Summer 1996

Business Risk and Performance: An Examination of Industry Effects

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Abstract

Both business risk and industry sales volatility decreased across the computing equipment manufacturing, airline and pharmaceutical industries. Earnings performance and industry environmental munificence were both the highest among airlines. High volatility, while posing greater business risks, also offered the opportunity for improved risk-performance payoffs in the computer industry. Individual firms in the computer and pharmaceutical industries successfully reduced business risk while simultaneously increasing earnings performance (i.e., negative within-firm correlations), indicating idiosyncratic firm-specific effects.

Introduction

In addition to being rewarded for managing business risk, managers are also very concerned with business risk because their managerial employment risks are linked to it. The combined variability (i.e., uncertainty) in receiving managerial rewards such as salary, bonus, stock options, other long-term incentives and promotions, plus intangibles such as job satisfaction, reputation in the external job-market, expertise, and goodwill, along with the catastrophic possibility of downside events such as layoffs or termination, equates to managers' employment risks. These managerial risks are closely tied to total variability in firm-specific outcomes in size, sales, earnings, or market share (i.e., total business risk).

The industry context has an important influence on both business risk as well as performance (Livingston, 1977; Oviatt & Bauerschmidt, 1991; Reilly & Drzycimski, 1974). Industry environments are characterized by differences in volatility as well as munificence (Aldrich, 1979; Dess & Beard, 1984; Pfeffer & Salancik, 1978). Volatility increases the unpredictability regarding major factors in the firm's external task environment. This unpredictability also increases variability in firm outcomes such as sales and returns, thereby increasing total business risk. On the other hand, munificence refers to the capacity of the industry environment to support sustained growth. Increased munificence in the industry environment permits the accumulation of slack resources that provide a cushion which insulates the firm against unexpected surprises. Since these slack resources can be applied by the organization towards decreasing the variability in organizational outcomes such as sales and profits, increased industry munificence can effectively reduce business risk.

As mentioned earlier, increased volatility results in greater fluctuations in performance. However, the average level of performance might still remain high (or low). This distinction between variability in performance (which causes risk) and average performance is important when considering the impact of industry sales volatility on performance. Conversely, lower levels of volatility might also be associated with high or low average levels of performance across all the industry firms. This makes the directionality of the impact of industry volatility on performance difficult to assess. By contrast, munificence offers opportunities to enhance organizational performance through the slack resources that could be applied towards this end.

Since industry conditions affect both business risk as well as performance (Aber, 1976; Boudoukh, Richardson, & Whitelaw, 1994; Fertuck, 1975; King, 1966; Meyers, 1973; Roll,

1988), the relationship between them could also be affected by changes in the industry environment. For such changes to occur, both risk as well as performance should covary with munificence or volatility. In order to investigate the interplay among these different effects, this study investigated industry environmental volatility, munificence, total business risk and earnings performance across three industries. The industries were selected because of differences in their cyclicality and structure that would predicate different levels of volatility, munificence, and business risk. The next section elaborates on the theoretical linkages described in the literature and the tested hypotheses.

Theoretical Relationships

Unlike shareholders who can theoretically diversify away systematic risk (Bettis, 1983) in the context of efficient capital markets (Callahan & Mohr, 1989), managers cannot reduce employment risks through seeking diversified avenues of employment. The value of their human capital (Finkelstein & Hambrick, 1988; Mincer, 1970) is based on specific experience and knowhow in a particular field or technology that is applicable only in a limited sector of the economy and sometimes even restricted to an individual firm. This makes it difficult for managers to seek diversified sources of employment, and consequently links the value of their human capital with the fortunes of a particular industry or firm. As a result, the value of individuals' human capital often varies with the corresponding fluctuations in the fortunes of the industry or organization to which they are linked. By virtue of being largely firm and industry-specific, managerial employment risks are tied to business risk.

The agency motive for risk reduction (Amit & Wernerfelt, 1990) suggests that risk-averse managers seek to enhance the stability of the business through ensuring a stable stream of earnings. Through reducing the probability of bankruptcy, this protects their job security and preserves their investment in firm-specific human capital (Aaker & Jacobson, 1987; Amihud & Lev, 1981; Amit & Wernerfelt, 1990). The work of agency theorists (Fama, 1980; Fama & Jensen, 1983; Jensen & Meckling, 1976) also stresses the importance of total business risk for managers. The consensus emerging from the above body of work is that managers are concerned with total business risk. Since total risk is comprised largely of unsystematic risk (Lubatkin & O'Neill, 1987) which varies from firm to firm as well as across industries (Aber, 1976), we can expect differences in total business risk between industries. Thus,

H1: There will be differences in total business risk across industries.

