



## The Link between Resources and Type of Diversification: Theory and Evidence

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## THE LINK BETWEEN RESOURCES AND TYPE OF DIVERSIFICATION: THEORY AND EVIDENCE

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*In this paper we theoretically and empirically investigate the idea that firms diversify in part to utilize productive resources which are surplus to current operations. Knowledge of these resources allows us to make predictions about the direction of a firm's expansion. In particular, we suggest that excess physical resources, most knowledge-based resources, and external financial resources are associated with more related diversification, while internal financial resources are associated with more unrelated diversification.*

Perhaps the research question that has attracted the most attention in the strategic management discipline is the possible association between firm diversification and performance. While there are many studies which have supported Rumelt's (1974) original finding that related diversified firms perform better than those that are unrelated (Montgomery, 1979; Bettis, 1981; Rumelt, 1982; Palepu, 1985; Varadarajan, 1986; Varadarajan and Ramanujam, 1987; Jose, Nichols, and Stevens, 1986; Lubatkin and Rogers, 1989) there is a growing number that find the opposite (Michel and Shaked, 1984; Rajagopalan and Harrigan, 1986; Elgers and Clark, 1980; Chatterjee, 1986) or are indifferent (Lubatkin, 1987). This lack of consistent support for the relatedness hypothesis raises a question. Is unrelated diversification the better choice in specific instances, even though on average it seems to be inferior to related diversification? To illustrate, Montgomery (1979) found that related diversifiers operate within high-profit industries. This could be because the same firms are better at diversification strategy as well as industry selection, or it could be because some underlying factors allow them to enter these industries and make related diversification their best strategy. If it can be shown that, under specific situations, unrelated

diversification can also create value, then we will have taken the first step to explaining some of the apparent inconsistencies in the literature.

To the best of our knowledge there are no studies that have tried to answer this question.<sup>1</sup> It may well be that firms are indifferent to the type (related or unrelated) of diversification. However, if we can identify systematic factors that influence the type of markets entered, this will be an important finding. For example, the relatedness hypothesis would need to be modified if it can be shown that both related and unrelated diversification can be justified depending upon certain *ex-ante* factors specific to individual firms. This paper builds a theoretical foundation to identify systematic factors that influence the type of diversification, and empirically examines the validity of these factors to explain the type of diversification undertaken by a diverse group of firms between 1981 and 1985. This paper demonstrates that the resource profile of the

<sup>1</sup> Chatterjee and Wernerfelt (1988) do link resources to the type of entered market. However, they do not control for other factors that can affect the decision to enter certain types of markets, nor do they draw the link between the selection of type of market and performance. These are the major extensions made in this paper over the Chatterjee and Wernerfelt (1988) study.

firms before 1981 can partially explain the type of diversification the firms in the sample engaged in from 1981 to 1985. The paper also demonstrates that high-performing firms conform more closely to the theoretical predictions than do low-performing firms. The results have important implications for managing diversification and for research in the area of diversification.

## THEORETICAL FOUNDATIONS

This paper is not about why a firm diversifies, but rather the type of market that a firm chooses to enter. Once a firm decides to diversify, the type of market chosen for entry should be such that it provides the firm with a competitive advantage. Porter (1987) suggests that a firm can gain such competitive advantages if it has skills or resources that it can transfer into the new market. His suggestion is not new. Resources have long been recognized to be one of the key factors in explaining diversification (Penrose, 1959). Rumelt (1974) talks about 'core skills' which can be used in related markets. Pfeffer and Salancik (1978) and Burt (1983) view multi-market operations of diversified firms as a means of managing resource-dependent relationships. The same theme is echoed in the economics literature (Teecce, 1982; Gorecki, 1975; Caves, 1982; Lecraw, 1984). The empirical evidence also suggests an association between diversification and the diversifying firm's resource position. At the aggregate industry level both Lemelin (1982) and Carleton, Harris, and Stewart (1984) find that firms tend to diversify into industries which use resources similar to their own. Studies by Lecraw (1984) and Montgomery and Hariharan (1990) corroborate this at the individual firm level.

All these studies suggest there is a systematic relationship between the type of market a firm chooses to enter and its resource profile. To use this relationship in developing our hypotheses, we need to identify (a) a typology of resources which is generalizable across different firms, and, (b) the association between resources, type of markets, and the potential for value creation. If these can be identified, then we should be able to see systematic patterns across a cross-section of firms about the type of entered market. Put another way, a resource-based approach allows

us to adopt the perspective of the diversifying firm's managers. If our basic assumption is valid, then we would expect managers to deploy firm resources to markets they believe would lead to the most profits. Of course, resources may not be the only factors that can explain the type of entered market. The empirical tests shall attempt to control for the more important of these other factors.

### Hypotheses about type of entered markets.

While Rumelt (1974) originally classified diversification as either related or unrelated, most recent literature considers the issue a matter of degree which is continuously variable (Montgomery, 1982; Caves, Porter, Spence, and Scott, 1980; Montgomery and Wernerfelt, 1988). We will therefore follow the latter approach, and both theoretically and empirically think of degrees of relatedness which can vary continuously from horizontal to unrelated. So the phrase 'type of diversification' should be understood in this context.

