

# The Relationship Between the Effectiveness of Risk Diversification and Corporate Performance

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## Abstract

*This research examines the relationship between corporate risk diversification and financial performance. Prior research is extended by the use of a risk-adjusted performance measure typically used in the finance literature and a market-based measure of risk diversification. The analysis also uses a larger sample size than prior work, and controls for both firm size and ownership differences. The results support the hypothesis of a significant relationship between corporate risk diversification and performance. These findings are relevant for managers evaluating diversification strategies, for shareholders selecting appropriate firms for investment, and for researchers seeking to explain performance differences.*

## Introduction

The proliferation of corporate diversification activities over the past few decades has prompted strategic management scholars to examine the effect of diversification on a firm's financial performance.<sup>1</sup> Strategic management scholars allow that the underlying purpose of diversification is to enhance shareholder value. "Conceptually, shareholder value is not enhanced by diversification unless the performance of the group of businesses operating under the corporate umbrella is superior to what their performance would be as independent, stand-alone units (Thompson and Strickland, 1990, p. 166)." Traditional financial theory advises against diversification at the corporate level since investors have the opportunity to diversify within their individual portfolios more quickly and at less cost. However firms continue to expand both inside and outside their core businesses despite the fact that without some kind of strategic fit diversification adds little, if anything, to the competitive strength of the individual business units.

This paper empirically examines the relationship between corporate risk diversification and financial performance by drawing from both the finance and the management literature. It extends previous research through the use of an enhanced risk-adjusted performance measure, a market-based measure of the effect of risk diversification, a larger sample size, and by control-

ling for both firm size (Banz, 1981; Reinganum, 1981) and ownership structure differences (Oswald and Jahera, 1991). Hence, the findings from this research provide a contribution to the literature by focusing on the recognized value to the stockholders of corporate diversification. The intent is not to focus on the means of diversification but rather the ultimate effect as measured by investors in the marketplace.

## Previous Research

Hoskisson and Hitt (1990) provided an extensive review and critique of the theoretical perspectives concerning the diversification issue. Rather than repeat their multidisciplinary work, a summary of some of the relevant research from the finance and strategic management literature is presented in Table 1. Most of the studies presented use Rumelt's classification methodology which is based on the proportion of a firm's revenue attributable to nine business-related diversification schemes.<sup>2</sup> However, the literature has used a variety of measures of diversification and also of performance. Consequently, the effect of diversification on firm performance is difficult, at best, to assess.

An early study by Weston and Mansinghka (1971) utilized the extent of growth from external sources and the degree of diversification from external mergers and

**Table 1. Summary of Previous Research**

STUDY	SAMPLE	DIVERSIFICATION MEASURE	PERFORMANCE MEASURE	RESULTS
Weston & Mansinghka (1971)	63	Growth from external sources and degree of diversification from external mergers and acquisitions	Return on total assets Return on equity	+
Christensen & Montgomery (1981)	128	Rumelt's categories	Sales growth rate, EPS growth rate, ROA, Risk-adjusted return, ROE	+
Montgomery (1985)	128	Rumelt's categories	Return on invested capital	-
Nathanson & Cassano (1982)	206	Product diversity Market diversity	Return on capital	-
Rumelt (1984)	100	Rumelt's categories	Return on invested capital	-
Michel & Shaked (1984)	51	Rumelt's categories	Sharpe measure, Treynor measure, Jensen measure	+
Bettis & Hall (1982)	90	Rumelt's categories	Return on assets	+
Montgomery & Singh (1984)	98	Rumelt's categories	Sales growth rate, EPS growth rate, ROA, ROE, Risk-adjusted return	+
Bettis & Mahajan (1985)	80	Rumelt's categories	Return on assets Risk	0
Palepu (1985)	30	Jacuemin-Berry entropy measure, product count measures and Rumelt's categories	Return on sales	0
Grant, Jammine, & Thomas (1988)	230	Rumelt's categories, Index of product diversity, and Index of Multinational diversity	Return on net assets	+
Varadarajan (1986)	223	SIC 2-digit and 4-digit codes, broad spectrum diversity and mean narrow spectrum diversity	Sales growth rate, EPS growth rate, ROA, ROE, Return on total capital	+
Varadarajan & Ramanujam (1987)	223	SIC 2-digit and 4-digit codes, broad spectrum diversity and mean narrow spectrum diversity	Return on equity Return on capital Sales growth rate EPS growth rate	+
Amit & Livnat (1988a)	250	Accounting-based measures	Market-based returns Accounting ratios	+
Amit & Livnat (1988b)	250	Accounting-based measures	Accounting ratios	+

