

DIVERSIFICATION AND FIRM PERFORMANCE: AN EMPIRICAL EVALUATION

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Abstract

Diversification is a strategic option that many managers use to improve their firms' performance. This interdisciplinary research attempts to verify whether firm level diversification has any impact on performance. The study finds that on average, diversified firms show better performance compared to undiversified firms on both risk and return dimensions. It also tests the robustness of these results by classifying firms by performance class. The results show that among the best performing class of firms, undiversified firms have higher returns, but these returns are accompanied by high variance. Whereas, highly diversified firms show lower returns, and much lower variance. Results further show that diversified firms perform better than undiversified firms on risk and return dimensions, in the low and average performance classes. The paper concludes that a dominant undiversified firm may perform better than a highly diversified firm in terms of return but its riskiness will be much greater. If managers of such firms opt for diversification, their returns will decrease, but their riskiness will reduce proportionately more than the reduction in their returns. In such firms, there will be a tradeoff between risk and return.

INTRODUCTION

Two seemingly irreconcilable facts motivate this study: one, diversification continues to be an important strategy for corporate growth; and two, while Management and Marketing disciplines favor related diversification, Finance makes a strong case against corporate diversification. With the help of a large sample, this interdisciplinary study tries to address this contradiction in the associative relationship between diversification and firm performance.

Diversification is a means by which a firm expands from its core business into other product markets (Aaker 1980, Andrews 1980, Berry 1975, Chandler 1962, Gluck 1985). Research shows corporate management to be actively engaged in diversifying activities. Rumelt (1986) found that by 1974 only 14 percent of the Fortune 500 firms operated as single businesses and 86 percent operated as diversified businesses. Many researchers note a rise in diversified firms (Datta, Rajagopalan and Rasheed 1991, Hoskisson and Hitt 1990). European corporate managers according to a survey, not only favor it but actively pursue diversification (Kerin, Mahajan and Varadarajan 1990). Firms spend considerable sums acquiring other firms or bet heavily on internal R&D to diversify away from their core product/markets. Of late U. S. firms are beginning to moderate their zeal for diversification and are consolidating around their core businesses. But this trend has not affected large Asian corporations which continue to remain highly diversified.

As in any economic activity there are costs and benefits associated with diversification, and ultimately, a firm's performance must depend on how managers achieve a balance between costs and benefits in each concrete case. Moreover, these benefits and costs may not fall equally on managers and investors. Management researchers argue that diversification prolongs the life of a firm. Researchers in finance argue diversification benefits managers because it buys them insurance, and shareholders usually bear all the costs of such insurance.

Diversification can improve debt capacity, reduce the chances of bankruptcy by going into new product/ markets (Higgins and Schall 1975, Lewellen 1971), and improve asset deployment and profitability (Teece 1982, Williamson 1975). Skills developed in one business transferred to other businesses, can increase labor and capital productivity. A diversified firm can transfer funds from a cash surplus unit to a cash deficit unit without taxes or transaction costs (Bhide 1993). Diversified firms pool unsystematic risk and reduce the variability of operating cash flow and enjoy

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comparative advantage in hiring because key employees may have a greater sense of job security (Bhide 1993). These are some of the major benefits of diversification strategy.

Diversification, firm size, and executive compensations are highly correlated, which may suggest that diversification provides benefits to managers that are unavailable to investors (Hoskisson and Hitt 1990), creating what economists call the agency problem (Fama 1980) and managers stand to lose if they become unemployed, either through poor firm performance or bankruptcy (Bhide 1993, Dutta, Rajagopalan and Rasheed 1991, Hoskisson and Hitt 1990). Diversification can also lead to the problem of moral hazard, the chance that people will alter behavior after entering into a contract-as in a conflict of interest by providing insurance for managers who have invested in firm specific skills, and have an interest in diversifying away a certain amount of firm specific risk and may look upon diversification as a form of compensation (Amihud and Lev 1981, Bhide 1993). Although it may be necessary for a firm to reduce firm specific risk to build relations with suppliers and employees, only top managers can decide what is the right amount of diversification as insurance (Bhide 1993). Diversification can be expensive (Jones and Hill 1988, Porter 1985) and place considerable stress on top management (McDougall and Round 1984). These are the costs of diversification.

In the final analysis, this situational argument regarding balancing costs and benefits can only explain the performance of individual firms but it cannot address the theoretical question about the veracity of diversification as a valid corporate strategy. Consequently, following the benefit-cost agreement, whether in general, diversification enhances firm performance becomes an empirical question. Further, recent reviews of the rather extensive literature do not find agreement about the direction of association between firm diversification and firm performance. This lack of a clear answer in the literature motivates the present study.

The paper is organized in four sections. The first section briefly reviews the empirical literature and presents the research hypotheses. Section two describes the research methodology and operationalizes the dependent and independent variables. Section three presents the results of the study. The concluding section discusses the results and summarizes the findings.