The type of diversification that we would expect to result from a resource depends on its specificity within a particular industry (Montgomery and Wernerfelt, 1988; Gort, Grabowski, and McGuckin, 1985; Williamson, 1975; Gorecki, 1975). Clearly, if a resource can be used to produce only one product, it is not suitable for diversification. However, most resources can be used for more than one end-product. In the interest of brevity let us call this characteristic of resources 'flexibility.' If a firm owns resources which are fairly end-product-specific (inflexible), then such a firm would be constrained to diversify in a relatively related fashion; whereas if a firm possesses resources which are flexible (regarding end-products), it would have the option of either more or less related diversification. Following a substantial tradition in the literature (Teecce, 1982; Macdonald, 1984; Montgomery and Hariharan, 1990) we consider three classes of resources: (a) physical resources, (b) intangible assets, and (c) financial resources. The first two are fairly inflexible; therefore, they can be used only to enter closely related markets. Financial resources, being most flexible, are useful for any type of diversification. A testable hypothesis from the above arguments is: physical and intangible assets would lead to more related diversification, while

financial resources can lead to any type of diversification.

To complete the argument we need to consider the extent to which different resources can be leveraged. Some resources, such as physical and financial resources, can be used only to the point where they are physically exhausted. So the only excess capacity available for diversified expansion is the stock beyond the requirements of the current businesses. By contrast some intangible resources such as brand names can be repeatedly used with different products with little cost in the effectiveness of original operations. These intangible assets usually accrue to a firm over time, and reside in the human capital of the firm in the form of knowledge and expertise. A patented chemical formula is an extreme example of such a resource. Less extreme examples include innovative capability or marketing skills of research and marketing staffs (see Wernerfelt, 1989 for more details).

We now present the specific hypotheses to be considered with the supporting reasoning for each.

### **Physical resources**

Physical resources of a firm, such as plant and equipment, are characterized by fixed capacity. Also, they are usually useful in a few very similar industries (inflexible). So if excess physical capacity motivates diversification, it would be in industries closely related to those in which the capacity is being used. Barton (1988) and Bettis (1981) have shown that capital expenditures are associated with related diversification. Firms which have excess capacity of such resources are unlikely to use it for diversification far from their core businesses.

*H1: Excess physical capacity will lead to related diversification.*

### **Intangible assets**

Intangible assets include brand names or innovative capability. Unlike physical assets, intangible assets tend to have 'softer' capacity constraints. A brand name can be applied to several products with little or no adverse effects on existing applications. Similarly, a strong marketing team or innovative research department can success-

fully market or innovate new products in many different markets without affecting the original businesses.

Intangible assets are also relatively inflexible and, therefore, can be used to most advantage in related industries. This expectation has also been suggested by others. Bettis (1981) suggests that related firms perform better because these (intangible) assets 'open up the possibility for differentiation and segmentation' (p. 381) and achieve high performance 'by early entry into (related) industries susceptible to entry barriers and then exploiting a "core skill" . . . to erect such barriers' (p. 390). Hill and Snell (1988) also suggest that in high research-intensive industries the best interest of stockholders would be served by limited and related diversification. Empirical evidence supports this expectation. There is evidence that firms operating in advertising- or research-intensive industries diversify into industries having high research or advertising intensity (Montgomery and Hariharan, 1990; Carleton, Harris, and Stewart, 1984; Lecraw, 1984; and Lemelin, 1982) which are related to their core markets (Bettis, 1981; Caves, Porter, Spence, and Scott, 1980). Taken together these studies suggest the testable hypothesis that intangible assets are used to enter related markets where they are most likely to generate a competitive advantage. In sum, we expect high levels of intangible assets to encourage related diversification.

*H2: Presence of intangible assets will lead to related diversification.*

### **Financial resources**

Financial resources in general are the most flexible of all resources because they can be used to buy all other types of productive resources. To arrive at hypotheses about how financial resources will be used we will break them up into two classes. The first class, internal funds, consists of liquidity at hand and unused debt capacity to borrow at normal rates. The second class, external funds, consists of new equity and possibly high-risk debts (such as junk bonds). Several theories suggest that lower levels of internal funds (relative to external funds) will lead to lower levels of unrelated diversification and vice-versa.

If unrelated diversification is truly unprofitable then the only reason managers would pursue such diversification is to increase the size of the firm and the manager's power as predicted by agency theory. Under this scenario, Jensen's (1986) 'free cash flow' hypothesis suggests that only firms with low leverage can pursue such unprofitable unrelated diversification. Firms with high leverage by necessity will have to go to the capital market for funds when 'the markets have an opportunity to evaluate the company, its management, and its proposed projects' (Jensen, 1986: 324). Since unrelated diversification is thought to be risky by the capital market (Montgomery and Singh, 1984; Rajagopalan and Harrigan, 1986; Lubatkin and O'Neill, 1987; Barton, 1988) external funds will not generally be available for unrelated projects. In other words, if agency behavior is widespread we would expect firms with low leverage pursuing unrelated diversification.

What if, by and large, managers do try to maximize shareholder wealth (i.e. agency theory is not the prevalent predictor for management behavior)? The only reason then a manager would undertake a relatively unrelated diversification is if the manager is *convinced* that if (s)he can invest in the project then *ex-post* it will increase shareholder wealth. However, given the capital market's reluctance with unrelated diversification the manager is faced with a situation where the information about the project is either unknown to the capital market or is not acceptable *ex-ante*. Myers and Majluf (1984) suggest that under this difference in information managers would utilize internal funds to fund such projects. Further, since related moves are looked at more favorably, external funds will be reserved for more related diversification.<sup>2</sup>

Both of the two theoretical perspectives lead us to expect that relatively more unrelated diversification will be associated with internal funds and relatively more related diversification will be associated with external funds, which leads to the following hypotheses.