As stated earlier, uncertainty in the industry environment can arise from faster rates of change, or unpredictability regarding the actions of major stakeholders. The faster the pace of change and the greater the unpredictability in the actions of important stakeholders (viz. customers, shareholders, suppliers, creditors) on whom the organization has critical dependencies (Freeman, 1984), the greater the volatility and consequent variability in organizational outcomes. Unpredictability concerning resources in the industry environment that the organization is dependent on can also create surprises that impact outcomes such as quarterly earnings, stock price, and market share. Therefore we expect greater volatility to be associated with greater business risk. Thus,

H1a: Total business risk increases with industry volatility.

Munificence refers to the capacity of the industry to support sustained growth. Greater growth can hide inefficiencies through offering the opportunity to build up slack resources. These slack resources serve as buffers that can be employed to safeguard against unexpected downturns. The slack can also be used to smoothen out the variability in organizational outcomes that creates greater business risks. Thus increased munificence is associated with reduced business risk. Consequently,

H1b: Total business risk decreases with industry munificence.

Performance differences occur across different industry settings for a variety of reasons (Dess, Ireland & Hitt, 1990; Porter, 1980; Roll, 1988; Reilly & Drzycimski, 1974). The structure-conduct-performance paradigm in industrial organization literature (Porter, 1981) identifies the industry and its competitive structure as being major determinants of firm performance. Consequently we can expect levels of performance to differ across industries.

H2: There will be performance differences between industries.

As argued earlier, there are across-industry differences in volatility. However, such differences in volatility may not be the sole drivers causing performance differences. With both high as well as low levels of industry volatility, average industry performance could also be either high or low. The unpredictability caused by high volatility (while creating conditions of greater risk) may offer unexpected opportunities for improved returns. But on the other hand, the firm's performance could also suffer (i.e., be low) on account of the unpredictability. Conversely, low volatility increases predictability which can lead to stable profit streams. Based on previous arguments, these stable profit streams could be low or high. Consequently we do not propose any linkage between industry volatility and performance.

By contrast, munificence is more instrumentally related to performance since it offers firms the ability to generate slack resources, which can then be used to improve the average levels of performance. Thus,

H2a: Industry performance is positively related to munificence

Financial theory proposes a positive relationship between risk and return (Bowman, 1980; Fama, 1968; Fiegenbaum & Thomas, 1986; Reilly & Drzycimski, 1974; Van Horne, 1980). Previous work that has examined the influence of industry contextual factors on the risk-return relationship (Cool, Dierickx, & Jemison, 1989; Fiegenbaum & Thomas, 1986; Jemison, 1987; Oviatt & Bauerschmidt, 1991) did not specifically examine the impact of industry volatility or munificence on business risk and its relationship with performance.

For the reasons stated earlier, volatility has a potentially positive impact on (i.e., increases) business risk. Both business risk as well as performance must covary (with volatility) for there to be consistent changes in the relationship (between the two) under conditions of changing industry volatility. For example, if industry volatility increased business risk while not simultaneously affecting earnings performance, it attenuates the strength of the relationship between risk and performance. For theoretical reasons we did not earlier propose a relationship between volatility and performance. Consequently, the effect that volatility would have on the relationship between business risk and performance would be (as described earlier), to attenuate the strength of the relationship. Therefore we propose that increasing industry volatility reduces the strength of the relationship between business risk and earnings performance.

H3a: As volatility increases, the relationship between business risk and earnings performance becomes weaker.

By contrast, we postulated that munificence would (through the slack resources generated) offer opportunities to both reduce business risk as well as improve average levels of performance (refer the earlier discussions leading to hypotheses 1b and 2a). Thus increasing munificence can potentially create a negative relationship between business risk and performance. Consequently,

H3b: As munificence increases, the relationship between business risk and earnings performance becomes increasingly negative.

Methods

Sample

The study was conducted using firms from three different industries: 16 U. S. airlines (SIC 4512) selected from 'Air Carrier Financial Statistics'; 32 U.S. computer equipment companies (SIC 3573) selected from Datamation, Standard & Poor's Industry Surveys and U.S. Industrial Outlook; 47 U. S. drug & pharmaceutical companies (SIC 2834) selected from 'Ward's Directory of U. S. Corporations' and 'Dow Jones Directory of Corporations'.

