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Synergies and Post-Acquisition Performance: Differences versus Similarities in Resource Allocations

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Theory suggests that synergy is an essential ingredient for value creation to occur as a result of acquisitions. This dominant theory often argues for similarities among resources in the acquiring and target firms. However, it is argued here that uniquely valuable synergy might be created where differences (versus similarities) exist between resources in the acquiring and target firms. Tests of these competing hypotheses confirmed that differences contributed significantly to performance in the merged firm. This finding may suggest that traditional distinctions between related and unrelated mergers may not be as useful as once thought. A focus on specific resources rather than strategy types in the merger and acquisition research may better explain firm performance.

Acquisitions became increasingly popular during the 1970s and 1980s (Lamont & Anderson, 1985; Porter, 1987). As a result, the acquisitive growth strategy has been the subject of a significant number of research studies in finance and economics (e.g., Auerbach, 1988; Coffee, Lowenstein, & Rose-Ackerman, 1988; Jensen & Ruback, 1983; Roll, 1986; Varian, 1988) and strategic management (e.g., Barney, 1988; Chatterjee, 1986, 1990; Hitt, Hoskisson, Ireland, & Harrison, in press; Lubatkin, 1983; Salter & Weinhold, 1979; Singh & Montgomery, 1987).

Although a range of benefits may be sought through acquisitions, the evidence suggests that, in general, acquisitions are completed to maximize a firm's value (Salter & Weinhold, 1979). The dominant theory regarding how this value can be

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created suggests that firms acquire other firms with some form of relatedness, thereby creating efficiency through synergy. Synergy usually implies that gains accrue to the acquiring firm through two sources: (a) improved operating efficiency based on economies of scale or scope; (b) some kind of skill transfer (Ansoff, 1965). Some suggest that synergistic efficiencies produce market power over competitors (Bradley, Desai, & Kim, 1983; Eckbo, 1983; Montgomery, 1985; Stewart, Harris, & Carleton, 1984). Significant effort has gone into describing how these two sources of strategic relatedness exist between acquiring and target firms before value can be created (Chatterjee, 1986; Porter, 1987; Salter & Weinhold, 1979; Singh & Montgomery, 1987).

Research results, however, indicate that returns to acquiring firms do not support the dominant hypothesis that related acquisitions produce more value. Lubatkin (1987), for instance, found no significant difference in returns for shareholders of related versus unrelated firms. Singh and Montgomery (1987), although meticulously controlling for type and degree of synergy, found that above normal returns were not generated for acquiring firms. Furthermore, although they found that related acquisitions outperformed unrelated acquisitions when total value was considered, this value was captured by the shareholders of the target firm.

Barney's (1988) proposition that synergy may be a necessary but not a sufficient condition to obtain value for the acquiring firm may offer insight regarding these findings. Although the combination of acquiring and target firms may create greater total value, the economic reality of the bidding process under semi-strong capital market efficiency (Fama, 1970) results in the majority of the value being distributed to target firm shareholders. Barney (1988) proposes, therefore, that value is created for the acquiring firm when private and uniquely or inimitable valuable cash flows exist between the acquiring and target firms. *Uniquely* or *inimitable* cash flows exist when one bidding firm will benefit more than other bidding firms from the synergy created through merger. *Private* means that information concerning this advantage may be known only by the acquiring firm.

This research examines the notion that unique differences between acquiring and target firms may create more value than similarities. Specifically, resource allocation pattern differences are measured. These differences may represent dissimilarities in available information (asymmetric information between potential bidders), private synergy between bidder and target, and possibly differences due to luck. This analysis is based on the assumption that these differences (compared to similarities), although they are noticed, may be less likely to be acted upon (result in a bid) by potential bidders. Therefore, the competitiveness of the bidding is reduced, creating a bilateral monopoly where the acquiring firm is able to extract as much value as the target firm. It is the presence of an auction that allows target firms to extract more from the negotiation. However, we propose that differences (in resource allocations), compared to similarities, reduce the possibility of an auction.

Unlike the typical output (products and markets) techniques for measuring acquiring and target firm relatedness, a resource-based approach is used (Wernerfelt, 1984). Both aspects of synergy (economies of scale and scope and skill transference) imply similarity of tangible and intangible resources between acquiring

and target firms as the source of knowledge for value creation (Porter, 1985). Similarity in resource allocations to key areas may also be an indication of similarity in strategies (Beard & Dess, 1981; Galbraith & Kazanjian, 1986). Therefore, resource allocations provide a rich base for the study of similarities between acquiring and target firms and the associated performance outcomes resulting from their merger.