- + Found a statistically significant positive relationship between diversification and performance  
0 Found no statistically significant relationship between diversification and performance  
- Found a statistically significant negative relationship between diversification and performance

acquisitions as measures of diversification, and return on total assets and return on equity as performance measures. The authors concluded that conglomerate firms outperformed non-diversified firms on growth measures. The authors' suggested that the most appropriate test of the earnings performance of a conglomerate firm is the ability of the firm to achieve at least average earnings performance.

Christensen and Montgomery (1981) suggested that market structure variables influence firm performance and diversification strategy, and they drew similar conclusions to Weston and Mansinghka. In particular, Christensen and Montgomery noted that defensive diversification is influenced by the relationship between market power and structure and diversification strategy. Therefore, the firms most likely to diversify are those in markets which constrain the firm's growth or profitability. Sales growth rate, earnings per share growth rate, return on invested capital, return on assets, return on equity, and risk-adjusted return are the performance measures used in their study.

Montgomery (1985) concentrated on specific market power, measuring performance by return on invested capital. Market power is defined as the ability of a firm to influence the price, quality, and nature of the product in the marketplace (Shepherd, 1970). The results indicated that highly diversified firms have lower market shares and exist in markets with lower average levels of profitability and lower concentration levels than less diversified firms. Likewise, Nathanson and Cassano (1982) and Rumelt (1984), using return on investment as the measure of performance, found that increasing diversity is negatively correlated with profitability.

Michel and Shaked (1984) examine the degree to which a firm's operating components are related and considered market measures of performance rather than accounting measures. Their results did reveal statistically superior performance for firms that diversified in unrelated areas. However, data constraints related to the measure of diversification limited the sample to only 51 firms.

Bettis and Hall (1982) used return on assets and risk as performance measures in analyzing related-constrained, related-linked, and unrelated firms. Similar to Michel and Shaked (1984), their results showed that related diversification strategies were not superior to unrelated diversification, nor did unrelated diversification result in lower levels of accounting risk than related diversification. The latter finding is somewhat surprising since reducing risk would seem to be a prime motivating factor in pursuing unrelated diversification. The study did reveal a positive correlation between return and risk for firms with unrelated diversification strategies.

Montgomery and Singh (1984) used return on equity as the performance measure. They found that beta, a measure of systematic (market) risk, approximated the risk of the market for single businesses and related diversifiers. The beta for unrelated diversifiers was actually higher than that of the market portfolio. Capital structure and market power of unrelated diversifiers were viewed as the reason for this result.

Using a variety of measures of diversification against return on sales, Palepu (1985) found that highly diversified firms do not have higher profitability than firms with low diversification, nor do firms with high related diversification have greater profitability than firms with unrelated diversification. However, Palepu concluded that related diversification strategies will more likely lead to economic gain since the profitability growth rate of highly related diversified firms is greater than the rate of highly unrelated diversified firms.

Grant, Jammine, and Thomas (1988) used a combination of Rumelt's categories of diversification with an index of product diversity and an index of multinational diversity against return on net assets in their study of British firms. Diversity was found to be positively associated with profitability. The differences in profitability between firm categories, however, appeared to be due more to differences in the overall index of diversity than to the nature of the relationship between firms' businesses.