The three industries were selected using the following criteria. Each industry consisted primarily of single or dominant business firms (Rumelt, 1974) concentrated in their respective industries. Thus the confounding effects (on both risk and performance measures) of widely diversified companies operating in multiple industry environments was avoided.Airlines are primarily a service industry, computers are a mix between unit production and large scale assembly (depending on the characteristics of the individual firm), while the pharmaceutical industry uses continuous processing (Woodward, 1965). These technological differences along with the differences in competitive structure and product life cycle stage would vary the degree of volatility and munificence experienced by firms across these three industries. In addition, pharmaceuticals are a non cyclical industry.

By contrast, airlines and computers are more affected by economy wide changes that take place during business cycles.

The size (i.e., total assets, total revenues) and profitability (i.e., ROA, ROE) distributions of the sampled firms in the three industries are given in Tables 1 & 2 below.

Data Sources

Return on equity figures and quarterly earnings per share data (used for computing business risk) for firms in all three industries were obtained from the Compustat data base. Yearly industry sales figures (1985-'90) for the three industries used to calculate volatility and munificence were obtained from the 'U.S. Industry Outlook' (1992).

Measures

Total Risk: An earnings measure based on the variance in earnings per share (i.e., EPS adjusted for stock splits) over twelve quarters (3 years) prior to the estimation period was used for total business risk. Accounting numbers have previously been related to measures of real economic return (Beaver & Manegold, 1975; Jacobson, 1987). Variance of quarterly results has been previously employed as a measure of risk (Beaver, Kettler & Scholes, 1970; Gahlon & Gentry, 1982).

Performance: Return on equity (net income/book value of equity) was the chosen measure of earnings performance.

Industry environmental dimensions: The natural logarithm of

TABLE 1
SAMPLE SIZE DISTRIBUTION

	AIRLINES		COMPUTERS		PHARMACEUTICALS	
($ MILLION)	TOTAL ASSETS	TOTAL REVENUES	TOTAL ASSETS	TOTAL REVENUES	TOTAL ASSETS	TOTAL REVENUES
< 10	-	-	-	-	5	9
≥ 10 < 50	1	1	-	-	11	8
≥ 50 < 100	-	-	-	-	4	6
≥ 100 < 500	3	3	17	15	8	3
≥ 500 < 1000	2	3	7	8	1	4
≥ 1000 < 5000	7	6	6	8	13	12
≥ 5000 < 10,000	3	3	1	-	4	4
> 10,000	-	-	1	1	-	-
Missing	-	-	-	-	1	1

TABLE 2
SAMPLE PROFITABILITY DISTRIBUTION

	AIRLINES		COMPUTERS		PHARMACEUTICALS	
(%)	ROA	ROE	ROA	ROE	ROA	ROE
< 0	2	6	1	1	12	13
≥ 0 < 5	9	1	2	10	2	3
≥ 5 < 10	-	5	6	3	5	4
≥ 10 < 20	-	4	18	11	15	11
≥ 20 < 30	-	-	5	4	8	10
> 30	-	-	-	-	3	5
Missing	5	-	-	3	2	1

yearly industry sales was regressed against time (for the time period 1985-'90) using the following equation:

$$y_t = b_o + b_1.t + a_t$$

where
y= industry sales for each year,
t= year, and
a= residual.

Munificence was measured by the antilog of the regression slope coefficient in the above equation, while volatility was measured by the antilog of the standard error of the regression (see Dess & Beard, 1984; Keats & Hitt, 1988). All variables of interest were collected for the sampled firms in the three industries over the common time period 1985-1990.

Analyses and Results

Hypotheses 1, and 2 were tested using the general linear model (GLM) procedure in SAS. They correspond to one-way ANOVA tests. The results are in Table 3, which also provides details of the observed variation in volatility and munificence across industries.

Industry volatility was the greatest in computers, followed in order by the airline and pharmaceutical industries. Munificence was the greatest in airlines, followed by computers and pharmaceuticals. Total business risk was the highest in computers followed in decreasing order by airlines and pharmaceuticals. Hypothesis 1 was thus supported. As noted above, volatility also differed across the three industries in the same decreasing order. The parallel between decreases in business risk and decreases in volatility provides support for hypothesis 1a. The variation in business risk did not parallel variations in munificence, indicating an absence of support for hypothesis 1b.