<sup>2</sup> While both arguments lead to the same behavioral predictions (the type of entered market), the performance implications are totally opposite. Under the 'free cash flow' scenario the unrelated moves will not increase profitability *ex-post*, while under the Myers and Majluf scenario it will. This point is discussed in detail when the findings are interpreted in the discussion section.

*H3A: Availability of internal funds or unused debt capacity will favor more unrelated diversification.*

*H3B: Availability of equity capital will favor more related diversification.*

The theoretical predictions are summarized in Figure 1.

### Hypotheses about performance

Our theory is developed according to the basic assumption that firms undertake strategic moves with the expectation of improved performance. We do not claim that any one type of diversification will lead to higher performance, but it is the proper application of resources that will improve performance. Thus we would expect that high-performing firms will use intangible and physical assets to enter more related markets. We also allow for the possibility that managers may be able to identify profitable opportunities in unrelated markets. If our theory is descriptive of profit-maximizing behavior, the firms which follow the predictions more closely should perform better.

*H4: Firms which have higher performance, ex-post, will conform better to our model.*

### Controls

While the resources of a firm may provide a systematic explanation of the type of market decision there are other factors which may affect the type of entered market. The factors chosen have typically been found to influence diversification. To account for any possible systematic influences these factors are used as control variables.

### Risk

One problem with empirical verification of our model lies with our basic assumption that managers act to benefit stockholders and not their own utility (agency theory). If indeed managers are trying to increase their own utility in a relatively large proportion of the firms studied, then diversification may be pursued to build empires or reduce personal risk. For example, Hill and Snell (1988: 580–581) suggest

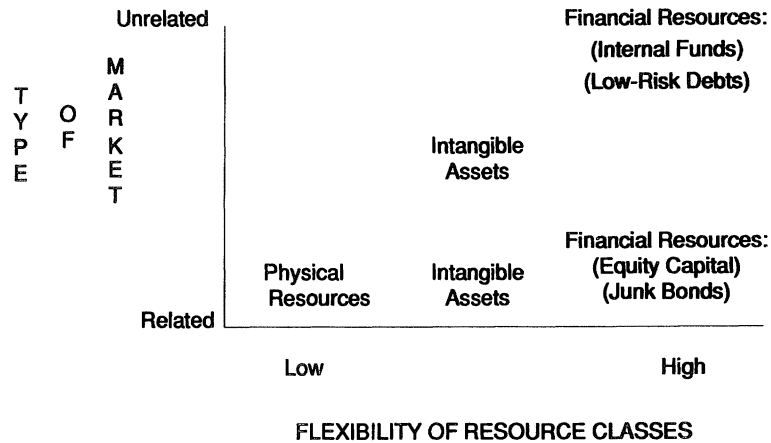


Figure 1. The relationship between the flexibility of resources and the type of market.

that in a high-risk/high-return environment of research-intensive industries, risk-averse managers may choose diversification (agency behavior) while the best interest of the stockholders will be served by limited and related diversification (our H2). Clearly, if agency behavior prevails we should not find support for our hypothesis and, therefore, needs to be controlled for. Since agency behavior is likely to surface when the risk of bankruptcy (and personal loss for the managers) is high (Amihud and Lev, 1981), we use the initial level of risk to control for agency costs.<sup>3</sup>

### Size

While the resource-based approach does not allow us to make a prediction about the direction of association between size and the type of diversification, large initial size of the firm may be associated with unrelated diversification and, therefore, should be controlled for. Size is used as a control variable in practically all multivariate studies of this type.

<sup>3</sup> Some authors have tried to capture agency problems by looking at stock concentration (Hill and Snell, 1988). However, typically the dispersion in stock concentration is low (Hill and Snell, 1988: 587) and even then there are other factors such as compensation schemes that can reduce agency costs. Risk is a much more direct measure and has inherently more variation than stock concentration, making it more suitable for multivariate tests.

### Capital intensity

Both Barton (1988) and Bettis (1981) have found an association between capital intensity and related diversification. We will therefore control for the initial level of capital intensity.

### Initial level of diversification

It is possible that the initial level of diversification may influence future diversification decisions. In a theoretical sense the initial level of diversification may indicate a level that the firm is comfortable with. Thus, for example, a firm with a related diversification status may be less inclined to undertake a relatively unrelated move. Empirically, when we try to measure a change, the initial level may be correlated with a future level.

## DATA AND MEASURES

We are interested in a quantifiable measure of the change in diversification profile for a sample of firms between 1981 and 1985, and explain this change as a function of the resources that the firm possessed in 1980, i.e. at the beginning of the period. The sample was compiled from two primary data sources, the *Trinet Establishment data base* and the *Compustat Industrial Annual data base*. The Trinet data contain employment, sales, and SIC code information for over 200,000 plants having more than 10 employees, which

are associated with more than 4000 parent firms. For these parent firms the Trinet data allow us to compute sales per four-digit SIC code in each of the two years considered. Of these parent firms 1203 are listed on the Compustat tapes. The sample reduced to 678 firms for which information on order backlogs, sales, capitalization and stock prices were available in the Compustat tapes, but data on advertising and research and development expense were only available for 167 firms. The need for stock return data from the CRSP tapes (to compute risk) further reduced the sample to 118. These 118 are listed in Compustat under 82 four-digit SIC codes covering 63 three-digit codes. The total assets per firm per SIC listing vary from 6 million dollars (computer disk and tape drives) to 12 billion dollars (motor vehicle and car bodies). Average assets per firm are roughly 900 million dollars.