In a departure from previous measures of diversification, Varadarajan (1986) and Varadarajan and Ramanujam (1987) used Standard Industrial Classification (SIC) 2-digit and 4-digit codes to measure diversification from an industrial economics standpoint in terms of broad spectrum diversity and mean narrow spectrum diversity. Sales growth rate, earnings per share growth rate, return on equity, and return on total capital were the measures of performance. Firms with greater depth in diversity were found to financially outperform those firms with greater breadth in their diversification strategies.

Amit and Livnat (1988), using both accounting and market based risk measures, found that low return-low risk firms are usually unrelated diversifiers as would be expected. Their empirical sample included 269 firms with four alternative measures of diversification being used. A further conclusion was that firms are not able to increase return and reduce risk at the same time. Again, this is expected given the positive relationship between risk and return.

Using still another measure of value, Tobin's  $q$ , Amit and Wernerfelt (1990) examined business risk reduction and the effect on firm value. Using a sample of 151 firms and a set of value creation control variables, a regression analysis revealed a negative and significant

relationship between diversification and firm value.

### Measurement of Firm Diversification

While there has obviously been a great deal of research on diversification and its effects, earlier studies have tended to rely on measures of diversification based on some degree of subjective assignment. That is, such measures generally consider either product diversification or market diversification but not both simultaneously. In essence, the more traditional measures of diversification focus upon the means of the firm's diversification rather than the ultimate effect of diversification, reduction in risk. In an attempt to capture the effect of risk diversification strategies, Barnea and Logue (1973) developed a stock market-based measure of diversification that essentially correlates the firm's stock with the stock market as a whole. Jones (1991, p. 726) discusses the use of such a measure. This measure offers advantages over traditional methods in that it captures the joint and interrelated effects of physical product and market diversification at least to the extent realized by investors in the market. The authors suggest that this stock-market measure of diversification be used in place of physical diversification measures in attempts to ascertain a firm's exposure to risk. That is, the more closely the firm's stock returns are correlated with the market as a whole, the greater the degree of risk diversification. By definition, the stock market as a whole represents a diversified portfolio of individual firms. A truly diversified firm can at best be a comparable investment to the market as a whole unless there is something unique about the firm in question. Consequently, the correlation between the individual firm's stock performance and the market's performance may be viewed as a measure of the effectiveness of risk diversification strategies. It should be noted that this measure differs from beta, the measure of systematic risk, in that beta may be affected by other factors such as the degree of financial leverage. The correlation measure has also been used by Jahera, Lloyd, and Page (1987a and 1987b) in their work on firm diversification. Jahera et. al. (1987a) utilize portfolio performance measures found in the finance literature to evaluate the effectiveness of internal diversification for a sample of 1439 firms. They control for both size differences and systematic risk differences and conclude that a relationship does exist between size and diversification effects. They further conclude that well diversified firms have stronger performance. Jahera et. al. (1987b), using a regression approach, found no consistent relationship between diversification and size. No consideration of ownership structure is given in either of these two works despite the implications of agency relationships for firm diversification.

While theoretical definitions of risk vary across disciplines (March and Shapira, 1987), and may even

differ from the way some managers define risk (Shapira, 1986), our research will relate firm financial performance to the effectiveness of firm risk diversification strategies using the Barnea and Logue measure as previously discussed.

### Theoretical Framework

Traditional finance theory has held that product or market diversification at the firm level adds no value to the firm, given that individual investors can, more easily and at less cost than for a firm, diversify their own investment portfolios. However, firms have and continue to engage in diversification activities. The primary reason hypothesized to explain such behavior is found in the context of agency theory as espoused by Jensen and Meckling (1976). Essentially, agency theory suggests that shareholders may suffer costs when outside managers are employed to represent their interests. That is, the degree to which managers use their abilities to maximize shareholders' wealth is dependent on the percentage of equity ownership that managers have in the firm (Jensen & Meckling, 1976; Eisenhardt, 1989; Walking & Long, 1984). The greater the financial attachment of the manager, the more likely the manager is to make decisions which will result in higher value to shareholders. Agency theory further contends that managers, acting as agents for owners, may pursue strategies and goals to meet their own utility rather than that of the owners. For example, given concerns about job security, a manager might decide to diversify the business into unrelated areas in order to reduce the risk and smooth cash flows (Hoskisson and Turk, 1990; Amihud and Lev, 1981). Traditional finance theory does not argue that such diversification does not reduce risk, but rather that such risk reduction is of no added value to shareholders. Support for this argument is given by Amihud and Kamin (1979) who found that manager-controlled firms are more likely to maximize sales rather than profits, have a lower profit rate but less variability, engage in activities to smooth income, and engage in conglomerate mergers. Despite the theory, there has been evidence from the cited literature that diversification does affect firm performance.