The airline industry's performance (ROE) was significantly dif-

Table 3

DIFFERENCES IN BUSINESS RISK, ROE, ENVIRONMENTAL VOLATILITY ACROSS THREE INDUSTRIES[1]

	Airlines(A)	Computers(C)	Pharmaceuticals(P)	Comparisons (A-C)	(A-P)	(C-P)	F[3]
Total Business[2] Risk	3.67	16.97	0.04	*	*	*	114***
ROE	16.1	12.74	13.75	*	*	ns	5.61**
Environmental Volatility[4]	1.005 (2)	1.01 (1)	1.004 (3)				
Environmental Munificence[5]	1.10 (1)	1.07 (2)	1.04 (3)				

1 Airlines = 16 firms
Computers = 32 firms
Pharmaceuticals = 47 firms
2 Var. (Quarterly EPS over 12 quarters); Means comparisons based on logarithmic transformations
3 * $p \leq 0.05$
** $p \leq 0.01$
*** $p \leq 0.001$
4 Std. Error /Mean; Figures in parentheses indicate volatility ranking for industry
5 Antilog (Regression Coefficient); Figures in parentheses indicate munificence ranking for industry

ferent from the performance of the other two industries. There were no performance differences between computers and pharmaceuticals. Thus hypothesis 2 found partial support. Airlines which had the most munificent industry environment, also had the highest performance. Computers and pharmaceuticals which had less munificent industry conditions had lower performance scores (though not significantly different from each other). Thus hypothesis 2a found only partial support.

Hypotheses 3a and 3b was tested using the Within-And-Between Analysis (WABA) at the firm level of analysis (ref. Dansereau, Alutto, & Yammarino, 1984). As the heart of WABA, the Covariance Theorem postulates that a raw, unadjusted correlation of risk with earnings performance is equal to the weighted sum of the between-cell and within-cell variances and covariances (Przeworski & Teune, 1970). In the within-firm model the primary source of variability in risk and performance measures is within a firm. The between-firm model suggests that the variability in risk and performance from year to year is relatively minor compared to the major differences that can be found between firms. The statistical analog for this between-firm model is an ANOVA in which firms are aligned with statistical cells and a significant F statistic would evidence the between-firm condition. Within-and-Between-Analysis (WABA) goes beyond the ANOVA and tests the covariance theorem which states that any correlation is equal to the weighted sum of the between-cell and within-cell variances and covariances as shown in the equation below:

$$r_{Txy} = (eta_{Bx})\,(eta_{By})\,(r_{Bxy}) + (eta_{Wx})\,(eta_{Wy})\,(r_{Wxy})$$

where,
rTxy = total firm-level correlation between x and y
etaBx = between-eta correlation of variable x (i.e., business risk)
etaBy = between-eta correlation of variable y (i.e., earnings performance)
rBxy = between-firm correlation of x and y
etaWx = within-eta correlation of variable x
etaWy = within-eta correlation of variable y
rWxy = within-firm correlation of x and y.

The etas can be mathematically derived by calculating the square root of the R^2 associated with one-way ANOVAs. Significant values for the between-firm eta would suggest that there were significant differences between firms on that particular variable. Likewise, a significant between-firm correlation (rBxy) would indicate that all industry firms with high average risk also had high performance. Conversely, a significant within-cell eta denotes differences within firms on that variable. A significant within-firm correlation (rWxy) suggests that the relationship between risk and performance was within individual firms, with no commonality in the pattern across all firms in the industry.

Since a frequency analysis indicated skewed distributions for ROE and total business risk, recoding to reduce the range and natural logarithmic transformations were undertaken for these two variables in order to ensure normal distributions. The results of WABA for hypotheses 3a and 3b are in Table 4.