The influence of resource allocation similarities on acquisition decisions was studied explicitly by Lemelin (1982), MacDonald (1985), Montgomery and Hariharan (1987), and Stewart et al. (1984). Although they found that similarity in resource allocation may be a predictor of merger behavior, they did not relate merger outcomes to performance or found no relationship. The purpose of this research is to examine performance implications of different versus similar resource allocation patterns between acquiring and target firms. We argue that this approach is more complementary to the resource-based view of the firm than the traditional division between related and unrelated merger groupings because it focuses on specific resources rather than strategy types. As indicated above, the research using strategy types has yielded mixed results. The approach used here, therefore, asserts that resource allocation differences (between acquiring and acquired firms) are at least as likely as similarities to create value. This is because these differences may represent pursuit of uniquely valuable synergy in areas not recognized or understood fully by rival firms that would drive up the bidding price for the target when similarities are present. Thus, alternative hypotheses for performance effects of similarities versus differences in resource allocations are developed in the next section.

Synergy: Similarities Versus Differences in Resource Allocations

Synergy and Similarity

As noted above, acquisitions represent an investment intended to create economic value, especially through the development of synergies. Achievement of synergy may imply economies of scope (e.g., utilization of resources from one unit for the operation of another unit) (Panzer & Willig, 1981; Rumelt, 1982; Teece, 1980). It is commonly argued that synergy may be achieved through acquisitions because of similarities in acquiring and target firms' business level operations (Ansoff, 1965). These similarities produce greater economies of scale and scope, thereby creating synergy. Acquisitions that produce corporate level synergies may be linked even more closely with improved performance than those that create operational level synergies (i.e., the achievement of economies of scale) (Grant, 1988; Prahalad & Bettis, 1986). Corporate level synergy can be created in terms of marketing and R&D skills, among others (Yavitz & Newman, 1982).

Acquisitions of target firms with operating and corporate strategic similarities to the acquiring firm are expected to produce significant synergies and improved financial performance. A resource-based perspective of firm strategy (Wernerfelt, 1984) suggests that merged firms with similarly high or low relative resource allocations to critical areas could be expected to enjoy greater performance improvements as compared to merged firms with widely disparate resource allocations. Thus, a resource profile may predict the types of acquisitions that a firm will

pursue (Chatterjee & Wernerfelt, 1988; Stewart et al., 1984) and the performance outcomes from these acquisitions.

Furthermore, target and acquiring firms that are at the same stage of the value-added stream have similar resource allocation patterns and should, therefore, enjoy synergies that are not feasible for other merging firms. For instance, those firms that engage in raw materials extraction and primary manufacturing (upstream companies) differ fundamentally from firms that produce and market finished goods (downstream companies) (Galbraith, 1983; Galbraith & Kazanjian, 1986; Nathanson & Cassano, 1982; Tregoe & Zimmerman, 1980). These differences call for unique resource-allocation patterns. Upstream companies seek efficiency through standardization, process innovations, and engineering breakthroughs. These companies sell generic, not differentiated products. Upstream firms probably have similar goals (e.g., a focus on engineering quality products) and may have similar dominant logics (e.g., similar managerial approaches for allocating resources) (Pralhad & Bettis, 1986).

A second group of distinctive firms is labelled downstream. The dominant managerial logics observable in these firms result in resource allocations that differ from those occurring in upstream companies. In downstream companies, significant amounts of resources are allocated to emphasize marketing skills, product innovation, and product customization. These emphases are required to facilitate satisfaction of specific customer needs. Thus, if acquiring and target firms are both downstream companies, they should have similar resource allocation patterns that lead to greater synergies and higher post-acquisition performance.

These arguments suggest that similar resource allocation patterns between acquiring firms produce synergy that results in higher performance. Similar resource allocations may signal similar distinctive competencies (Hitt & Ireland, 1986; 1985) and/or similar dominant managerial logics (Grant, 1988; Prahalad & Bettis, 1986).

Synergy and Similarities: Research Evidence

Despite the appeal of the concept of synergy as developed above, the evidence concerning acquisition relatedness and performance is not consistent. Several researchers (e.g., Kusewitt, 1985; Shelton, 1986; Singh, 1983; Singh & Montgomery, 1987) reported that acquisitions completed to exploit relatedness across units lead to higher performance. Others have reported different findings. For example, Elgers and Clarke (1980) discovered that unrelated, compared to related, acquisitions provide higher returns to stockholders of both the acquired and acquiring firms. Chatterjee (1986) traced investor expectations by measuring abnormal returns surrounding the announcement of an acquisition and discovered that unrelated mergers outperformed related mergers. Dubofsky and Varadarajan (1987) found that unrelated diversified firms had higher market performance than related diversified firms. In addition, Lubatkin (1987) and Lubatkin and O'Neill's (1987) results did not support the argument that any particular form of relatedness resulted in superior financial performance.