REVIEW OF EMPIRICAL LITERATURE AND HYPOTHESIS

The impact of diversification on firm performance is mixed. Three recent reviewers (Datta, Rajagopalan and Rasheed 1991, Hoskisson and Hitt 1990, Kerin, Mahajan and Varadarajan 1990), broadly conclude: (a) the empirical evidence is inconclusive; (b) models, perspectives and results differ based on the disciplinary perspective chosen by the researcher; and © the relationship between diversification and performance is complex and is affected by intervening and contingent variables such as related versus unrelated diversification, type of relatedness, the capability of top managers, industry structure, and the mode of diversification.

Some studies claim diversifying into related product-markets produces higher returns than diversifying into unrelated product-markets and less diversified firms perform better than highly diversified firms (Christensen and Montgomery 1981, Keats 1990, Michel and Shaked 1984, Rumelt 1974, 1982, 1986). Some claim that the economies in integrating operations and core skills obtained in related diversification outweigh the costs of internal capital markets and the smaller variances in sales revenues generated by unrelated diversification (see Datta, Rajagopalan & Rasheed 1991). While agreeing that related strategy is better than unrelated, Prahalad and Bettis (1986), clarify that it is the insight and the vision of the top managers in choosing the right strategy (how much and what kind of relatedness), rather than diversification per se, which is the key to successful diversification. Accordingly, it is not product-market diversity but the strategic logic that managers use that links firm diversification to performance; which implies that diversified firms without such logic may not perform as well. Markides and Williamson (1994) show that strategic relatedness is superior to market relatedness in predicting when related diversifiers outperform unrelated ones. Others however argue, it is not management conduct so much, but industry structure that governs firm performance (Christensen and Montgomery 1981, Montgomery 1985).

Besides diversification types and industry structure, researchers have also looked at the ways firms diversify. Simmonds (1990) examined the combined effects of breadth (related vs. unrelated) and mode (internal R & D versus Mergers & Acquisitions) and found that relatedly diversified firms are better performers than unrelatedly diversified firms, and R & D based product development is better than mergers and acquisition- led diversification (Simmonds 1990, Lamont and Anderson 1985). Among studies of acquisitions the results are mixed. Some report that related acquisitions are better performers than unrelated ones (Kusewitt 1985), or there is no real difference among them (Montgomery and Singh 1984).

Some studies on breadth and performance find relatedly diversified firms perform better than firms that are unrelatedly diversified (Rumelt 1974, 1982, 1986). Others show confounding effects in firm performance because of

diversification category and industry (Christiansen and Montgomery 1981, Montgomery 1985). Recent studies suggest service firms should not diversify (Normann 1984), whereas, Nayyar (1993), shows that in the service industry diversification based on information asymmetry is positively associated with performance, whereas diversification based on economies of scope is negatively associated with performance. A contradiction of Johnson and Thomas' (1987) confirmation of Rumelt's finding that the appropriateness of product diversity is judged by a balance between economies of scope and diseconomies of scale. It also appears there is a limit on how much a firm can diversify; if a firm goes beyond this point its market value suffers and reduction in diversification by refocusing is associated with value creation (Markides 1992).

Apart from the empirical evidence, the efficient market hypothesis (EMH) holds that competition among investors for information ensures that current prices of widely traded securities are the unbiased predictors of their future value, and that current prices represent the net present value of its future cash flow. Evidence supports the existence of weak, semi- and near-strong forms of market efficiency (Fama 1970). If this view of the market is true, then investors have the information necessary to construct portfolios of stocks to maximize their risk/return strategies for a given amount of resource. Consequently, a firm's management cannot do better for the investor by diversifying into different product markets and create a portfolio that will improve returns or better manage risk than investor's stock portfolio. Stockholders also do not pay a premium for diversified firms (Brealey and Myers 1996); the market does not value risk/return trade-off positively for unrelated diversification (Lubatkin and O'Neil 1987), and acquiring firms only earn normal returns (Lehn and Mitchell 1993), and not economic rents. Finally, corporate takeovers discipline managers who waste shareholder resources and bust-ups promote economic efficiency by reallocating assets to higher valued uses or more efficient uses (Jensen and Ruback 1983, Lehn and Mitchell 1993).

The review of empirical literature from Management/Marketing disciplines and the theoretical and empirical literature from Finance show that the relationship between diversification and performance is complex and is affected by intervening and contingent variables. Taken together, the evidence and arguments presented above seems to suggest that diversified firms (i.e. highly unrelatedly diversified firms) as a class, should perform less well than an optimal securities portfolio, and thus for our study we propose the following null hypothesis.