The total correlation between business risk and performance was significant only in the computer industry where there was a negative relationship (i.e., rTxy = -.49***). The relationship was not significant in airlines (i.e., rTxy =-.14) and pharmaceuticals (i.e., rTxy = -.06). This indicated that computer firms were simultaneously reducing business risk while increasing earnings performance, a significant achievement given that their industry environment was the most volatile. Further, as volatility decreased from computers to airlines and pharmaceuticals (ref. Table 3), the strength of the relationship between business risk and earnings performance attenuated from -.49*** to -.14 and -.06 (see Table 4). This provides support for hypothesis 3a. An examination of the between-group correlations (i.e., rBxy) provides additional confirmation regarding the nature of the industry effect. The between-firm correlations were highly significant (refer Table 4) in the computer industry [i.e., rBxy = -.43(a)/-.55***(c)/.03(p)], where (a)= airlines, (c) = computers, and (p) = pharmaceuticals. This indicated that on average across all industry firms, higher performing firms in the highly volatile computer industry were consistently reducing business risk while increasing earnings performance. Moreover, as the volatility decreased (i.e., from computers across airlines to pharmaceuticals), the strength of the between-firm correlation coefficients also decreased (as shown above). This contradicts hypothesis 3a.

Hypothesis 3b concerning the effect of industry munificence on the risk-performance relationship also did not find support. As munificence increased from pharmaceuticals to computers and airlines, the increases in the total correlation between risk and performance did not follow a similar pattern. The same pattern was manifested in the between-firm correlations. The two sets of results taken together indicate a lack of support for hypothesis 3b.

Overall, though there were differences across the three industries in business risk and performance (performance only in the case of the air-

Table 4

RISK-PERFORMANCE CORRELATIONS(i.e., WABA)[1] AT THE FIRM LEVEL OF ANALYSIS

	Airlines[2]	Computers	Pharmaceuticals
γ_{Txy}	-.14	-.49***	-.06
γ_{Bxy}	-.43	-.55***	+.03
γ_{Wxy}	+.22	-.47***	-.20**

1 γ_{Txy} = Total pearson correlation between business risk and roe
γ_{Wxy} = Between firm correlation (based on firm average)
γ_{Wxy} = Within firm correlation

2 * $p \leq .05$
** $p \leq .01$
*** $p \leq .001$

line industry-refer Table 3), the relationship between these variables is evident primarily in the computer industry. This suggests that in computers, industry conditions (medium munificence and high volatility) along with other common industry-specific influences (such as industry structure, nature of demand, rivalry, entry barriers) were simultaneously increasing earnings performance while reducing business risk across all the firms in the industry (on average). In the airline and pharmaceutical industries on the other hand, such common industry and/or other contextual conditions that concurrently affected business risk and performance were not in evidence.

Higher business risk in the computer industry could be the effect of high volatility. The relatively lower earnings performance in the pharmaceutical industry (i.e., compared to airlines) was probably caused by the lowest levels of munificence among the three industries examined. Alternatively, high levels of munificence in the airline industry can explain the highest levels of performance among the three industries.

The within-firm correlations (shown in Table 4) were significantly negative for computers and pharmaceuticals, but not for the airlines [i.e., rWxy =.22(a)/-.47***(c)/-.20***(p)]. The significant within-firm results (in computers and pharmaceuticals), in addition to representing less business risk with higher performance, also illustrate an additional point. There could be individual firms within industries that succeed in reducing business risk while simultaneously increasing performance, even if all the other firms in these industries do not (on average) do so. These individual firm effects are however not the result of industrywide factors such as industry-wide environmental conditions, nature of rivalry or demand uncertainty. These effects are idiosyncratic to the firm and could be the result of firm-specific strategic decisions that reduce business risk while simultaneously enhancing performance.

Discussion

Agency theory (Eisenhardt, 1989; Fama, 1980; Fama & Jensen, 1983; Jensen & Meckling, 1976), financial theory (Amihud & Lev, 1981), as well as the management literature (Bettis, 1983; Freeman, 1984) have suggested that interests of managers and shareholders do not always coincide. This translates into differing assumptions regarding the motivations of managers towards the various components of risk (Aaker & Jacobson, 1987; Baird & Thomas, 1985; Lubatkin & O'Neill, 1987). But finance theory and the CAPM assume that shareholders can diversify away unsystematic risk (better than individual firm managers can reduce them). But given the managerial incentive to concentrate on dealing with business risk, their ability to do so is determined to a large extent by conditions in the organization's industry environment. Consequently, the impact of industry-specific conditions such as munificence and volatility on business risk and its relationship with performance is an area that deserves greater attention.

As expected business risk increased in parallel with industry volatility. Since the low volatility industries demonstrated less business risk, managerial ability to reduce business risk appeared to improve under conditions of reduced environmental volatility. From a theoretical standpoint, these results presage different levels of agency motives for business risk reduction across industries characterized by different levels of volatility. Overall, managers may also exhibit a greater inclination to influence business risk because of its close links with their employment risks. There is no evidence to suggest a strong influence of munificence on business risk.