Thus, the results concerning the effects of relatedness on performance are not consistent. Kusewitt (1985) suggested that the variation in performance outcomes

is dependent largely on the degree to which synergy is obtained and on the marketplace value that is created by that synergy. Furthermore, because of the emphasis on relatedness in the scholarly and popular literatures, most acquisitive growth firms seek target firms for acquisitions that have similarities (Hitt et al., in press; Stewart et al., 1984). Their purpose is to create synergy through economies of scale or scope or through transference of skills. However, Jensen (1988) notes that returns to acquiring firms on average have varied closely around zero (zero or slightly positive). These conflicting findings on relatedness and the weak performance outcomes from acquisitions may be explained partially by arguments related to how synergies may be created and measured. The logic developed below suggests that differences may be, in fact, more appropriate for creating value than similarities. Furthermore, a focus on differences in resource allocation patterns does not require a focus on related versus unrelated acquisition categories associated with previous research.

Unique and Complementary Synergies and Differences

Barney (1988) suggests that, in the bidding process for targets, acquiring firms receive above normal returns when private or uniquely valuable synergistic assets are involved. This situation is likely to arise when a target firm is worth more to one bidder than it is to any other. The price of the target firm will rise to reflect the public information available about the target. However, the special bidder will win the bid because the target is worth more due to the uniquely valuable synergy created between the acquiring and target firms. We assert that the possibility of uniquely valuable synergy is more likely to occur under dissimilar resource allocations rather than similar resource allocation patterns. This assertion is supported by theory (Barney, 1986) suggesting that greater value is created by differences in strategy characteristics or resources than by similarities. Specifically, Barney (1986) notes:

For a strategy of diversification through acquisition, this implies that firms that fail to discover *unique* synergies between themselves and potential acquisitions, but rather rely only on publicly available information when pricing an acquisition, can only expect normal returns from their acquisitions, though these firms might be lucky and acquire a firm with an unanticipated synergy (1239).

Most bidding firms are likely to have similar resource allocation patterns to the target firm and, therefore, similar expectations for post-merger performance (Lemelin, 1982; MacDonald, 1985; Montgomery & Hariharan, 1987; Stewart, et al., 1984). However, as noted earlier, past research indicates that there is no consistent relationship between relatedness, as measured by similarity, and improved value (possibly due to the bidding process involved). Although some resources such as R&D (MacDonald, 1985, Stewart, et al., 1984) and advertising (Stewart, et al., 1984) may be considered "intangibles," they may not be idiosyncratic and non-transferrable. Obviously, the acquiring firm believes that the target firm has assets that are employable in the merged firm. Because multipoint competition may exist, Porter (1985) suggests that bidding firms acquire similar targets because bidding firms have similar strengths. This is exemplified by R.J. Reynolds'

purchase of Nabisco, and the Philip Morris purchase of General Foods, due to the similarity of their strengths developed in the tobacco industry. Because the two bidding firms have similar strengths they both acquired food product firms. They both, therefore, could have been bidders for either firm, thus creating an auction. Similarities, therefore, imply common expertise and knowledge developed through competition. This knowledge increases the probability of an auction.

Differences between bidder and target, on the other hand, are not imbued with such implied knowledge among potential bidders. A bid for a target firm with resource allocation patterns different from the bidder may not stir competitors (of the bidder) to offer a similar bid. However, differences do not imply the lack of synergy between target and bidder, especially if the synergy is considered private. Therefore, a bidder with private synergy based on differences in resource-allocation patterns is likely to have an advantage because other potential bidders may not recognize nor have the private synergy involved and therefore, will not enter the auction. Thus, a bilateral monopoly situation is more likely to evolve for the bidding firms where these differences exist, and the acquiring firm may retain more of the total value involved in the acquisition.

It is important to note that differences in resource-allocation patterns (versus similarities) as an indicator of private synergy do not require the use of related or unrelated categories. If differences are involved and synergy is private, the degree of relatedness (or unrelatedness) is immaterial. Thus, a focus on differences, where private synergy is involved, may help an acquiring firm avoid the "winner's curse" problem (Varaiya, 1988), where target firm shareholders gain most of the value from an acquisition.

Additionally, Barney (1988) suggested that above normal returns can be generated for the bidding firm in combination with the target firm if the synergistic relationship is not imitable by other potential bidding firms. Thus, even if other bidders are aware of the relationship, but cannot duplicate the synergy, competitive bidding dynamics are stifled. In this case, similarity of resource allocation patterns would be independent of the value created in the acquisition. Therefore, differences may create value either through asymmetric information between potential bidders or through uniquely valuable synergy that is not imitable by potential bidders.