Our null hypothesis (H_0) is that: *Highly diversified firms should perform less well than moderately diversified and single product firms.*

There are numerous arguments and findings against the null hypothesis proposed above. In certain markets, an investor may face assets constraint in constructing a portfolio, restricting diversification opportunities (Levy 1978). Farrelly, and Reichenstein (1984) show that total risk rather than systematic risk alone, better explains the expertly assessed risk of stocks. Jahera, Lloyd and Page (1987), find well-diversified firms have higher returns regardless of size. DeBondt and Thaler (1985, 1987), argue that the market as a whole overreacts to major events. Prices shoot up on good economic news and decline sharply on bad news. According to Brown and Harlow (1988, 1993), investors hedge their bets and over react or under react to important news by pricing securities below their expected values. As uncertainties decrease, stock prices adjust upwards, regardless of the direction of the impact of the initial event. The post-event adjustment in prices tends to be greater in the case of bad news than in the case of good news. Haugen (1995) also casts doubts on the validity of the EMH. Finally, Fama and French (1992), changing their earlier stance, argue that the capital asset pricing model (CAPM) is incapable of describing the last fifty years of stock returns, and the beta is not an appropriate measure of risk. This implies that a stockholder may not be better positioned to diversify his portfolio of stocks as compared to a corporate manager as implied by the null hypothesis. On the basis of this discussion, we could argue that market inefficiency may not allow investors to optimally allocate their resources. It can put managers, especially good ones, in a more advantageous position to diversify their product market portfolios and thereby improve firm performance.

Thus, our alternate hypothesis (H_1) is: that diversified firms perform better in terms of return and risk measures compared to less diversified firms. Thus, on average, diversified firms as a class, should perform better than moderately diversified or single-product firms.

STUDY DESIGN

The availability of the Compustat database has made it possible to study a larger sample of firms over several years and approach the problem of diversification from a more macro perspective. The approach used in this study is akin to that of military historians who examine past battles and in the context of operational tactics conclude that combatants with greater force (material and manpower) tend to win more often. Those with insufficient force need

the advantage of mobility and surprise to neutralize superior force in order to win. These insights, based on outcomes of many battles, allow historians to disengage from contingencies and specificities of stewardship and terrain. This does not imply that situational specifics should be ignored in planning military campaigns. The finding only points out the general truth of certain tactics. Similarly, in the context of the conduct of business strategy, we could also first examine the performance of diversified firms without regard to specifics of strategy, like type, breadth, modality and industry, and figure out if in general, the average performance of diversified firms is better than that of undiversified firms. The diversification literature is unable to demonstrate that diversification type, breadth, modality, and industry have consistent and predictable impact on performance. We therefore treat these as situational contingencies and do not take them into account.

Most earlier studies of diversification use cross sectional data, small samples and single measures of performance. We on the other hand, examine a large sample of firms with data over a seven year period. We use about two thousand firms, and multiple performance measures. The starting point of our main study is 1984, the earliest data point for segment information available on the Compustat database. Specialization Ratio (revenue from a firm's largest segment divided by its total revenue) as the dependent variable measures the extent of diversification. Accounting and market returns, their variability, coefficient of variation, and the Sharpe Index are the independent performance variables. The study also tests the robustness of classification of firms based on SR ratios. For this part of the study, the data is available from 1981. It also tests the robustness of results based on the extent of performance and the degree of diversification.

MEASUREMENT OF CONCEPTS

Diversification is treated as the independent variable in this study. As a policy variable, managers can control the extent of diversification desired, and performance is the dependent variable. This section defines and operationalizes these concepts.

Diversification

This study uses Specialization Ratio (SR) to classify firms into three classes of diversification. Its logic reflects the importance of the firm's core product market to that of the rest of the firm (Rumelt, 1974, 1982; Shaikh & Varadarajan, 1984). After we started this work some researchers have argued that the entropy measure of diversification is probably a better one. We leave it to future research to test the robustness of SR versus other measures of diversification. Operationally, SR is a ratio of the firm's annual revenues from its largest discrete, product-market activity to its total revenues. In the diversification literature, SR has been one of the methods of choice for measuring diversification. It is easy to understand and calculate.

TABLE 1
Values of Specialization Ratios in Rumelt's and Our Classification Schemes

	SR Values in Rumelt's Scheme	SR Values in Our Scheme
Undiversified, Single Product Firms	$SR \geq 0.95$	$SR \geq 0.95$
Moderately Diversified Firms	$0.95 < SR \leq 0.7$	$0.95 < SR \leq 0.5$
Highly Diversified Firms	$SR < 0.7$	$SR < 0.5$

Table 1 compares the classification scheme proposed by Rumelt and the one used in this study. Rumelt (1974) was one of the first to systematically look at the problem of diversification. He classified firms into three groups-(1) single product firms with $SR \geq 0.95$; (2) moderately diversified firms with SR values between $0.95 < SR \leq 0.7$. This group includes dominant, relatedly diversified and unrelatedly diversified firms; (3) the highly diversified category of firms have $SR < 0.7$ and include conglomerates, relatedly-constrained and relatedly-linked firms. Rumelt calls a

firm moderately diversified if its sales from its dominant business lies between 95 percent and 70 percent of its total sales, and he calls a firm highly diversified if the sales from its dominant business is below the 70 percent mark.