#### Dependent variable

We compute a diversification index DW at two points in time—1981 and 1985:

$$DW = \sum_j d_{ih} p_{ij}$$

where  $d_{ih}$  equals distance of industry  $i$  from that of the firm's largest business ( $h$ ), and  $p_{ij}$  equals the fraction of the firm's sales which are in industry  $j$ . Following Caves, Porter, Spence, and Scott (1980: 199–200),  $d_{ih} = 0$  if  $i$  and  $h$  are in the same four-digit SIC code,  $d_{ih} = 1$  if they are in the same three-digit SIC code, and so on. DW measures diversification away from a core business (the largest business). Like all diversification measures of this type, it captures the reallocations of the firm's resources between different product markets, as well as entry into a new product market. Our dependent variable is

$$\text{DELTADW} = \text{DW}(85) - \text{DW}(81).$$

This variable thus measures a longitudinal change in the degree of diversification between two points in time. Note that large values of DELTADW indicate relatively unrelated diversification while small values indicate relatively related diversification. Several other continuous

measures of diversification, such as the entropy and the Herfindahl measures, have been used in the literature. As Caves *et al.* (1980: 201) have shown, most of these are highly correlated and lead to similar results.<sup>4</sup>

#### Physical resources

A direct measure of the firm's excess capacity at any point was not available. However, we noted that a firm would have a relatively lower backlog of orders during a period when it has excess capacity. An economy-wide increase in backlog indicates a very high level of capacity utilization.<sup>5</sup> The Compustat tapes provide data on backlog of orders for individual firms. Instead of using the absolute backlog in 1980, we use the ratio of the backlog of orders in 1980 to the 3-year moving average backlog going back to 1974. In dividing by the historical levels we partially correct for the industry and persistent firm-differences in average backlogs, and by taking a moving average we take some account of different growth rates. We use the name BKLOG for this variable. A firm with a lot of excess plant and equipment is likely to have a low level of backlog. Given our hypothesis, the coefficient on BKLOG is expected to be positive.

#### Intangible assets

Intangible resources such as marketing and innovative skills are usually measured by absolute levels of spending intensity. Following Bettis (1981) and Lecraw (1984), we used R&D to sales and advertising to sales. So we define:

<sup>4</sup> We estimated the model using several of the measures developed by Caves *et al.* (1980) and others (entropy). The results are virtually identical. We are presenting the findings with DELTADW because it is most likely to capture diversification away from a core business (which is more likely to contribute to the core skills). Note also that continuous measures such as DELTADW are different from the categorical measures used by Rumelt (1974). However, Montgomery (1982) demonstrated that continuous measures correlate very strongly with the categorical measures used by Rumelt (1974). So we feel that results obtained using these measures are robust. (It would of course be very difficult to construct a measure of change in diversification using a categorical measure.)

<sup>5</sup> The *Business Conditions Digest*, published by the Department of Commerce, uses both 'unfilled order of durable goods' and 'slower deliveries' of all goods as leading indicators along with capacity utilization.

RSL = the ratio of R&D expenses to sales in 1980.

ASL = the ratio of advertising expenses to sales in 1980.<sup>6</sup>

Following our theoretical arguments we expect the coefficients on RSL and ASL to be negative, since lower values of DELTADW indicate more related moves.

### Financial resources

#### *Internal funds and debt*

The standard measures for liquidity are usually used as a proxy for availability of internal capital (Palepu, 1986). These are the debt to market value ratio and the current ratio. We decided to use both of them:

DEMKT = ratio of long-term debt to market value in 1980.

CR = ratio of current asset to current liabilities in 1980.

Note that low values of DEMKT and high values of CR would also imply a low default risk. So these variables can be used to test for both availability of internal funds and/or 'low default risk' debt.<sup>7</sup>

According to H3A, we predict a negative sign on the coefficient on DEMKT and a positive sign is expected on the coefficient of CR.

#### *Equity capital*

To measure the firm's ability to raise external capital during the study period, we need to relate

<sup>6</sup> Note that it is important to concentrate on *absolute* levels of these expenditures as Bettis (1981) does. The average firm in an industry characterized by a high level of research intensity will have a better chance of exploiting diversification opportunities than an average firm in an industry characterized by a lower level of research intensity. While the R&D spending of both firms relative to the level in the industry is likely to be of similar magnitude, the absolute level of R&D spending will be higher for the firm in the more research-intensive industry.