However, as Hoskisson and Hitt (1990) indicated, there are numerous reasons given by management for diversification strategies. For example, the firm may have underutilized asset capacity or may simply be responding to incentives other than risk reduction. Despite the stated reasons, diversification, by smoothing the firm's earnings, does lead to a reduction in risk.

### Research Hypothesis

The hypothesis to be tested in this paper is that corporate risk diversification, using security market information, and financial performance are related,

*ceteris paribus*. That is, if risk diversification at the corporate level is truly of value, contrary to the financial theory, such added value should be recognized and captured in the stock price. In this context, one would expect a positive relationship between performance and diversification. Alternatively, if such diversification by the firm merely duplicates what the individual owners can do, then one would expect no significant relationship. Based on mixed results of earlier research (see Hoskisson and Hitt, 1990) the direction of the relationship is unclear. The results of our research, by using a market-based measure of diversification effects, will provide additional evidence as to the investors' view of the value of diversification strategies.

### Operational Definitions

#### *Diversification*

A review of the literature (Hoskisson and Hitt, 1990; Ramanujam and Varadarajan, 1989), and as shown in Table 1, reveals that there is a great deal of variation in how diversification is conceptualized, defined and measured. Much of the research conducted to date has addressed diversification in terms of the extent to which firms classified in one industry produce goods classified in another industry. For the purpose of this paper, diversification is defined in terms of a stock market based approach developed by Barnea and Logue (1973). That is, diversification will be measured as a correlation between the firm's stock returns and the market return (See Jones (1991) for discussion of this measure). As was previously mentioned, the market represents complete diversification. Thus, the greater the correlation of the firm's stock returns with the market, the greater the effectiveness of the risk diversification of the firm.

#### *Performance*

The question of which performance measures are the "best" measure of organizational performance is dependent of the discipline studying the issue (see Table 2). The finance literature utilizes excess stock returns as the appropriate risk-adjusted measure of performance. The concept of an excess return simply means that the firm's return is compared to the return for a control portfolio of firms of similar risk. The Center for Research in Security Prices (CRSP) Excess Returns File provides such a measure. Basically, the CRSP methodology follows the technique of Scholes and Williams (1977). All firms are placed into one of ten control portfolios based on their prior year's beta value. Beta is the measure of systematic risk of the particular firm. The excess return for each individual firm is found by subtracting the firm's actual return from its respective control portfolio return. Firms with similar risk should have similar returns. Any deviation is defined as an excess return and may be either positive or negative. The expected value of the excess returns for a portfolio or group of firms is zero. For each firm in the sample, monthly excess returns are taken from the CRSP data file. The question in this paper is whether diversification structure affects performance in such a manner that actual returns will be significantly different from those expected by the Capital Asset Pricing Model.

#### *Control Variables*

Ownership and size are used as control variables in this study, since both ownership and size affect firm performance (Banz, 1981; Reinganum, M.R.; Oswald & Jahera, in press). Ownership is measured in terms of stockholdings of both officers and directors. Lloyd,

Table 2. Performance Measures most often used by Research Disciplines\*

Research Area	Typical Performance Measures
Accounting	Current Ratio, Quick Ratio, Net Working Capital, Cash Flow
Economics	Profits, Sales Growth
Marketing	Sales Growth, Market Share, Brand Awareness
Organizational Behavior	Employee Satisfaction, Turnover Rates, Span of Control
Production	Cost/Unit, Inventory Levels, Quality, Reject Rates, Output/Direct Man-hours
Strategic Management	Sales Growth, Net Profits, Return on Investment
Finance	Excess Stock Returns, Earnings per Share, Net Income, Return on Investment

\* adapted from Hofer (1983)

Jahera, and Goldstein (1986); Kim, Lee, and Francis (1988), and Oswald and Jahera (1991) also measure ownership in this way. Size is measured in terms of the total market value of the firm's equity at the beginning of the performance period.