Our study uses an alternate scheme. We keep the Single product category of the same size in terms of its SR value but enlarge the moderate and the highly diversified categories- single product firms ($SR \geq 0.95$), moderately diversified ($0.95 < SR \leq 0.5$), and highly diversified ($SR < 0.5$). In this new scheme the SR values of the moderate and the highly diversified categories are larger than those proposed by Rumelt. The rationale for the alternate scheme is as follows:

Financial economists and management researchers mean slightly different things when they refer to a diversified firm. To financial economists, a diversified firm is essentially a conglomerate with unrelated businesses in its portfolio. They do not consider related diversification as being diversified because, to them, these do not represent different product-market investments. Rumelt (1974), argues that relatedly diversified firms, with an SR ratio between 0.95 and 0.7, perform better than unrelatedly diversified firms with SR less than 0.7. To address the contradictory arguments advanced by researchers in finance and management disciplines, we enlarged the moderate and highly diversified categories with the new break for SR at 0.5 rather than at 0.7. An SR of 0.5 implies that only 50% of the firm's sales come from its largest segment, and all other segments in which the firm operates, contribute the remaining 50% of sales. This means that we are increasing the variance of the moderate group to include both the relatedly diversified and unrelatedly diversified firms; and adding (or in fact culling out) the highly diversified conglomerate firms with SR ratio 0.5 and below into a separate third group of highly diversified firms. This approach has several advantages.

If we succeed in rejecting the null hypothesis for both Rumelt's and the modified categorization schemes, then, not only are we in a stronger position to assert that diversified firms improve performance compared to undiversified or less diversified firms, but more importantly, make Rumelt's SR based approach robust because the results become invariant to categorization schemes. Finally, and methodologically, the stronger argument favoring our approach is that if we reject the null hypothesis, then the confidence in our result will be greater because the new categorization is biased in favor of the null and against the alternate hypothesis. But in order to use our approach to classification, we first try to show that performance of firms remain indifferent to classification breaks.

Performance

Management researchers prefer accounting variables as performance measures such as return on equity (ROE), return on investment (ROI), and return on assets (ROA), along with their variability as measures of risk. Earlier studies typically measure accounting rates of return. These include: (ROI), return on capital (ROC), return on assets (ROA) and return on sales (ROS). The idea behind these measures is perhaps to evaluate managerial performance-how well is a firm's management using the assets (as measured in dollars) to generate accounting returns per dollar of investment, assets or sales. The problems with these measures are well known. Accounting returns include depreciation and inventory costs and affect the accurate reporting of earnings. Asset values are also recorded historically. Since accounting conventions make these variables unreliable, financial economists prefer market returns or discounted cash flows as measures of performance. For the sake of consistency, we use two accounting measures: ROE and ROA; along with market return to measure performance.

Return on equity (ROE) is a frequently used variable in judging top management performance, and for making executive compensation decisions. We use ROE as a measure to judge performance and calculate the average return on equity (AROE) across all sampled firms and time periods, its standard deviation and also the coefficient of variation for each of the three diversification groups. ROE is defined as net income (income available to common stockholders) divided by stockholders equity. The coefficient of variation (CV) gives us the risk per unit of average return.

ROA is the most frequently used performance measure in previous studies. It is defined as net income (income available to common stockholders), divided by the book value of total assets. We also calculate the average return on assets (AROA) across all sampled firms and time periods calculate its standard deviation and also the coefficient of variation for each of the three diversification groups.

Market return (MKTRET), is the third dependent variable we use. MKTRET is computed for a calendar year by taking the difference between the current year's ending stock price, and the previous year's ending price, adding to it the dividends paid out for the year, and then dividing the result by the previous year's ending price. This study includes companies for which complete data to calculate the variances used is available on Compustat PC- Plus for the period 1984 through 1990. In addition, we calculate the average market return (AMKTRET) for each of the three groups, the standard deviation of AMKTRET, and the Sharpe Index (Sharpe, 1966), a commonly used risk-adjusted performance measure. It measures the risk premium earned per unit of risk exposure.

RESULTS AND DISCUSSION

As mentioned earlier, Table 1 presents comparison of breaks between Rumelt's classification and the modified version. Using the Compustat database we then classified 2637 firms using Rumelt's classification scheme for the years 1981-1990.

Table 2 presents the AROE and its standard deviation using Rumelt's classification. While we intended to calculate AROA and MKTRT for this data set we were unsuccessful because of the problem of missing data. The 1984 - 90 data set proved to be better and was used for the alternate classification scheme for all the three performance variables.