<sup>7</sup> Practically speaking a firm with enough internal funds will not need to borrow. Hence it will almost always have a low leverage and low default risk. However, some firms may have been paying out their excess cash as dividends. In such a case a low leverage may not imply availability of internal funds. However, if the firm takes on debt it will still be of a low default risk because now the cash flow can be used to service the debt instead of dividends.

the average stock price in the study period to the 'normal' stock price for the firm. To be consistent with the other measures of resources we should use the stock price of the firm in 1980 and relate it to a 'normal' stock price. However, unlike leverage, stock prices are much more volatile and even a relatively temporary rise in stock prices provides opportunities to quickly raise external funds or even engage in a stock-swap merger. To take this characteristic of stock prices into account we take the average stock price in 1980–84 divided by that of the preceding period 1975–79. We use 1980–84 instead of 1981–85 on the judgement that it takes roughly a year to translate expenditures into sales.<sup>8</sup> If this ratio is high, the market is willing to supply capital below historical averages. Since the time periods are the same for all firms, this automatically corrects for the market variation in stock prices. So we define:

RLSTK = the ratio of average stock price, 1980–84, to average stock price, 1975–79.

According to H3B we expect that the coefficient on RLSTK to be negative.

### Performance measures

We use the average return on assets (ROA) over the period 1984–86 to measure *ex-post* performance. Since the diversification moves were observed between 1981 and 1985, we chose 1984 as the first point when the performance would show up. By starting measurement too early we would lose effects of late actions, and by starting too late we could lose effects of early actions. 1984 is a compromise. The mean ROA was used as the cut-off point for high and low performance.

### Control Measures

We control for the initial levels of risk, size, capital expenses, and diversification of the firms in the sample.

<sup>8</sup> The model was also estimated using only the average stock price in 1980 divided by the previous period. The results were very similar to the ones reported.



*Risk*

We use the variance of the firm's returns (TOTRISK) from 1978 to 1980 as a measure of the risk which managers may be tempted to reduce by unrelated diversification according to the agency theories. TOTRISK should, therefore, have a positive sign.

*Size*

We use the natural log of total assets in 1980 to measure the impact of size (Bettis, 1981).

$$\text{SIZE} = -1/\log(\text{total assets})$$

While there are no rigorous theories that predict the influence of size on the type of diversification, since large firms are typically unrelated conglomerates, size may be associated with unrelated diversification. SIZE should have a positive sign.

*Capital expenses*

We use net fixed assets per unit of total assets in 1980 to proxy for capital expenses (CAPEXP) as has been done by Barton (1988). CAPEXP is expected to be associated with future related diversification and should have a negative sign.

*Level of previous diversification*

The initial levels of diversification are given by DW81. We have no *a priori* expectations of the sign of this variable.

Summarizing, we use OLS to estimate the following model:

$$\text{DELTADW} = \left\{ \begin{array}{l} \text{BKLOG}(+), \text{RSL}(-), \text{ASL}(-), \\ \text{RLSTK}(-), \text{DEMKT}(-), \text{CR}(+), \\ \text{TOTRISK}(+), \text{SIZE}(+), \\ \text{CAPEXP}(-), \text{DW81}(?) \end{array} \right\}$$

**RESULTS AND DISCUSSION**

The means and correlations of all the variables are presented in Table 1. Several findings stand out. First, the mean value of change in diversification profile (DELTADW) is positive,

implying that these firms, on the average, have moved to more diversified postures over the study period. Second, there is a positive correlation between excess capacity (BKLOG) and equity capital (RLSTK), suggesting that unexpected increases in demand influence stock prices.

**Full sample**

The results of the regression models for the full and the stratified sample are given in Table 2. The overall findings about the resource variables are supportive of the theory. All coefficients have the expected signs and, except those of BKLOG, CR and RLSTK, all are significant. The coefficients on RSL ( $p < 0.01$ ), ASL ( $p < 0.05$ ), CR ( $p < 0.1$ ) and DEMKT ( $p < 0.01$ ) have the predicted signs. The results suggest that firms which are research- and/or advertising-intensive have diversified in a more related fashion, while firms having short-term (CR) and long-term (DEMKT) liquidity have diversified relatively further from their core business. The only significant control variable is size.

**Stratified sample: high- and low-performing firms**

The sample of firms was divided into two depending on whether they were above or below the mean ROA and the models re-estimated on the subsamples. The results are also given in Table 2.

The results for the stratified samples show that the higher-performing firms clearly conform to our model better. The regressions are significant at better than 2 percent level for the high-performing firms while the regressions for the low-performing firms are not.<sup>9</sup> Further, all variables which were significant in the full sample are also significant for the high-performing firms except the measure of short-term liquidity (CR). CR is, however, significant and is associated with unrelated diversification in the low-performing sample as predicted by H3A. The only variables which are similar in all respects between the two

<sup>9</sup> A Chow test for the two groups of firms barely misses being significant. However, when risk is operationalized by systematic risk (see footnote 13) the Chow test is significant. The individual variables, however, are significantly different from each other in either case.

subsamples are research intensity (RSL) and long-term liquidity (DEMKT). Several coefficients have signs which are opposite between the high- and low-performing subsamples. The measure of risk (TOTRISK) is significant ( $p < 0.05$ ) but has a sign opposite to that predicted by agency theory in the high-performance sample while it supports agency theory in the low-performing sample. Capital intensity (CAPEXP) is associated with more related diversification in the high-performing sample while the reverse is found for the low-performing sample. Size is associated with more unrelated diversification in all the samples.

## DISCUSSION AND IMPLICATIONS

Overall, the findings provide some support for the resource-based theories of diversification. The findings also suggest that to understand the link between diversification and performance we need to consider the resource profile of the firm. We shall now discuss the impact of different categories of resources on the type of entered market.