### *Sample*

The sample of firms is taken from the intersection of firms on the Compustat Industrial Data File (accounting variables), the Value Line Investment Survey (insider holdings), and the CRSP data files (excess stock returns). The sample period covers 1982 to 1987 inclusively and includes 645 firms listed on the New York Stock Exchange and the American Stock Exchange.

Prior to the merging of the data sets, the sample was ranked according to the degree of internal diversification as measured by the correlation between the firms excess returns and the New York Stock Exchange value-weighted index for the time period 1982 to 1987 inclusive. The higher the correlation, the greater the degree of internal diversification. The sample was then divided into five equal groups. Group 0, represents firms with the least amount of internal diversification, while Group 4 includes firms with the greatest amount of internal diversification. In a like manner, firms are ranked based on degree of inside ownership. Firms are also placed into five equal groups based on size.

To complete the analysis, two five by five matrices of portfolios are formed. One matrix is based on the five way ranking by amount of internal diversification and the five way ranking of percent of stock held by insiders. The other matrix is based on the five way ranking by amount of internal diversification and the five way ranking of size. Because the rankings of the groups is done prior to merging the data sets, the resulting matrices do not contain equal sample sizes in each cell.

The use of these contingency tables allows for the greatest differences between the portfolios of firms in the cells. Again, one would expect the excess returns for a portfolio to be zero.

## **Empirical Findings**

### *Diversification and Ownership Portfolio Results*

Table 3 presents the relevant data for each of the twenty-five resulting portfolios based on diversification and inside ownership. Also included are some basic accounting ratios for each of the portfolios. Each of the portfolios are formed by match-merging the degree of internal diversification with the ownership ranking. For example, cell 0,0 represents those firms with the smallest degree of diversification and the smallest proportion of inside ownership. The columns hold diversification constant while increasing proportions of inside owner-

ship. Conversely, the rows hold ownership constant while increasing the degree of diversification. Each individual cell contains the following information in the order presented: correlation of firm's stock to the market, average percent of insider ownership, average returns on assets, average return on equity, portfolio average monthly excess returns, and the number of firms in the cell.

From Table 3, excess returns are shown to increase as diversification increases while ROA and ROE decrease. In other words, the market appears to be placing a value on firm diversification not captured in the accounting measures of performance. Comparing columns 0 and 4, the least and most diversified firms, reveals the differences in performance. A look at the extremes, that is cell (0,0), the least diversified firms with the lowest inside ownership, and cell (4,4), the most diversified firms with the highest inside ownership, offers some interesting insight. The excess returns are -0.32 and 0.58 respectively. The closely held diversified firms outperformed the others by a sizable margin. One reason may be that in such firms, the insiders have a great proportion of their personal wealth invested in the firm and consequently, the firm diversification proxies their individual diversification.

To statistically analyze the relationship between diversification, ownership, and performance, analysis of variance (ANOVA) is applied to the mean monthly portfolio returns for each portfolio in the matrix. The results are presented in Table 4. The ANOVA yields a statistically significant relationship for the main effect of diversification ( $F = 3.18$ ) and for the main effect of ownership ( $F = 3.87$ ); however, there was no statistically significant relationship for the interaction effect of diversification with ownership. The results suggest that both degree of diversification and degree of inside ownership affect firm performance, as measured by the firm's excess returns.