Furthermore, it is possible that an acquiring firm may win an auction and pay full price and avoid the winner's curse. That is, an acquisition may yield outcomes that exceed those expected by chance. If differences in resource-allocation patterns in general, however, produce a less competitive auction even when luck is involved, then the odds are that more value will be created because the competitive price for the target would be lower.

The above arguments pertain to synergy associated with differences that are uniquely valuable, those created through asymmetric information, and those that produce lucky gains. However, differences in resource allocations may also be associated with complementary distinctive competencies.

Hitt and Ireland (1986; 1985) found that firms may develop multiple distinctive competencies. Because of complementary competencies, merging two firms may create value by overcoming and controlling weaknesses in one or both merger

partners. For example, a firm with strong expertise in manufacturing specific types of products may acquire a firm with strong R&D expertise. Combining the two sets of expertise may allow the merged firm to be more innovative as well as efficient in the manufacture and distribution of the new products (Williamson, 1975: 197-199).

There are theoretical notions supporting the creation of synergy through integration of the differences in resources between acquiring and acquired firms (Salter & Weinhold, 1979). For example, historical differences between the two firms in allocations to capital investments likely result in relatively high degrees of variance in the types of capital equipment used and the types of skills that employees possess. In this instance, the merged firm may be able to use the unique capabilities of dissimilar capital equipment in order to respond rapidly and "opportunisticly" to favorable environmental (e.g., market) conditions. For example, a food processing firm might acquire a packaging manufacturer. This may represent a form of vertical integration. Special packaging in which to pack and distribute food products may be designed and manufactured in-house. Not only may the packaging be more specialized to fit the unique needs of the acquiring firm, it may be produced more efficiently, thereby creating value. Such synergy may help the acquiring firm respond more quickly to competitors' packaging and pricing decisions. Synergy from these differences may be difficult for other bidders to recognize, understand, and/or imitate, at least for a period of time, and thus may offer temporary competitive advantages.

Furthermore, research supports the notion of complementarities. For example, Hitt et al. (in press) found that firms in high R&D intensive industries tended to acquire companies in more mature industries with lower R&D. The reverse situation is also common among acquisitions. Certainly, a common objective of mature firms is to diversify into younger and growing markets (Smith & Cooper, 1988). Hill (1988) found that firms often sought joint venture partners with different but complementary distinctive competencies to their own. Hitt, Hoskisson, and Ireland (1990) argued that acquisitions may serve as a substitute for innovation. For example, firms may acquire target companies with technology different from their own. In so doing, the firm may add to its product line without the high risks involved in internal innovation (Biggadike, 1979). Therefore, the acquired technology is new to the firm and may be complementary to the firm's other technologies.

Thus, there are competing arguments with respect to the creation of synergy through acquisitions. The purpose of this research is to examine these competing arguments by analyzing the effects of similarities/differences in resource-allocation patterns between acquiring and target firms on the performance of the resulting merged firm.

Competing Hypotheses

To examine these competing arguments, resource allocations on four key strategic variables were used: capital intensity, administrative intensity, interest intensity, and R&D intensity. These variables each have two characteristics that make them suitable for use in this study. First, they each refer to allocations that can be

influenced significantly by strategic managers. Second, each resource has strategic implications. Two of the measures have been used previously in research examining the effect of acquisitions. Capital intensity was used by Amit, Livnat, & Zarowin (1989) and R&D intensity was used by Hitt et al. (in press) and Hall (1988). Furthermore, acquiring firms often use debt to finance acquisitions (Hitt et al., 1990). The use of debt and unused debt capacity can be regarded as a resource (Modigliani & Miller, 1958; Donaldson, 1961). Debt capacity is largely determined by the cost of debt (interest) because of its importance to the cash flow of the firm. Finally, a critical variable for acquisitions is the amount of resources expended in the process of searching for and evaluating potential target firms, negotiating the acquisition and integrating the acquired firm into the acquiring firm (Hitt et al., 1990; Kerr & Slocum, 1987). These resources are reflected in administrative intensity. Using these four variables, the following alternative hypotheses were formulated:

H1: Similarities in the capital intensity, administrative intensity, interest intensity and R&D intensity allocation patterns between acquiring and target firms are related positively to performance in the post-acquisition firms.

H2: Differences in the capital intensity, administrative intensity, interest intensity and R&D intensity allocation patterns between acquiring and target firms are related positively to performance in the post-acquisition firms.