Using the same Compustat database, we classified 2188 firms in three groups: Single Product Firms ($SR > 0.95$), Moderately Diversified Firms ($0.5 \leq SR \leq 0.95$), and Highly Diversified Firms ($SR < 0.5$), for each of the seven years, from 1984 to 1990, for which complete segmental data was available. We kept only those firms in the sample that remained in the same SR category for the entire seven year period, and had all the data for computing the variables. After classification, we calculated each of the three performance variables: return on equity (ROE), return on assets (ROA), and market return (MKTRET), for each firm in each of the three groups, for each year from 1984 to 1990. We also calculated the average ROE (AROE), average ROA (AROA), and average MKTRET (AMKTRET), first by averaging across the seven years for each firm, and then by averaging across firms by pooling across the years, along with their standard deviation, and coefficient of variation. Tables 3, 4 and 5 present the results. The number of firms in each performance group varies slightly because we had to ensure that the data was available for all variables, for all the seven years.

Statistical Procedure

The test of the null hypothesis requires a test of equality of means of each classification group, and for each performance variable. While the study may indicate one way analysis of variance (ANOVA), it is not a robust test. The application of ANOVA requires that the data set meet three critical assumptions: first, the test is extremely sensitive to departures from normality; second, the assumption of homogeneity of variance is necessary; and third, the errors should be independent of group mean. While for our study the first and the third assumptions checked out, the second assumption regarding the homogeneity of variance failed. We carried out Hartley's test of equality of variance for each performance variable. This test confirmed that variance of the three groups is unequal for each performance variable. We faced the Behrens-Fisher problem or checking for equality of means when variances of the underlying population are unequal. Such situations indicate Cochran's approximation test for hypotheses testing (Berenson and Levine 1992). This test requires us to test the null hypothesis of equality of means, taken two at a time, and according to the test we must reject the null if the t (observed) exceeds t (critical) at chosen levels of significance. (Statistical information available from authors by request)

TABLE 2
Performance Based on Rumelt's SR Classification Scheme: ROE-1981-1990

	N	AROE	SD	CV
Undiversified Firms ($SR \geq 0.95$)	1663	3.8	277.9	73.13
Moderately Diversified ($.95 < SR \leq .7$)	371	2.3	181.2	78.78
Highly Diversified ($SR < .7$)	603	9.9	100.9	10.25

Results

Classification Methods: Comparison and a Test of Robustness

Table 1 compares the breaks in SR values. Table 2 reports the results using Rumelt's scheme with 1981-1990 data, and Table 3 reports the results using our scheme with 1984-1990 data. The first column in Table 2 shows the three categories of diversification based on SR values; N stands for the number of firms that remained in the same group for the period 1981-1990, and had performance data for the entire period under study; AROE stands for the average of the ROE calculated over N firms; SD stands for the standard deviation of AROA; and CV represents the coefficient of variation, given by the ratio of SD divided by the AROE, representing the risk per unit average return. Tables 3 through 5 follow the same layout for ROE, ROA and MKTRET.

TABLE 3
Performance As: Return On Equity (AROE)-1984-1990

	N	AROE	SD	CV
Undiversified	1844	-1.6	323.3	NA
Moderately Diversified	315	32.7	409.4	12.52
Highly Diversified	23	14.6	9.8	0.67

N= Sample Size, AROE= Average Return on Equity,
SD= Standard Deviation, CV= Coefficient of Variation

The highly diversified group in Table 2 has AROE of 9.9, SD equal to 100.9 and CV of 10.25; the moderate group has AROE of 2.3, SD equals 181.2 and CV equals 78.8. The Undiversified group AROE is 3.8, SD 277.9 and CV 73.1. The highly diversified group has the highest AROE, the lowest Standard Deviation and the lowest Coefficient of variation. The results are in the expected direction. The results follow the expected path with the exception that AROE of the moderate group is less than that of the undiversified group but the mean values are not far apart and the difference is statistically insignificant. The result for the undiversified and the highly diversified groups are as expected. The SD values are also in the expected direction. Compare these results with results obtained in Table 3.

Table 3 shows the relationship between the degree of diversification and group-wise performance measured by ROE. The sample consists of 1844 single product firms with SR greater or equal to 0.95. The average ROE of these firms over the seven year period is -1.6 percent, with a SD of 323.3.

The moderately diversified group with SR between 0.95 and 0.5, has 315 firms. The AROE of the group equals 32.7 percent and the SD equals 409.4. While the AROE of this group is clearly superior to that of single product firms, the group shows high ROE variability. Thus, the moderately diversified group shows a slightly improved risk-return profile.

The third group with SR values of less than 0.5, is the smallest, and includes only 23 firms. The average ROE of the group equals 14.6 or about half that of the second group, with SD of 9.8, which is much lower than the first and the second group. The CV is the lowest at 0.67, which is about 1/20 of the moderate group.

Table 3 shows that while highly diversified firms have lower risk than moderately diversified firms, moderately diversified firms have higher average ROE compared to highly diversified firms. It also shows that single product firms have lower risk than moderately diversified firms, but moderately diversified firms have much higher returns. When we combine the return and risk measures as given by the coefficient of variation CV, we do see consistent results, i.e., that highly diversified firms have better risk-return profile than moderately diversified firms; and moderately diversified firms perform better in risk-return terms when compared to single product firms.