### Intangible resources

In the words of Chandler,

The common denominator of structure and strategy has been the application of the enterprise's resources to market demand. . . . Of these resources, trained personnel with manufacturing, marketing, and engineering, scientific and managerial skills often become even more valuable than warehouses, plants, offices and other physical factors (1962: 383).

Our findings also suggest that the intangible and financial resources are the dominant factors in explaining the type of diversification a firm chooses, and confirm Bettis's (1981) conjecture that these assets provide a competitive advantage for entering related markets. These findings also shed some light on why some firms do not undertake related diversification even though it is almost universally considered superior. The requirement for intangible assets varies greatly from industry to industry. If a firm historically finds itself in an industry where it needs to develop these skills to compete, it probably has

a better chance of diversifying into related and usually profitable industries. Of the two intangible assets, research and advertising intensity, the former seems to have the stronger explanatory factor based on the level of significance and the magnitude of standardized estimates (not presented). This stronger explanatory power of research intensity has also been observed in other studies (Caves *et al.*, 1980). One explanation for this may have again been provided by Bettis (1981), who suggests that advertising skills may reside, in part, with the advertising agencies. These skills may therefore be less specific to the diversifying firm when compared with research intensity.

### Financial resources

One of the more interesting findings of the study is the association between long-term liquidity and more unrelated diversification. This finding lends empirical support for the new generation of finance theories that claim that the method of financing does matter when the capital market has different expectations than the managers of the firm. This finding confirms the results of the studies in strategic management that suggest that unrelated diversification is considered to be more risky by the capital market (see also the discussion on risk in the stratified sample, later). Anecdotal evidence reported in the business press also supports the findings. Philip Morris, Exxon, General Electric, and Raytheon have all used high internal cash flows to diversify into unrelated businesses. USX used its unused debt capacity to borrow and acquire Marathon Oil.

Note also that internal funds which are long-term in nature provide the most robust association with unrelated diversification. The measure of short-term liquidity (CR) is significant only at ( $p < 0.1$ ), which may indicate that short-term liquidity is not as relevant for long-term strategic moves.

Contrary to our expectations, availability of cheaper equity capital does not seem to be associated with related, or unrelated, diversification. It is possible that since equity capital is publicly valued, firms make sure that it is only used for (related or unrelated) diversification moves which are in line with capital market expectations. A second explanation may be that large *Fortune* 500 firms are reluctant to raise

Table 1. Means and correlation amongst the variables

Name	DELTADW	BKLOG	RSL	ASL	DEMKT	CR	RELSTK	SIZE	DW81	DW85	ROA	TOTRSK	CAPEXP
MEAN	0.129	1.010	0.024	0.022	0.528	2.518	2.392	1.724	2.020	2.149	0.143	0.013	0.320
STD	0.097	1.161	0.023	0.031	0.612	0.819	1.877	17.212	0.831	0.835	0.068	0.0119	0.131
N	162	162	162	162	162	162	162	148	162	162	148	118	148
DELTADW	1												
BKLOG	0.024	1											
RSL	-0.155 <sup>†</sup>	0.108	1										
ASL	-0.179 <sup>†</sup>	-0.131 <sup>*</sup>	0.113	1									
DEMKT	-0.133 <sup>*</sup>	-0.070	-0.389 <sup>‡</sup>	-0.163 <sup>†</sup>	1								
CR	0.160 <sup>†</sup>	0.046	0.064	0.084	-0.154 <sup>*</sup>	1							
RELSTK	-0.088	0.275 <sup>‡</sup>	0.307 <sup>‡</sup>	-0.101	-0.041	0.010	1						
SIZE	0.114	0.053	0.214 <sup>‡</sup>	-0.031	-0.064	0.015	0.015	1					
DW81	-0.011	-0.084	-0.183 <sup>†</sup>	-0.008	0.113	-0.125	-0.208 <sup>‡</sup>	-0.065	1				
DW85	0.105	-0.080	-0.199 <sup>†</sup>	-0.029	0.097	-0.106	-0.217 <sup>‡</sup>	0.077	0.993 <sup>‡</sup>	1			
ROA	0.153 <sup>*</sup>	-0.075	0.066	0.223 <sup>‡</sup>	-0.242 <sup>†</sup>	0.091	-0.020	0.048	0.056	0.073	1		
TOTRSK	-0.216 <sup>†</sup>	0.043	0.013	0.082	0.127	-0.103	0.054	0.023	-0.167 <sup>*</sup>	-0.193 <sup>†</sup>	0.110	1	
CAPEXP	0.041	0.059	-0.067	-0.125	-0.023	-0.286 <sup>‡</sup>	-0.089	0.001	0.061	0.065	0.233 <sup>‡</sup>	-0.123	1

\*Indicates significance at better than 10 percent.

†Indicates significance at better than 5 percent.

‡Indicates significance at better than 1 percent.