Methods

Standard and Poor's COMPUSTAT research file formed the merger identification pool. This file contains annual financial statement data for approximately 2000 firms that have been acquired in the past 20 years. These firms were then matched to their acquirers using *Moody's Industrial Manual* and the Large Merger Series published by the Federal Trade Commission. Approximately 1,100 acquired firms were matched successfully to companies that are also found in the COMPUSTAT database. These mergers formed the sample used in this study and covered the years 1970-1989. However, the number of mergers included in each statistical test was constrained by the amount of inadequate or missing data.¹

Variables

Intensity was measured similarly for all four resource allocation variables examined. Capital, administrative (selling, general, and administrative), debt (interest expense) and R&D intensities were calculated by dividing the dollar amount of expenditures by total revenues. A difference score was calculated by taking the absolute value of the difference between the variables in the acquiring and acquired firms. The year prior to merger was the base year used in these calculations. Because there is no reason to expect a perfect linear relationship between the difference scores and performance, the performance hypotheses were also tested using

¹Complete data were available for 441 mergers in the capital intensity tests, 396 in the administrative intensity tests, 429 in the debt intensity tests and 198 in the R&D intensity tests.

reciprocal, logarithmic, square, and square root transformations of the difference score variables (Johnston, 1972).

ROA (return on assets) was the dependent variable. In strategic management, a review of the literature reveals a number of accounting return studies (e.g., Bettis & Mahajan, 1985), although more recently market-based performance measures have been adopted (Chatterjee, 1986; Dubofsky & Varadarajan, 1987; Hitt & Ireland, 1986; Lubatkin, 1987). It is interesting to note that although accounting measures have been the subject of considerable debate in economics (Bentson, 1985; Fisher & McGowan, 1983), they have been defended and remain in use in that field (Jacobson, 1987; Long & Ravenscraft, 1984). They also continue to be used by strategy researchers. Similarly, Holzmann, Copeland, and Hayya (1975) felt that the exclusive use of market-based measures in diversification studies in finance was problematic because managers, in formulating diversification strategy, relied most heavily on accounting-based performance evaluations. Also, Bromiley (1986) argued that accounting performance measures were better in many cases than market-based measures because they were used more frequently by managers to make strategic decisions.

Perhaps the most compelling reason for using accounting-based measures relates to the theory itself. Barney (1988) argued that abnormal returns to the acquiring firm are possible if information concerning uniquely valuable synergistic cash flows is kept private within the acquiring firm. In cases where both asymmetric information and private synergy are involved, the market cannot be expected to react accurately to news concerning such an acquisition. Although differences are also public, where synergies are private, information concerning performance will be released over a longer time period as synergies are realized. The realization of synergies should be reflected in long-term accounting-based performance improvements. Meeks and Meeks (1981) recommended return on assets (ROA) as the preferred accounting-based measure in post-acquisition performance evaluation because it reflects less bias than return on equity.

For pre-acquisition years, income statements of both partners were combined prior to the calculation of ROA. Combining statements in the pre-acquisition period overcomes the bias toward attributing merger related success or failure to performance differences that would have existed even if a merger had not occurred (Hitt et al., in press). This is especially important because acquiring firms often seek targets with higher performance.²

Prior research on acquisitions has generally ignored the influence of industry effects on firm performance. This is surprising considering the evidence that industry variation affects the relationship between corporate strategy and performance (Dess, Ireland, & Hitt, 1990; Rumelt, 1982). In this study, weighted industry ROA was subtracted from firm ROA prior to use (Rumelt, 1982). Weighting in the pre-merger period was based on the sales of the acquiring and target firms and their dominant 2-digit industries, as identified by Standard and Poor's. For post-merger data, weighting was conducted in a similar fashion, based on sales data

²Although pooling versus purchase approaches to accounting for acquired firm assets may affect the analysis (Ravenscraft & Scherer, 1987), most of the merged firms in this analysis were completed in a period when the purchase approach was required. Therefore, this issue was unlikely to have affected the results.

from the year immediately preceding merger. Similar tests were conducted using a 3-digit level of industry precision.

No less than 3 and no more than 5 years of data were used to calculate pre- and post-merger average performance. Although it is understood that some of the effects associated with synergy may not be fully realized within 5 years, adding years would have increased the probability of noncontrollable influences (e.g., other strategic actions by the firm). Moreover, each additional required year resulted in the elimination of many recent acquisitions due to insufficient data. Five years represented a tradeoff between these factors. Data were excluded during the year of the acquisition because of differences in the way acquired firm figures are reported. Performance (industry adjusted ROA) before the acquisition was used as a control variable.