Industry performance appeared to be influenced by munificence, with the airline industry having the highest levels of both munificence and performance. Conversely, the pharmaceutical industry had the lowest munificence along with average performance.

The overall relationship between business risk and performance was negative in the highly volatile computer industry. Here, all firms (on average) managed to simultaneously decrease business risk while increasing performance. In addition, as volatility decreased (in airlines and pharmaceuticals) the strength of the negative correlation between risk and performance decreased. A similar pattern was evident in the between-firm correlations. These results were evidently caused by common intra-industry similarities (and inter-industry differences) in volatility. The impact of munificence on the relationship between risk and performance was less apparent given that directionality was absent in the changes in the relationship as we went across industries.

There were negative within-firm relationships observed in computers and pharmaceuticals, indicating that in these industries, individual firms managed to simultaneously achieve a reduction in

business ask along with increases in performance. Within-firm correlations are idiosyncratic and unique to individual firms and cannot be attributed to industry wide effects. These could arise from special strategies or resource-based advantages that individual firms exploited. In pharmaceuticals it could have been the research skills/expertise, repertoire of patents and financial resources that specific individual firms possessed. In computers it could be the unique technological advantages and process capabilities of individual firms. The airline industry exhibited an insignificant pattern of results in the tested relationship, perhaps because of factors unique to the industry.

The overall conclusion is that business risk (which is of concern to managers and a broader range of organizational stakeholders) varies across industries, and appears to decrease along with volatility. Earnings performance (which also differs across industries) appears to be more influenced by munificence. There is some evidence of the influence of volatility on the relationship between these two variables. The relationship between business risk and earnings performance could also be affected by other factors such as industry structure, barriers to entry, rivalry, nature of demand, firm strategy and characteristics of the capital market. We now discuss the implications of these findings for managers.

Managerial Implications

Highly volatile industry environments are likely to pose greater business risks, and by extension greater managerial employment risks. Such conditions are more prevalent in industries in the introductory or early growth stages of the product life cycle, where greater fluctuations in demand and supply characteristics exist. The computer industry was more volatile during the period of the study, partly because of the rapid growth it underwent during the latter half of the 1980s (especially in the mini and micro computer segments). In addition, rapid changes in product standards and the relative ease of entry created a volatile competitive environment for industry participants. The technology and product specifications were widely disseminated and being continuously upgraded (especially in the PC market), making access to technological know how relatively ineffective as a factor in deterring new entry. Access to distribution channels, which is another major entry barrier into other consumer durable goods industries was easily overcome by later entrants such as Dell Computers and Gateway who bypassed existing channels and set up mail-order distribution arrangements. The entry bonier created by the need for capital resources was overcome through entering niche markets, focusing on specialized product (or component) segments, or becoming an unbranded captive supplier of generic products to an established brand manufacturer. Managers who prefer less turbulent conditions should opt for industries which pose more significant entry barriers for later entrants, than was characteristic of the computer industry during the late 1980s. However, the higher risk resulting from environmental volatility also came with greater opportunity, since computer industry managers were able to simultaneously decrease business risk while increasing earnings performance.

By contrast, in pharmaceuticals, potential entrants were deterred by the need for financial resources and R & D skills. Existing competitors (especially the bigger pharmaceutical firms like Merck, Pfizer, Eli Lilly, and others) had collections of block-buster drugs that enjoyed patent protection. These ensured a stable earnings stream for their owners. The existing companies also had channels of distribution sewn up through their well trained sales forces and physician contacts. The above two factors alone posed formidable disadvantages to potential later entrants. In addition, the overall environment for health care was more benign in the late 1980s. All these factors combined to reduce the industry's environmental volatility. Thus, the pharmaceutical industry with its high level of entry barriers offered stable average returns for lesser business risk. However even in this industry (as in the earlier case of computers), managers of individual firms could exploit idiosyncratic firm specific advantages to simultaneously decrease business risk while improving earnings performance.