Table 2. Hierarchical regression explaining type of entered market by starting resource positions

Variables	Full sample			High performance			Low performance						
	Predicted sign	Beta	S-error	Adj. R <sup>2</sup>	Change in R <sup>2</sup>	Beta	S-error	Adj. R <sup>2</sup>	Change in R <sup>2</sup>	Beta	S-error	Adj. R <sup>2</sup>	Change in R <sup>2</sup>
CONSTANT	?	0.002*	0.061			0.269†	0.082			0.124	0.101		
SIZE	+	0.001†	0.000			0.001†	0.000			0.000	0.002		
TOTRISK	+	-0.668	0.458			-1.313†	0.549			0.827	0.888		
CAPEXP	-	-0.084	0.072			-0.132	0.116			0.156	0.099		
DW81	?	-0.013	0.012	0.046		0.001	0.017	0.102		-0.023	0.018	0.000	
BKLOG	+	-0.002	0.007			0.000	0.008			-0.013	0.025		
RSL	-	-1.524*	0.475			-1.452*	0.614			-2.300*	0.833		
ASL	-	-0.475*	0.256			-0.583†	0.331			-0.456	0.465		
DEMKT	-	-0.064*	0.019			-0.091*	0.035			-0.061†	0.027		
CR	+	0.016†	0.010			0.011	0.014			0.023‡	0.017		
RLSTK	-	-0.004	0.007	0.168	0.122*	-0.009	0.009	0.215	0.113*	-0.002	0.013	0.126	0.126*
				d.f. = 107				d.f. = 50				d.f. = 46	
				F-stat = 3.180*				F-stat = 2.644†				F-stat = 1.681	

\* indicates significance at better than 1%

† indicates significance at better than 5%

‡ indicates significance at better than 10%

equity capital since it invariably depresses the stock price and dilutes control (Smith, 1986).<sup>10</sup>

### Performance

Perhaps the most important finding of this study comes from the stratified samples of high- and low-performing firms. The lack of significance for the overall regression for the low-performance sample supports our expectation that the high-performance firms are the ones who are likely to use resources according to the theory developed in the paper. To obtain some more insights into the performance difference we now contrast the coefficients of the individual variables between the two samples.<sup>11</sup>

In both samples high research intensity was associated with more related diversification in a significant fashion, and availability of long-term liquidity was associated with more unrelated diversification also at a high level of significance. The association of research intensity and related diversification for both subsamples (and the full sample) may simply indicate innovative ability is not very flexible and, therefore, can only lead to more related diversification. The observed association between long-term liquidity (low leverage) and more unrelated diversification, however, suggests some reasons for the performance differences. Recall that one argument as to why firms should use internal funds for unrelated diversification is based on the idea that such moves in general are viewed unfavorably by the capital market. However, implicit in this argument is the assumption that the managers can identify more unrelated entries which will lead to superior performance and, in spite of the capital market's pessimism, is in the shareholder's best interest.

<sup>10</sup> There is some recent anecdotal evidence for this argument. Consider the following quote from a recent *Business Week* article (*Business Week* 7 November 1988: 146–148).

Take media giant Gannet Co. It hasn't tapped the equity market since it went public in 1967. The company has financed its tremendous growth with internally generated funds and debt. 'We borrow as cheaply as we can, and we pay it back rather rapidly . . . with equity you've always got it out there and you've got to cover it with earnings' (emphasis added) (p. 146).

<sup>11</sup> In the absence of a significant regression for the low-performing samples, the significance of individual coefficients should be used only for making qualitative inferences.

The other argument is based on the agency cost of free cash flow, which can lead to more unrelated diversification. For example, excess cash position/debt capacity may lead to diversified expansion to prevent takeovers and retain management control. Palepu (1986) found that high debt capacity invited takeover attempts. If this is true, then diversification is not undertaken in the interests of the stockholders, but to benefit incumbent management (agency behavior). Under agency behavior we would expect that the use of excess cash/debt capacity to enter more unrelated businesses will lead to inferior performance as management will not be particular about the cost or potential of the unrelated entry.<sup>12</sup>

An insight into which of the two explanations is affecting the results is obtained by noting the association between the level of initial risk and the type of markets entered. Recall that agency behavior would lead us to expect a positive association between high initial levels of risk and more unrelated diversification. In the full model the observed association is the reverse of that expected by agency behavior, and the coefficient is approaching significance. For the high-performance firms the observed association is also against that expected by agency behavior and the coefficient is highly significant. In contrast for the low-performing firms the positive association between initial levels of risk and unrelated diversification indicate the possible existence of agency behavior.<sup>13</sup> Thus when the managers were

<sup>12</sup> The notion of 'free cash flow' suggests that if managers have excess cash in their hands they may try to buy their security by diversifying into unrelated but profitable markets. However, typically entry costs of such moves are very high, and therefore do not increase the value of the firm. Thus Philip Morris's all-cash bid for Kraft led some shareholders to institute a proxy fight because they felt it was a defensive move to protect the management from the risk of the declining cigarette business, and they were paying too much to acquire Kraft.

<sup>13</sup> To check for the lack of support for the agency behavior, we re-estimated the model using an estimate of systematic risk instead of the total risk. There is evidence in the strategic management literature that related diversification can reduce the systematic risk of a firm. Also systematic risk is the relevant risk that shareholders would like to see reduced because they can not diversify it away (see Lubatkin and O'Neill, 1987; Salter and Weinhold, 1979). We found that higher initial level of systematic risk was associated with subsequent related diversification *only for the high-performing firms*, which is in accordance with the studies in the strategic management literature (Lubatkin and O'Neill, 1979; Barton, 1988; Montgomery and Singh, 1984). This makes intuitive sense, because if managers were maximizing their own utility according to agency theory then the performance of their

possibly acting in the interest of the stockholders, unrelated diversification *did* lead to improved performance. However, if the reason for more unrelated diversification is simply to reduce the overall riskiness of the firm then such diversification moves led to inferior performance.