We find that the Tables 2 and 3 show results in expected direction. The highly diversified groups have higher AROE and lower SD compared to the other two groups. This comparison of the two classification schemes shows sufficient consistency especially in the two extreme groups to strongly suggest that performance tends to be invariant to classification breaks. The comparison also demonstrates the validity of using the more pronounced classification scheme used in this study.

Performance as Return on Assets and its Variability

Table 4 shows the relationship between the degree of diversification and group-wise performance based on ROA. The sample consists of 1848 single product firms with SR greater or equal to 0.95. The AROA of these firms over the seven year period is - 1.9 percent, with a SD of 38.2.

TABLE 4
Performance As: Return On Assets (AROA)-1984-1990

	N	AROA	SD	CV
Undiversified	1848	-1.9	38.2	NA
Moderately Diversified	316	4.0	5.0	1.25
Highly Diversified	24	5.8	2.7	0.47

N= Sample Size, AROA= Average Return on Assets,
SD= Standard Deviation, CV= Coefficient of Variation

The moderately diversified group with SR between 0.95 and 0.5 has 316 firms. Its AROA equals 4 percent with a 5 percent SD. In absolute terms, the AROA of this group is higher than that of undiversified firms and has lower SD of 5.0 percent, as compared to 38.2 percent of the first group. The CV is positive at 1.25, which shows a much improved risk-return profile.

The third group of the highly diversified firms includes 24 firms, with AROA of 5.8 and SD of 2.7. These values are lower than the first and the second group. The CV of this group is high at 0.47, being 38 percent of the moderate group.

Statistical results in Table 2 show that as we move from undiversified group of firms to the highly diversified group of firms, the average return on assets increases, the variability of ROA as given by SD decreases, and CV or the risk per unit return decreases. Statistically, according to Table 4, the above results are significant at the 1% level. Based on these findings reject the null hypothesis.

Performance as Market Return

Table 5 reports group-wise market return performance. The sample consists of 1195 firms in the single product category, and 280 and 23 firms in the moderately and highly diversified groups. The sample for each group is smaller than it was for AROA and AROE because we eliminated firms that did not have complete information for the period under study.

The average market return AMKTRET of the undiversified group over the study period is 8.2 percent. The SD is 21.1, the risk per unit of return as measured by the CV is 2.57 and the Sharpe Index is 0.0421.

The moderately diversified group with SR between 0.95 and 0.5 has 280 firms. Their AMKTRET equals 13.2 percent and the SD equals 40.8 percent. Whereas, the average market return of this group is clearly superior to that of the single product firms, the group shows higher variability as compared to the first one. The CV, i.e., the risk per unit return also is higher at 3.08. The Sharpe Index of the moderate group is 0.1443, about three times higher than the first group, and is in the expected direction. The third group includes 23 firms. Its AMKTRET equals 16.3, with SD of 10.1, which is much lower than the first and the second group. The CV is 0.67, about a fourth of the first group. The Sharpe Index at 0.89 is about six times higher than that of moderately diversified firms.

Table 5 shows that the average market return for the highly diversified group is higher than the moderately diversified group, followed by the single product group. The variability of market returns of the highly diversified group is lower than firms in the single product group. Moderately diversified firms on average have a higher market return, but higher risk than single product firms. The Sharpe Index, the inverse of which gives us risk per unit return, and is a better risk-return measure, shows that the performance of highly diversified firms is much better than the moderately diversified ones, and performance of moderately diversified firms is better than single product firms.

TABLE 5
Performance As: Market Return (AMKTRET)-1984-1990

	N	AMKTRET	SD	CV	SI
Undiversified	1195	8.2	21.1	2.57	0.0421
Moderately Diversified	280	13.2	40.8	3.08	0.1443
Highly Diversified	23	16.3	10.1	0.67	0.8900

N= Sample Size, **AMKTRET**= Average Market Return,
SD= Standard Deviation, **CV**= Coefficient of Variation, **SI**= Sharp's Index

Analysis Of Results

Statistical analysis of the results in Tables 3, 4 and 5 are reported in Table 6. These results look strong. They show that performance of firms as measured by all the variables in the undiversified group, is markedly below that of the firms in the highly diversified group and that these results are statistically significant. The results also show that the performance of firms in the moderately diversified group is better than that of the firms in the undiversified group. These results are also statistically significant. The performance difference between the moderate and highly diversified group however, is not always that clear. When measured on AROA, Sharpe Index and CV, the results are in the expected direction and significant, but when performance is measured by AROE and its SD, and AMKTRET and its SD, the results are not as clear.

TABLE 6
Statistical Analysis of Performance Variables

STATISTIC	AROA	AROE	AMKTRET
n	729.33	727.33	499.33
F max (3,n)	20.17*	1747.78*	16.32*
F12	58.37*	0.67*+	0.27+
F23	3.43*	1747.78*	16.32*
F13	200.17*	1088.33*	4.45*
t'12	6.29*	1.41****	1.99**
t'23	2.91*	1.86***	0.96*+
t'13	7.38*	2.08***	3.07*

*Significant at 0.01 or less; **Significant at 0.025; ***Significant at 0.05;
****Significant at 0.1; *+Significant at 0.25; +Not significant.