### *Diversification and Size Portfolio Results*

Table 5 presents the relevant data for the twenty-five resulting portfolios based on diversification and size. As with Table 3, each portfolio is formed by match-merging the diversification rankings with the size rankings. The columns hold diversification constant while increasing firm size, and the rows hold size constant while varying the firm amount of diversification.

From Table 5, one observes that excess returns do increase as diversification increases while holding size constant. For instance, the excess return for firms in row 0, the smallest firms, ranges from -0.11 to +0.19. Likewise, ROA and ROE shows substantial increases as one moves across the size row. However, except for the smallest firms, the accounting measures of performance

**Table 3. Relevant Data for the Ownership/Diversification Portfolios\***

Inside Ownership	0	1	Diversification 2	3	4
0	0.04	0.17	0.23	0.31	0.43
	1.25	1.31	1.12	1.46	1.39
	6.76	6.47	3.48	1.99	1.92
	13.58	13.06	4.86	5.26	3.84
	-0.32	-0.25	-0.15	-0.05	-0.07
	38	33	24	24	18
1	0.05	0.16	0.23	0.31	0.44
	4.85	4.89	4.87	5.10	5.24
	6.79	2.40	5.30	6.52	3.16
	12.32	4.03	10.63	12.25	5.84
	-0.68	-0.76	-0.07	-0.34	-0.42
	31	28	30	12	23
2	0.04	0.15	0.24	0.31	0.43
	11.13	11.57	11.93	11.89	13.52
	7.21	3.85	6.74	6.50	2.32
	12.98	6.53	13.11	12.06	4.80
	-0.81	-0.54	-0.02	-0.25	-0.31
	26	22	22	34	21
3	0.04	0.16	0.24	0.31	0.42
	23.11	23.42	23.30	22.00	24.21
	7.36	4.92	6.10	3.93	4.28
	12.13	10.24	6.33	8.17	7.02
	-0.71	-0.46	-0.15	-0.69	-0.14
	18	23	22	28	37
4	0.06	0.15	0.24	0.30	0.41
	40.69	45.68	42.99	44.07	45.12
	6.80	5.37	6.62	7.61	5.37
	14.70	10.05	11.88	13.22	9.81
	-0.41	-0.19	0.06	-0.11	0.58
	16	23	31	31	30

\* The information in each cell is ordered as: correlation of firm's stock to the market, average percent of stock held by insiders, average return on assets, average return on equity, portfolio average monthly excess returns, number of firms in portfolio.

Table 4. Results of Analysis of Variance

Source	df	ANOVA SS	F
Main effect of Diversification	4	0.00601	3.18**
Main effect of Ownership	4	0.00732	3.87*
Interaction effect of Diversification with Ownership	16	0.00449	0.59

· p < .005  
 .. p < .01  
 \*\*\* p < .05

generally decrease with diversification. To statistically analyze the relationship between diversification, size, and performance, ANOVA is applied to the mean monthly portfolio returns, as previously discussed. As shown in Table 6, both the main effect of size and the main effect of diversification were found to be statistically significant ( $F = 3.97$  and  $2.48$ , respectively) explanatory variables of firm performance.

#### Discussion and Conclusions

This study empirically examines the relationship between the effectiveness of corporate risk diversification, as measured by the correlation between the firm's stock and the market, and performance, as measured by excess stock returns. The results support the hypothesis of a significant positive relationship between diversification and performance, even after controlling for ownership and size. The findings in this research are based on a methodology using excess returns as a performance measure while controlling for agency effects (ownership structure) and also size. Earlier studies have considered some of these effects but not simultaneously. Consistent with several earlier studies, these results do indicate positive effects of firm risk diversification from the stock investors' point of view. The implication from this effort is that the result of diversification, risk reduction is valued, not necessarily the particular means by which this result is achieved. That is, while controlling for others factors affecting performance, the more diversified firms, in terms of risk reduction effects, displayed stronger performance.