Table 1 presents the intercorrelations matrix of the variables used in this study.

Results

Multiple regression analysis was used to test the competing hypotheses. The results (see Table 2) show that the differences in capital intensity, administrative intensity, interest intensity, and R&D intensity between the acquiring and target firms were positively related to firm performance following the acquisition. Thus, performance in the merged firm was higher when differences in resource allocations (capital asset expenditures, administrative expenses, interest, and R&D) between the acquiring and target firms were greater. These results support hypothesis H2.

To insure the strength and appropriateness of the interpretation of these results, we completed additional analyses that sought to determine if the findings hold for both related and unrelated acquisitions. For this study, acquiring and target firms were considered related if they both participated in the same dominant 2-digit industry prior to merger (Stewart et al., 1984). Unrelated acquisitions included firms from different 2-digit industry groups. Approximately 40% of the acquisitions were classified as related. The results of these analyses are shown in Table 3. For related acquisitions, differences in capital intensity, administrative intensity, and interest intensity between the acquiring and target firms were positively related to post-acquisition performance. No relationship between R&D intensity differences and merged-firm performance for related acquisitions was found.

For unrelated acquisitions, there was no relationship between capital intensity differences or interest intensity differences with merged-firm performance. How-

Table 1
Intercorrelation Matrix of all Variables

	1	2	3	4	5	6
1. Cap. Intensity Diff.	—					
2. Admin. Intensity Diff.	.160**	—				
3. Debt Intensity Diff.	.272**	.272**	—			
4. R&D Intensity Diff.	.095	.357**	.070	—		
5. Mean Adj. ROA Before	.325**	.179**	.306**	.125	—	
6. Mean Adj. ROA After	.235**	.213**	.199**	.192**	.410**	—

* $p < .05$. ** $p < .01$.

Table 2
Multiple Regression of Differences
in Resource Allocations Between Acquiring and Target
Firms on Post Acquisition Performance^a

Dependent Variable: Mean Adjusted ROA ^b				
Independent Variables	Coefficients	<i>t</i>	Model <i>R</i> ²	Model <i>F</i>
Capital Intensity Diff. Mean Adj. ROA Before	.093 .749	3.02** 8.17**	.183	49.1**
Admin. Intensity Diff. Mean Adj. ROA Before	.318 .724	3.27** 7.34**	.165	38.77**
Interest Intensity Diff. Mean Adj. ROA Before	.317 .769	2.38* 8.29**	.175	45.28**
R&D Intensity Diff. Mean Adj. ROA Before	1.350 .585	2.35* 3.31**	.178	24.6**

^aThese models use 2-digit industry level controls. However, similar results were obtained in the models using 3-digit industry level control variables. ^bThe dependent variable is the mean ROA for 5 years after the acquisition adjusted for industry ROA.

* $p < .05$. ** $p < .01$.

ever, differences in R&D intensity and administrative intensity between the acquiring and target firms were positively related to post-acquisition performance. Thus, these results support the competing hypothesis that uniquely valuable synergies may be created when differences in resource allocations exist.

Additional tests were conducted using various independent variable transformations and a different assumption concerning industry level. The models that made use of the 3-digit industry controls were essentially the same as the 2-digit control models. The logarithmic, reciprocal, and square transformations of the difference score variables resulted in models that were not as accurate in predicting post-merger performance. However, the square root transformations were found to be even better predictors of performance than the linear functions reported herein. Within the range of values observed for the difference score variables, this finding means that the first increment of difference was more valuable in terms of performance than additional increments. This relationship continued until it basically leveled off. These statistics were interpreted similarly to the linear function statistic; that is, they offered support for hypothesis H2.

Discussion

The results clearly support the hypothesis (H2) that differences in resource allocations between acquiring and target firms create value for merged firms in post-acquisition time periods. These results may support Barney's (1988) notion that when private and unique or inimitable resource flows exist between acquiring and target firms, greater value is created. As argued above, it is expected that this is more likely to be the case when differences are present than when the acquiring and acquired firms have similar resource allocation patterns. Of course, this observation will require more research because differences in resource allocation patterns were used as proxies for unique synergy in this study.