For the airline industry, the long cycle of economic expansion beginning in the early 1980s provided continuous growth in air traffic revenues and profits. Even though deregulation (in the early 1980s) lifted regulatory restrictions on entry into the industry, the constraints imposed by the finite number of departure gates and landing slots at major airports (which were already monopolized by existing competitors) created some (though not insurmountable) entry barriers. In addition, the computerized reservation systems of major carriers like American's Sabre) to which most travel agents were hooked up on-line, was another obstacle that newer, later entrants had to overcome. These entry barriers (along with sustained industry growth)

helped maintain overall industry volatility at medium levels (the misfortunes of individual carriers such as Braniff, Eastem and Panam notwithstanding). Thus, an industry with high levels of munificence (and entry barriers) such as airlines offered the best prospect for high profits (with relatively lesser challenges).

Suggestions for Future Research

The moot question of whether firm or industry-level phenomena are more important influences on business risk and performance is left unresolved by the research results. Undoubtedly managers have better strategic control over firm-level factors. Our results suggest that industry level phenomena are also important influences on both risk and performance. Some industry level contextual influences on business risk and performance that could be examined by future research would be industry structure, barriers to entry, extent of rivalry, the nature of demand and the stage of the product life cycle.. At the firm level, it would be appropriate to examine the effects of firm strategy and core competencies on risk and performance variables. Finally, the characteristics of the capital market (i.e., 'bull' versus 'bear' periods) is also an important influence on the examined variables. Only by examining the effect of each of these factors separately (as well as collectively) will the question of 'which set of influences are more important' be answered. All these are possible extensions and interesting areas for future research.

The helpful comments of Abdul Rasheed are acknowledged.

References

1. Aaker, D.A., & Jacobson, R, "The role of risk in explaining profitability", *Academy of Management Journal*, Vol. 30, No. 2, pp. 277-296, 1987.
2. Aber, J. W., "Industry effects and multivariate stock price behavior", *Journal of Financial & Quantitative Analysis*, Nov., pp. 617-624, 1976.
3. Amihud, Y. & Lev, B., "Risk reduction as a managerial motive for conglomerate mergers", *Bell Journal of Economics*, Vol. 12, pp. 605-617, 1981.
4. Aldrich, H.E., *Organizations and Environments*, Prentice-Hall, Englewood Cliffs, N.J., 1979.
5. Amit, R., & Wernerfelt, B., Why do firms reduce business risk?" *Academy of Management Journal*, Vol. 33, No. 3, pp. 520-533, 1990.
6. Baird, I. S., & Thomas, H., "Towards a contingency model of strategic risk taking", *Academy of Management Review*, Vol. 10, No. 2, pp. 230-243, 1985.
7. Beaver, W., Kettler, P., & Scholes, M., "The Association between market determined and accounting determined risk measures", The Accounting Review, pp. 654-682, 1970.
8. Beaver W., & Manegold, J., "The association between market determined measures of systematic risk", *Journal of Financial and Quantitative Analysis*, Vol. 10, pp. 231-284, 1975.
9. Bettis, R.A., "Modern financial theory, corporate strategy, and public policy: Three conundrums", *Academy of Management Review*, Vol. 8, pp. 406-415, 1983.
10. Boudoukh, J., Richardson, M., & Whitelaw, R. F., "Industry returns and the Fisher effect", *Journal of Finance*, December, Vol. 49, No. 5, pp. 1595-1615, 1994.
11. Bowman, E.H., "A risk/return paradox for strategic management", *Sloan Management Review*, pp. 17-31, 1980.
12. Callahan, C. M., & Mohr, R. M., "The determinants of systematic risk: A synthesis", *Financial Management*, May, Vol. 24, No. 2, pp. 157-181, 1989.
13. Cool, K., Dierickx, I., & Jemison, D., "Business strategy, market structure and risk-return relationships: A structural approach", *Strategic Management Journal*, Vol. 10, pp. 507-522, 1989.
14. Dansereau, F., Alutto, J.A., & Yammarino, F.J., Theory Testing in Organizational Behavior: The Variant Approach, Prentice-Hall, Englewood Cliffs, NJ, 1984.
15. Dess, G. G., and Beard, D. W., "Dimensions of organizational task environments", *Administrative Science Quarterly*, Vol. 29, pp. 52-73, 1984.
16. Dess, G. G., Ireland, R. D., and Hitt, M. A., "Industry effects and strategic management research", *Journal of Management*, Vol. 16, No. 1, pp. 7-27, 1990.
17. Eisenhardt, K.M., "Agency theory: An assessment and review", *Academy of Management Review*, Vol. 14, No. 1, pp. 57-74, 1989.
18. Fama, E.F., "Agency problems and the theory of the firm", *Journal of Political Economy*, Vol. 88, pp. 288-307, 1980.
19. Fama, E. F., "Risk return and equilibrium:

Some clarifying comments", *Journal of Finance*, March, pp. 29-44, 1968.
20. Fama, E.F., & Jensen, M.C., "Separation of ownership and control", *Journal of Law & Economics*, Vol. 26, pp. 301-326, 1983.
21. Fertuck, L., "A test of industry indices based on SIC codes", *Journal of Financial and Quantitative Analysis*, December, pp. 837-848, 1975.
22. Fiegenbaum, A., & Thomas, H., "Dynamic and risk measurement perspectives on Bowman's risk-return paradox for strategic management: An empirical study", *Strategic Management Journal*, Vol. 7, pp. 395-407, 1986.
23. Finkelstein, S., & Hambrick, D.C., "Chief executive compensation: A synthesis and reconciliation", *Strategic Management Journal*, Vol. 9, pp. 543-558, 1988.
24. Freeman, R.E., *Strategic Management: A Stakeholder Approach*, Pitman Publishing, Boston, 1984.
25. Gahlon, J. M, & Gentry, J. A., "On the relationship between systematic risk and the degrees of operating and financial leverage", *Financial Management*, pp. 15-23, 1982.
26. Jacobson, R., "The validity of ROI as a measure of business performance", *American Economic Review*, Vol. 77, pp. 470-478, 1987.
27. Jemison, D. B., "Risk and the relationship among strategy, organizational processes, and performance", *Management Science*, Vol. 33, No. 9, pp. 1087-1101, 1987.
28. Jensen, M.C., & Meckling, W.H., "Theory of the firm: Managerial behavior, agency costs, and ownership structure", *Journal of Financial Economics*, Vol. 3, pp. 305-360, 1976.
29. Keats, B. W., & Hitt, M. A., "A causal model of linkages among environmental dimensions, macro organizational characteristics, and performance", *Academy of Management Journal*, Vol. 31, No. 3, pp. 570-598, 1988.
30. King, B. F., "Market and industry factors in stock price behavior", *The Journal of Business*, Vol. 39, pp. 139-190, 1966.
31. Livingston, M., "Industry movements of common stocks", *Journal of Finance*, Vol. 32, No. 3, pp. 861-874, 1977.
32. Lubatkin, M., & O'Neill, H.M., "Merger strategies and capital market risk", *Academy of Management Journal*, Vol. 30, No. 4, pp. 665-684, 1987.
33. Meyers, S. L., "A re-examination of market and industry factors in stock price behavior", *Journal of Finance*, Vol. 28, No. 3, pp. 695-705, 1973.
34. Mincer, J., "The distribution of labor incomes: A survey with special reference to the human capital approach", *Journal of Economic Literature*, Vol. 8, pp. 1-26, 1970.
35. Oviatt, B. M., and Bauerschmidt, A. D., "Business risk and return: A test of simultaneous relationships", *Management Science*, Vol. 37, No. 11, pp. 1405-1423, 1991.
36. Pfeffer, J. & Salancik, G. R., *The External Control of Organizations: A Resource Dependence Perspective*, Harper & Row, New York, 1978.
37. Porter, M. E., "The contributions of Industrial Organization to Strategic Management", *Academy of Management Review*, Vol. 6, No. 4, pp. 609-620, 1981.
38. Porter, M.E., *Competitive Strategy: Techniques for Analyzing Industries and Competitors*. Free Press, New York, 1980.
39. Przeworski, A., & Teune, H., *The Logic of Comparative Social Inquiry*, Wiley, New York, 1970.
40. Reilly, F. K., & Drzycimski, E. F., "Alternative industry performance and risk", *Journal of Finance & Quantitative Analysis*, June, Vol. 9, No. 3, pp. 423-446, 1974.
41. Roll, R.,"R^2", *The Journal of Finance*, July, Vol. 43, No. 2, pp. 541-566, 1988.
42. Rumelt, R., *Strategy, Structure and Performance*, Harvard University Press, Cambridge, MA, 1974.
43. Van Horne, J.C., *Financial Management and Policy*, 5th ed., Prentice-Hall, Englewood Cliffs, NJ, 1980.
44. Woodward, J., *Industrial Organization: Theory & Practice*,. Oxford University Press, New York, 1965.