The result of this study provide an extension to the body of literature on diversification strategies by focusing on the effect as measured by the securities market rather than the particular means such as product and/or market diversification. Additionally, the use of stock return data for performance assessment captures the value recognized by shareholders. Finally, the results support a value added even when controlling for differences in both ownership structure and size. These

results have important implications for managers, investors as well as researchers. For managers, the implication is that diversification activities may indeed lead to higher performance on a risk-adjusted basis. Obviously, investors would find such a result attractive if they can earn a higher return for some given level of risk.

#### Suggestions for Future Research

The analysis of firm diversification must be conducted in the context of the body of literature, both theoretical and empirical. While the many studies have utilized a wide variety of diversification measures and performance measures, overall, the evidence has tended to support the value enhancement from diversification. This is in contradiction to the theory from financial economics. Clearly, there are many areas for future research into the effects of firm diversification. For instance, it is unlikely that the several diversification measures found in prior research are capturing the same effects. Until researchers agree upon some valid measure of diversification as well as firm performance, the findings on diversification benefits will likely be mixed. ■

#### \*\*\*Footnotes\*\*\*

1. According to Rumelt (1972, 1982), the proportion of revenue from diversified activities has increased significantly over time. Porter (1987) likewise reported continuing increases in diversification activity. However, the late 1980s were characterized by a movement away from diversification and toward divestiture (See Hoskisson and Turk (1990)).
2. Rumelt (1974) developed the most widely used diversification classification mechanism. He classified firms into nine strategic diversification categories using specialization, related and vertical ratios. The specialization ratio is defined as the proportion of a firm's revenues that can be attributed to its largest single business; the related ratio is the proportion of a firm's revenues attributable to its



**Table 5. Relevant Data for the Size/Diversification Portfolios\***

Size	0	1	Diversification 2	3	4
0	42.60	51.79	44.83	54.00	38.19
	0.09	0.16	0.24	0.30	0.43
	-0.53	1.16	0.51	4.55	1.81
	-6.47	1.00	10.00	8.75	2.94
	-0.11	-0.31	0.10	-0.56	0.19
	8	26	26	30	38
1	146.58	137.25	136.07	126.03	133.52
	0.09	0.17	0.24	0.31	0.44
	6.28	4.36	4.23	3.46	5.11
	12.91	9.53	0.43	6.81	8.23
	-0.56	-0.16	-0.55	-0.65	-0.30
	11	22	29	35	31
2	330.10	301.81	305.31	303.31	306.57
	0.05	0.16	0.24	0.31	0.42
	6.26	2.66	6.54	7.15	4.38
	11.54	3.30	12.86	12.82	8.70
	-0.67	-0.77	-0.36	0.11	-0.23
	19	20	35	30	27
3	762.38	819.81	851.07	707.36	764.31
	0.05	0.16	0.23	0.30	0.41
	7.98	6.61	4.98	6.01	3.00
	15.20	12.56	11.62	11.97	5.37
	-1.16	-0.05	-0.01	-0.27	-0.32
	35	33	19	25	17
4	4042.13	4988.06	2710.88	4427.66	2333.40
	0.04	0.15	0.23	0.31	0.42
	7.55	7.54	7.62	5.73	5.01
	14.44	16.01	15.00	11.69	10.42
	-0.24	0.04	0.09	0.21	0.33
	56	28	20	9	16

\* The information in each cell is ordererd as: average market value of firm's equity, correlation of firm's stock to market, average return on assets, average return on equity, portfolio average monthly excess returns, number of firm's in portfolio.

Table 6. Results of Analysis of Variance

Source	df	ANOVA SS	F
Main effect of Size	4	0.01021	3.97**
Main effect of Diversification	4	0.00638	2.48***
Interaction effect of Size with Diversification	16	0.00771	0.75

- p < .005
- · p < .01
- · · p < .05

largest group of related businesses; and the vertical ratio is the proportion of the firm's revenues that arise from all by-products, intermediate products, and end products of a vertically integrated sequence of processing activities. The nine categories are single business, dominant vertical, dominant constrained, dominant linked, dominant unrelated, related constrained, related linked, unrelated multi-business, and unrelated portfolio.

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