Table 3
Multiple Regression of Differences in
Resource Allocation on Performance for Related and Unrelated Acquisitions

Dependent Variable: Mean Adjusted ROA				
Independent Variables	Coefficients	<i>t</i>	Model <i>R</i> ²	Model <i>F</i>
<i>Related Acquisitions</i>				
Capital Intensity Difference	.342	4.24*		
Mean Adjusted ROA Before	.704	4.68**	.206	23.73**
Admin. Intensity Diff.	.446	2.36*		
Mean Adj. ROA Before	.741	4.47**	.152	14.43**
Interest Intensity Diff.	3.246	6.17**		
Mean Adj. ROA Before	.475	3.10**	.280	34.68**
R&D Intensity Difference	.848	.85		
Mean Adjusted ROA Before	.673	1.35	.037	1.38
<i>Unrelated Acquisitions</i>				
Capital Intensity Difference	.032	1.16		
Mean Adjusted ROA Before	.786	7.58**	.234	38.47**
Admin. Intensity Diff.	.246	2.60**		
Mean Adj. ROA Before	.661	5.93**	.194	27.56**
Interest Intensity Diff.	.082	.77		
Mean Adj. ROA Before	.807	7.95**	.230	36.57**
R&D Intensity Difference	1.771	2.66**		
Mean Adjusted ROA Before	.570	3.72**	.176	12.85**

* $p < .05$. ** $p < .01$.

Although supportive of the notion that differences in resource allocations between acquiring and target firms may create synergy, the results for related and unrelated acquisitions suggested somewhat different patterns by acquisition type. Differences in capital intensity, administrative intensity, and interest intensity contributed to greater firm value in related acquisitions whereas differences in administrative intensity and R&D intensity led to higher post-acquisition performance in unrelated acquisitions. The only common variable is administrative intensity.

In related acquisitions, synergy may be created through unique vertical integration arrangements such as in the example of the food processing and packaging manufacturing firms. Furthermore, the differences in debt costs may allow the acquiring firm to use cash from a target firm to reduce such costs and increase investments in process and product R&D. On the other hand, unrelated firms in a mature industry (low R&D intensity) may acquire a firm in a growth industry (possibly high R&D intensity). In both cases, differences in administrative intensity may create synergy by facilitating appropriate integration and managing to create maximum synergy (e.g., exploit strengths, distinctive competencies of both firms).

Stewart et al. (1984) and MacDonald (1985) found that acquiring firms seek targets with similar R&D intensity patterns. However, for example, the Stewart et al. study used a "limited" sample of only 35 mergers to support this hypothesis. The data collected for the present study provided an opportunity to further test their hypothesis with a much larger sample and additional variables. Correlation anal-

yses were conducted between each of the intensity variables in the acquiring and target companies for the year just prior to merger. The resulting correlation coefficients between acquiring and target firms were .32 for capital intensity, .47 for administrative intensity, .25 for interest intensity, and .64 for R&D intensity. All of these coefficients were statistically significant ($p < .01$).

Because these relationships would be expected to exist due to industry commonality, a second set of tests was conducted for the mergers involving firms from different 2-digit industries. This is the same technique Stewart et al. (1984) used to produce their sample. Although the resulting coefficients are not quite as strong as they were in the whole sample tests, they all remain statistically significant and positive except interest intensity. These results provide strong support for the findings of Stewart et al. (1984) that acquiring firms seek targets with similar resource allocation patterns. Prevailing theory would suggest that these firms are seeking synergy; more importantly, however, the results of the present study imply that they may reveal their position by pursuing targets with similar resource patterns, possibly resulting in a competitive auction and poor performance. Acquiring firms may find better results by seeking unique or complementary synergy that is difficult to imitate.

Future Research

Because results for traditional related and unrelated strategy groupings regarding performance have not been strong, the present study suggests that it may be useful to orient future research more to specific resources and resource patterns on which merger partners may capitalize. For example, unique and complementary synergy may be found by the merging of different administrative capabilities. Merging dissimilar administrative orientations and capabilities may result in an increase in the number of alternatives that are considered when dealing with complex managerial tasks. Furthermore, methods used to analyze alternatives can become more sophisticated. An acquiring firm may have a strength in one administrative area where the target firm has a weakness or vice versa. Additionally, these skills may be transferred from one firm to the other following the merger. In this way, the different skills may be complementary in the process of integration (similar to Porter's, 1987, suggestion of skill transference to achieve synergy). Thus, the combination of dissimilar operationalizations of administrative tasks may result in synergies that cannot be either understood or imitated easily.

Orientations to debt range from a desire to be virtually debt-free to an objective of deriving maximum benefits from leverage (Donaldson, 1961; Modigliani & Miller, 1958). Merging an acquiring and target firm, in which the allocations of resources to cover debt costs are dissimilar, may result in synergies produced by complementarity. For example, the cash flow generated from one firm's historically conservative approach to the use of debt may allow a merged firm to reduce interest obligations or to aggressively pursue specific marketplace opportunities. In a different vein, combining the skills represented by dissimilar patterns of resource allocations to cover debt costs may yield possibilities for unique structuring of the merged firm's participation in both debt and equity markets. Although financial structure may appear to be imitable by other firms, combinations em-

phasizing differences may create unique characteristics that are difficult to imitate. Thus, financial structure may represent a set of resources where complementary combinations can be examined in future research.

