaller firms. This hypothesis was not supported. However, significant main effects were found for both diversification type and size. Specifically, it was found that although unrelated diversification leads to a greater probability of surviving bankruptcy, it also leads to longer recovery times from bankruptcy. This finding did not support Hypothesis 2 that unrelated diversifiers have shorter recovery times than related diversifiers. To the contrary, the results suggest that the opposite is true. This finding makes sense given that those related diversified firms which do survive would have greater economic benefits available to them (than their unrelated diversified counterparts) and that these greater economic benefits lead to a shorter recovery time.

Although Hypotheses 2 and 6 were not supported, support was found for Hypothesis 4 that larger firms have shorter recovery times from bankruptcy than smaller firms. These results are similar to those found when firm recovery was being examined. These results support the idea that increased levels of organizational slack afforded by larger organizations lead to a speedier recovery.

Findings from this study have theoretical, methodological and managerial implications. Perhaps the most important theoretical implication addresses the relationship between diversification type and post-bank-

Table 3

Cox Regression Analysis:

Determinants of Recovery Time.

Variable	β
LEV	.001
LIQ	.059
EBIT	2.359
GNP CHANGE	.001
CEO REPLACEMENT	-.284
DIVERSIFICATION TYPE	2.451*
SIZE	-1.294***
SIZE x DIVERSIFICATION TYPE	-.131
Adjusted R^2	.26
Model F	5.141***

*** $p < .001$

* $p < .05$

ruptcy performance. While the literature provides mixed findings, a great deal of research suggests that related diversifiers will outperform unrelated diversifiers (Rumelt, 1974; Palepu, 1985). Findings from the current study suggest that larger bankrupt firms benefit more from related diversification in terms of probability of recovery than do smaller firms. The results also suggest that bankrupt firms benefit more from related diversification in terms of shorter recovery times no matter what their size. Findings from the current study also suggest that research on post-bankruptcy performance outcomes may have ignored two important variables and that size, diversification type, and their interaction should be considered in future research regarding post-bankruptcy performance. It is also possible diversification type and size interact to affect the performance of other firms as well. The fact this relationship has not been examined by prior research efforts may be one reason why there has been a lack of consensus in the literature regarding the effect of corporate diversification on firm performance.

Additionally, we note the general effects of our control variables on post-bankruptcy performance. The correlation analysis showed that pre-bankruptcy profitability (EBIT) was positively correlated $r = .316$, $p < .001$) with recovery, and this is in line with the findings of Hotchkiss (1995), Daily (1996) and D'Aveni (1990). Unlike studies by Daily (1996) and D'Aveni (1990), we found no evidence that liquidity was associated with post-bankruptcy performance. One possible explanation for this lack of corroboration is that we used a dif-

ferent operationalization for post-bankruptcy performance than prior researchers. While we used a dichotomous variable to reflect whether or not a firm returned to performance parity with its industry, Daily (1996) used successful reorganization, and D'Aveni (1990) used continued survival for one to four years after the initial bankruptcy filing as indicators of post-bankruptcy performance. Our study, like that of Dawley *et al.* (2002), Hotchkiss (1995), Daily (1996), and D'Aveni (1990), found no association between leverage and post-bankruptcy performance. This non-finding calls into question the utility of using leverage as a control variable in future research. Leverage is used to assess the firm's ability to acquire new debt, and perhaps the mere stigma of being bankrupt is enough to void any lender interest.

Contrary to the findings by Hotchkiss (1995), we found no association between CEO turnover and post-bankruptcy performance. The key difference between the two studies is that Hotchkiss (1995) operationalized CEO retention (i.e., no CEO turnover) as existing if the CEO was in office at least two years prior to the Chapter 11 filing and remained in office through the time the plan of reorganization was implemented. Our study operationalized CEO retention as existing if the CEO remained in office for at least two years after the Chapter 11 filing. In our sample, 51% (70) of the bankrupt firms implemented a reorganization plan in less than 24 months. Thus, we often tracked CEO turnover beyond reorganization. Perhaps the lack of corroboration between the two studies is due to the difference in time frames for assessing CEO turnover.

From a methodological perspective it is interesting to note that the two post-bankruptcy measures used in the current study (i.e., probability of recovery and recovery time) generated different results. This indicates that the two measures are measuring different things and should not be used interchangeably.

From a practical perspective our findings indicate that diversification type and organizational size interact to affect performance such that larger firms derive more benefit, in terms of a greater probability of recovery, from related diversification than do smaller firms. Our findings also indicate that although unrelated diversification leads to a greater probability of surviving bankruptcy, it also leads to longer recovery times from bankruptcy. Managers of smaller firms should especially take note since our findings suggest that although small firms with unrelated diversification will have greater probability of recovery, they will also have longer recovery times than their counterparts. While the manager has little *a priori* control over size and diversification type, it may be helpful to understand potential hindrances to successful recovery and recovery time. Understanding that size moderates the relationship between diversification type and the probability of recovery and recovery time, the manager should be cognizant that smaller organizations have fewer tools with which to survive and recover. Thus, managers of smaller firms may be well advised to look into strategic options such as liquidation or selling out to another firm. Although such action would not allow the organization to survive, it may be the best option for maximizing shareholder wealth.

One limitation associated with the current study concerns the time frame in which diversification type and organizational size were addressed. These variables were determined from Annual Reports in the year prior to the announcement of bankruptcy. While examining the diversification type a firm was using the year prior to the announcement of bankruptcy was appropriate for the current study, an obvious extension of this research would be to examine the strategic types of organizations which successfully recovered, assessed at the time of the actual reorganization approval and recovery. Any changes in diversification type over this time period could also be examined and interpreted.

Another limitation involves the degree to which the business segments in each firm were coordinated and integrated. Prior research suggests that distressed overdiversified (and often unrelated) firms appreciate performance gains by refocusing (Markides, 1995; Barker and Duhaime, 1997; Pearce and Robbins, 1993). An underlying assumption in this prior research is that these refocusing firms were relatively loosely coordinated and integrated, thus facilitating the refocusing process. We make the same assumption in the present study, but note that we had no real way of assessing each firm's degree of integration and coordination.

Finally, we recognize that the use of ROA as our dependent variable might be limited. In an industry that has several profitable (via ROA) firms, it might be unrealistic for a perennially poor (and now bankrupt) performer to attain an ROA at or above the industry average. Therefore, it is possible that a bankrupt firm makes great performance improvements, but fails to recover according to our industry average ROA threshold.

In general, we hope that this study will provide a basis for future research in the area of post-bankruptcy outcomes. We also hope that this study will provide managers of bankrupt firms insight regarding the roles of size and diversification type as an organization attempts to emerge from a Chapter 11 filing.

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