The results suggest that we can reject the null and accept the alternate hypothesis: that higher the degree of diversification, greater is the average performance, measured in risk-return terms. The following paragraphs analyze the results for each performance variable in greater detail.

Analysis of Results by Performance Class

We further massage our data by subdividing each diversification category: undiversified, moderately diversified, and highly diversified, into three performance classes by adding and subtracting one standard deviation from the average ROE. Thus, each category is divided into three performance subclasses: Average ROE + 1 Std. Dev.; Average ROE; and Average ROE - 1 Std. Dev.. This gives rise to a total of nine performance classes, three for each

level of diversification. If the hypothesis that the higher the degree of diversification, the higher the performance is robust, then we should expect it to hold when we compare performance across the performance sub-classes. That is; the high, average and below average ROE performance of highly diversified firms should be higher than the respective performance of the three moderately diversified groups, and each of the three moderate performance groups should have higher average ROE as compared to each of the three undiversified groups. If this relation holds then we can say with greater degree of confidence that diversification of firms leads to higher performance for all classes of firms.

We, therefore, hypothesize that the best, the average and the medium performing groups demonstrate a consistent pattern of performance across the three diversification groups on both risk and return dimensions.

TABLE 7
Robustness by Performance Class and Degree of Diversification – 1986-1990

	X - o (Worst Performance)			X (Average Performance)			X + o (Best Performance)		
	AROE	SD	CV	AROE	SD	CV	AROE	SD	CV
Undiversified	-59.53	103.16	NA	2.46	6.87	2.79	35.28	36.44	1.03
Moderately Diversified	-5.78	5.58	NA	4.21	2.19	0.59	12.59	3.30	0.26
Highly Diversified	2.0	0.72	0.27	5.27	1.60	0.30	9.52	0.87	0.09

AROE= Average Return on Equity; SD= Standard Deviation

Table 7 shows classification of firms based on degree of diversification and by performance class. These results are both in expected and unexpected directions. The performance for the low and average performing firms, both in terms of risk and return diversification is in expected directions. But the results for the high performance group is found to be in the expected direction only for risk, while for the return measure the performance is in the opposite direction.

In the *worst performance* sub-class, the AROE of undiversified firms is -59.53, and the SD is 103.16. As we go toward increasing level of diversification, AROE performance increases to -5.78 and SD drops down to 5.58 for the moderate group. For the highly diversified group, AROE becomes +2 and SD falls to 0.72.

In the *average performance* sub-class, the AROE for the undiversified group is 2.46, and SD is 6.87. For the moderately diversified group, ROE increases to 4.21 and SD falls to 2.91. For the highly diversified group, AROE increases to 5.27 and SD falls 1.60. The results for these two performance sub-classes are consistent with the results obtained for the entire group as shown in Table 3.

The results for the *best performance* sub-class show interesting results. The AROE for the undiversified group is 35.28 and the SD is 36.44. AROE for the moderately diversified group decreases to 12.59. SD also decreases to 3.3. For the highly diversified group, AROE drops to 9.52, nearly a fourth of the undiversified group, and the SD decreases to 0.87, one thirty sixth of the undiversified group.

Clearly the results for the best performance class are contrary to earlier findings as far as ROE is concerned, but they are in expected direction as far as standard deviation is concerned. We are, however, able to reject the null hypothesis if we look at CV (Risk per unit return). The value of CV decreases as we move from undiversified to highly diversified group.

These results suggest that dominant firms operating with core competencies and operating in less competitive environments are better off concentrating on one business segment. Our results show that such firms have superior returns but are unable to diversify away market risks. These firms may waste investor resources by diversifying into other businesses. On the other hand, firms operating in markets where they face considerable competition and have fewer core competencies, or are unable to dominate their markets, they are likely to be better off diversifying, as it would reduce risk for such firms and increase average returns.

SUMMARY AND CONCLUSIONS

The study began with questions regarding discrepancies in empirical and theoretical investigations into the relationship between firm diversification and performance. Our results suggest that the average performance of diversified firms (especially highly diversified ones) perform well on a risk-return basis on accounting measures as well as market-based measures, when compared with group of firms that are not as highly diversified. Managers tend to judge performance using accounting measures such as ROE and ROA where as financial markets use market-based measures such as MKTRET. Our results show that on both types of performance measures, the group of diversified firms on average tend to perform better. The data show that with an increasing degree of diversification, the average return on assets, average return on equity and average market return, increase and the average risk per average unit return decreases. The results are clearer when comparisons are made between the highly diversified and the undiversified group, and the moderate and undiversified groups. The results are not as sharp when we compare results between the moderately diversified and the highly diversified group. The implication of the finding is that in general diversification is helpful but it does not tell us how much of it is helpful. Additional research on economies of scope for these group of firms may throw some light on this issue. The marginal ambiguity between the moderate and the highly diversified groups may also be the result of eliminating the contingent variables like type, modality and extent of diversification. Controlling these variables may provide greater insight and clarify the differences between the moderate and the highly diversified groups of firms and lend support to theory building.