The combination of firms in which different amounts of resources have been allocated to R&D may yield uniquely valuable synergies. For example, it is possible that resources have been allocated primarily to process-oriented R&D in one firm, whereas available resources have been concentrated on product-oriented R&D in the second party involved in a given acquisition. Results from the merger of the different capabilities may include an ability for the merged firm to be highly effective and efficient simultaneously. These desirable, simultaneous outcomes could be achieved through frequent introduction to the marketplace of innovative products that can be manufactured in a cost-efficient, but quality-conscious process. Such a capability may be difficult for competitors to imitate, assuming effective integration is accomplished. Examining mergers for successful R&D activity combinations may shed light on post-merger performance.

Also, Kay and Diamantopoulous (1987) suggested that because firms pursuing synergy often have asset-specific investments to realize synergy, several potential problems are created. For example, if technology is stable, a firm may increase its relatedness between business units. In doing so, it increases its risk of corporate failure because synergy leads to joint profitabilities such that the firm's response flexibility is constrained. Therefore, firms may seek companies in other industries (with different competencies and skills) to reduce the risk of failure and the costs associated with coordinating the linkages between and/or among related units (e.g., information processing) in order to create synergy (Jones & Hill, 1988; Porter, 1985). In the evaluation of a possible diversification action, expected future cash flows in the primary industry are likely rated relative to other industries that represent diversification opportunities (Gort, Grabowski, & McGuckin, 1985). If current average industry profitability is low and expected growth rates in profitability are uncertain relative to other industries, then the probability of acquisition increases in order to preserve current capital. Although this rationale does not address post-merger integration issues, it nonetheless warrants future investigation.

Summary and Conclusions

The dominant theme of past research has been that related acquisitions have the greatest probability of producing synergy and thereby enhanced value. This logic suggests that firms seeking synergy should acquire target firms with the greatest similarities. However, the empirical results have shown no consistent relationship between relatedness and firm value. At least part of the reason for the inconsistent findings is that it is difficult to achieve unique and private synergy with target firms that have similarities. These similarities are likely known and other firms with the same similarities may seek to acquire the same target, thereby creating an auction. The auction produces competitive bidding, driving up the price of the target such that the majority of the value to be gained from synergy goes to the target firm shareholders.

In contrast, the theoretical notions proposed herein and supported by our results suggest that differences in resource allocation patterns may provide unique and

valuable synergy (Barney, 1988). First, because of asymmetric information, potential competitive bidders may be unaware of potential synergies and therefore are less likely to create an auction and bid up the price. In these cases, acquiring firms may have more opportunity to extract value (e.g., not paid to target firm shareholders) from synergy achieved with the target firm. Second, we argue that different but complementary resource flows may be more likely to create unique and private synergy than similar resource flows. The results of our research support this notion. Specifically, the results provided no support for the competing hypothesis that similarities in resource allocations among acquiring and target firms create valuable synergy. In fact, only differences in resource allocations were found to have positive effects on post-acquisition performance.

If supported in future research, the results of our study would have significant implications for the theory and practice of acquisitions. For example, the results suggest that a focus on specific resources rather than strategy types (related versus unrelated) in mergers and acquisitions may be more important for performance. In fact, our study provides possible answers for the inconsistent results of past research focusing on the performance differences between related and unrelated acquisitions. Specifically, complementary resource flows between acquiring and target firms may produce performance-enhancing synergies in both related and unrelated acquisitions.

Also, our data show that executives largely seek synergy from similarities in resource flows from acquisitions. However, the research provides no support for their opportunity to gain value from such similarities (either because the value goes to target firm shareholders because the price is bid up in a competitive auction or they are unable to achieve unique synergy). Therefore, differences in resource flows between acquiring and target firms may be more likely to produce unique and private synergy. The results of this study, then, provide support for the concept of private and uniquely valuable synergy accruing from acquisitions (Barney, 1988). Based on Barney's (1988) theoretical arguments and these results, executives may use different criteria, from those used in the past, to evaluate potential target firms for acquisitions. However, the theoretical notions proposed herein are based on specific resources and resource-allocation patterns as opposed to specific strategy types.

This research, based on a large sample of acquisitions across a number of industries and with data covering a 20-year period, is the first empirical test of the competing hypotheses specified herein. However, the potential importance of these results requires further investigation. If supported in future studies, these results have significant implications for firms following an acquisitive growth strategy.

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