Overall the performance subsamples suggest that performance is not a function of diversification strategy but the appropriateness of the diversification strategy given the resource profile of the firm. The findings from the performance subsamples also provide a possible explanation of why some studies of individual diversification moves find that more unrelated moves outperform more related moves. Our results are consistent with the view that managers can identify more unrelated diversification moves which lead to superior performance if they are not acting to protect their own jobs but to benefit the shareholders.

In contrast to the high-performing firms, the low-performing firms use short-term liquidity (CR) in long-term diversification moves. Since short-term funds should, in general, not be used for long-term moves this may have contributed to their inferior performances.

Finally, in none of the samples do we find any statistical support for the physical resource hypothesis. However, the sign of the two measures of physical resources—the level of backlog which is a proxy for excess capacity and capital expenditures which controls for a commitment to physical assets—both support the hypothesis for the high-performance subsample, while they are the exact opposite for the low performing firms.<sup>14</sup>

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<sup>13</sup> Continued.

firms is likely to suffer. Systematic risk was not a significant explanatory factor in the low-performing models. The association of TOTRISK and related diversification for the high-performance firms is, therefore, most likely driven by the correlation between total risk and systematic risk. Also the model with systematic risk in general provided even better support for the theory than the model with total risk presented in the paper. For example, capital intensity, while supportive of the predictions in the high-performance models presented in Table 3 is not quite significant. However, when used with systematic risk capital intensity becomes significant. These results are available from the authors.

<sup>14</sup> The coefficient of capital expenditure does become significant for the high-performance firms when the model is re-estimated with systematic risk in place of total risk (see footnote 13).

### Relationship with literature

It is interesting to compare our findings with studies that have investigated the association between resources and diversity status at a point in time. Diversity status of a firm at a point in time is a product of earlier diversification moves. If indeed, as we find in this paper, exhaustible resources such as internal funds (high debt capacity) are repeatedly used to enter unrelated markets, then over time, such firms will not have any debt capacity left. The resource profile of a firm which has reached unrelated diversity status will therefore show a higher leverage (low debt capacity) than a firm with related diversify status. Several studies have observed this (Barton, 1988; Hoskisson and Hitt, 1988). On the other hand, if intangible assets (which are less exhaustible) are the primary resources used in related moves, the resource profile of a firm after repeated diversification would substantially be the same. This implication is supported by the cross-sectional studies of Bettis (1981), Carleton, Harris, and Stewart (1984), Lecraw (1984), and others.<sup>15</sup>

### Limitations and directions for future research

The finding of this study will have to be tempered with the possibility that we may have left out factors which could have a bearing on the type of entered markets. We have not tried to control for growth of the entered market, organization structure, culture, the extent of stock ownership, compensation schemes, or the nature of managerial expertise. Doubtless some of these factors would influence the type of entered market in individual cases. Whether these are systematic or random factors can only be verified by future studies. However, in none of the models presented was omitted variables a problem.

The findings allow us to suggest several managerial and research implications. While the overall model is exploratory, the findings suggest that firms contemplating related moves need to take stock of their intangible assets before undertaking such moves. Further, the findings indicate that unrelated diversification can also

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<sup>15</sup> We have replicated the Bettis (1981) and Barton (1988) results using a more updated sample with Rumelt's categories. Their findings are supported. These results and sample are available from the authors.

lead to a higher performance and managers should not pass up a project just because it happens to be in an unrelated market. The findings also provide guidelines for incumbent managers in attractive industries for identifying potential entrants (and future competitors) based on their resource profiles. Unrelated entrants are likely to be firms with a lot of free cash flow. If the incumbent firms are in industries characterized by strong marketing and/or research and development skills, related entrants can come from similar industries.

This study also has several implications for future research. The resource-based approach probably needs more investigation, since it builds on research which seems to be mutually consistent. The association between liquidity and unrelated diversification suggests that difference in expectations between the capital market and the firm can have strategic implications. This is a new direction of research which extends beyond diversification strategy. Future research using similar interdisciplinary methodology may yield important insights into a possible association between private expectations of firms and competitive advantages (Porter, 1985, 1987). Finally, the study sheds some light on the inconsistent findings about the performances of more or less related moves. If the findings of this study can be validated, then the inconsistency has a natural explanation. Both more or less related moves can lead to value creation contingent on the resource profile of the diversifying firm. Future research, for example, can directly test if unrelated diversification by owner-controlled firms leads to superior performance over management-controlled firms. Future research also needs to explore if related moves in some instances are more difficult to implement.

## CONCLUSION

We have tried to establish a direct association between the pattern of diversification and the underlying resources of a firm. The results show good support for the theory. Our findings are that, on the average, there is a strong association between intangible assets and more related diversification. There was no association between ability to raise equity capital and the type of entered market. We also found that higher-

performing firms supported the model better than lower-performing firms. There is no question that the type of diversification is affected by factors outside our model. Further, it is impossible to discard alternative explanations for some of our findings. Future research should be directed at weighing the relative merits of the alternate explanations. On the other hand the resource-based theory does seem to explain the data fairly well. The profit potential of any firm depends on the resources it can control, and by looking at diversification as a way to leverage these resources, we point to how the type of diversification can lead to value creation.

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