The most surprising finding of our study was about the class of "best performing" firms. The study found that AROE of undiversified firms was four times better than the highly diversified firms, but such firms had 36 times the volatility of the highly diversified firms. This result implies that the best performing firms, if they diversify, will reduce their earnings, but dampen the volatility of their returns. Managers of such firms therefore will be tempted to dampen the volatility of returns by diversification. Such actions, according to this study will lead to a reduction in returns, but the reduction in volatility of returns will be much greater. This is clearly beneficial to managers and employees of the firm, but benefits of such insurance for the shareholders is not as clear. The implications for investors are that, if they risk such high performance, they ought to stay in for the long haul, and have high tolerance for volatility. But even for this class of firms based on coefficient of variation, we feel that the average performance of highly diversified firms tends to be better than that of the undiversified firms. One must judge Jack Welch, the CEO of General Electric (GE) in this context. GE's top management group insists that each of their divisions must be either number one or number two in their specific product markets. Thus GE, a high performing conglomerate is trying to emulate characteristics of a dominant undiversified firm at the product market level in order to earn very high returns and concomitantly it practices the art of being an aggressive and active conglomerate at the corporate level to reduce the risk engendered by dominant firms. But not all high performing firms are as careful, well managed or lucky.

The study echoes the belief of senior corporate executives who think diversification enhances firm value because it contributes to improvement of the firm's risk-return profile. The results also speak to the concerns of investors. Diversification, especially for the truly high performing firms reduces risk but at the cost of returns. There is undoubtedly a trade-off here between risk and return when managers of such single firms diversify from their core business. Thus diversification does buy insurance for the managers which may help managers and employees more than investors. But in the case of the average and the low performing single firms (most likely the non dominant firms), gain from diversification in return and risk terms, seem significant. The moderate and highly diversified groups also benefit from diversification on risk and return dimensions but their performance is not stellar by any stretch of the imagination. One can argue that diversification tends to reduce the already severe competitive threat faced by the majority of firms in these groups. The implications for investors follow suit. They are better off picking stocks of well-diversified firms as these deliver better returns over time as compared to moderately diversified or undiversified firms. The finding that on average, highly diversified firms, including conglomerates, show better performance than single product firms or moderately diversified firms, supports the belief of corporate executives but is contrary to the viewpoint of research in finance.

A classification scheme by definition remains arbitrary, no matter how well we justify the scheme. The only safeguard against such arbitrariness is to demonstrate that the results of the study are invariant to changes in arbitrarily set classification boundaries. We were somewhat successful in showing that changing classification boundaries did not change the thrust of our results. Both methods showed that AROE of highly diversified group of firms was greater than that of the undiversified group. But this still is a fruitful direction for future research. We were able to examine ROE alone because of data limitations. The 1981-1990 data set was not consistent for all the

variables and segments of businesses. Other variables need to be tested. Researchers may also want to know if, at what point, the results are no longer invariant to SR classification values.

Our study has several other limitations. The research period (1984-1990) of this study does not match the time periods reported in earlier studies. If diversification matters as a strategy, then it ought to do so no matter what the time period. This study has examined pooled time series data and finds the results consistent with expectations. Subject to the availability of data, replication over different time periods will adequately address this issue.

Economic arguments require that we measure performance in terms of cash flows. We do need to look at the net present value of cash flows to make strong statements about the usefulness of a diversification strategy in the capital budgeting sense. Market return may be a reasonable substitute but the examination of the net present value of cash flow may be necessary from the point of view of the stock market. This is left to future research.

Although SR is an acceptable measure of diversification, the entropy measure (Hoskisson, et. al., 1993) has become an important and probably a better measure of diversification. This study was extensive enough. Perhaps multiple measures of diversification in a future study, will alleviate methodological concerns about the appropriateness of diversification measures.

The research design of this study differs somewhat from similar earlier studies, and as stated at the outset, it does not address the question whether investor portfolios outperform diversified firms. Therefore, while addressing several possible objections, we urge caution in accepting these results, and suggest future research to verify the findings reported here.

Finally, this study examines the association between corporate diversification and performance per se. It does not address the differences in performance caused by types of diversification, like related, or unrelated; nor does it use modifying variables like firm size and other firm-level factors, or modalities of diversification such as internal product development or mergers and acquisitions. The results of this study are interesting enough to warrant the inclusion of variables that control for industry structure and contingency variables such as interest rates or the state of the economy; or underlying managerial motivation like risk reduction, agency problem, or moral hazard. Such controls will provide greater insight into the diversification strategy, as a practice and as a phenomenon.

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