Comparing alternative explanations for accounting risk-return relations

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Abstract

Research into accounting risk-return relations largely relied on reference-based models of managerial choice. This focus ignores other explanations that may contribute to our understanding. Our study extends prior research by incorporating agency theory and implicit contracts theory into models based on the behavioral theory of the firm. We test our hypotheses in a large sample of US manufacturing firms in two different economic environments. Our results show some support for each theory, suggesting that multiple frameworks may better explain risk-return relations. Further, differences in results between the two economic environments imply that macroeconomic conditions may be important. © 2000 Elsevier Science B.V. All rights reserved.

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1. Introduction

Accounting risk-return research has received considerable attention since Bowman (1980) found a negative relationship between accounting risk and return. Most research (e.g., Fiegenbaum and Thomas, 1988; Bromiley, 1991a; Sinha, 1994) used reference-based models of choice based on the behavioral theory of the firm (Cyert and March, 1963) or prospect theory (Kahneman and Tversky, 1979). These models assumed managers decide on their risk preferences after comparing their firm’s performance to certain reference points, such as industry performance or their firm’s past performance. This focus on reference-based models largely ignored alternate explanations of managerial risk preferences. Therefore, prior models of risk may be mis-specified and results from prior risk research could be

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incomplete or erroneous. In particular, few studies of accounting risk-return relations have incorporated agency theory, which is clearly concerned with the risk choices of agents (Coffee, 1988; Barney and Hesterly, 1996; Gomez-Mejia and Wiseman, 1997). A major contribution of this research is that we incorporate agency theory into a model of risk based on the behavioral theory of the firm. Moreover, we find that the two theories have conflicting predictions on the effect of capital structure on risk.

A second contribution of this study is its examination of a theory-based explanation for how risk reduces return. The arguments linking higher risk to lower return in prior research have rested on traditional strategic management assumptions that choices of risk must play a significant role in performance. Although intuitively appealing, these arguments lack a strong theoretical foundation. We apply implicit contracts theory, which suggests that exchange partners accept less favorable contract terms from companies whose income streams are stable because stability lowers the default risk (Shapiro and Titman, 1986; Cornell and Shapiro, 1987).

This study’s third contribution is the examination of accounting risk-return relations in two time periods with distinctly different economic conditions. Fiegenbaum and Thomas (1986) and Wiseman and Catanach (1997) suggested that risk-return relations vary over time and that macroeconomic conditions may account for this variation. We test their speculation by estimating our model in two adjacent time periods that had dramatically different economic conditions. We develop three hypotheses from theory and also test for an overall structural change in all the coefficients between the two periods.

This paper is structured as follows. First, we develop hypotheses for risk and then for return. Second, we explain how we tested the hypotheses using a simultaneous equations model. Third, we present the results of our analysis. Finally, we suggest several ways to advance research on accounting risk-return relations.

2. Model of risk

Miller and Bromiley (1990) suggested three types of firm-level risk: income stream risk, stock market risk, and industry-strategic risk. We focus on income stream risk, the ex ante uncertainty about a firm’s future income, because it is the type of risk most relevant to managers (Libby and Fishburn, 1977; Fiegenbaum and Thomas, 1986). In contrast, stock market risk (e.g., beta) is most relevant to investors since it indicates how the stock market prices expected cash flows, but it does not address the generation of such cash flows. Industry-strategic risk, the least studied of the three, is thought to represent capital and R&D commitments that vary systematically across industries (Miller and Bromiley, 1990). Thus, our focus on income stream risk most closely captures the type of firm risk under the direct control of managers. Further, our ex ante measure of income stream risk specifically captures anticipated uncertainty at the time of managerial decisions and thus provides a better proxy of managerial propensity for risk than do ex post measures of income stream variability. Finally, our use of income stream risk allows our findings to be interpreted within the context of prior organizational risk-return research. The model of risk developed here applies the behavioral theory of the firm and agency theory.
2.1. Behavioral theory of the firm

Cyert and March’s (1963) behavioral theory of the firm proposes that a firm’s proclivity for risky searches depends on two factors, the gap between aspired performance and expected performance and the firm’s slack resources.

2.1.1. Aspirations–expectations gap

Early research examining the effect of performance on risk taking relied on a simple decision process linking performance and risk (e.g., Fiegenbaum and Thomas, 1986). More recent research has begun developing more complex processes involving aspirations and expectations. These concepts, which are functions of performance, are more cognitively salient to decision makers, based on empirical examination of individual decision behavior. We extend this work as follows. Aspirations act as adaptive firm goals that are modeled as a function of past performance, past goals, and the performance of referent firms, usually competitors (Cyert and March, 1963). The difference between performance aspirations and expected or forecasted performance (i.e., the aspirations–expectations gap) influences search behavior (Lant, 1992). When expectations for future performance exceed aspirations, there is little incentive to search for new routines, products, or markets. Conversely, when expected performance falls short of aspirations, firms search for new routines, products, and markets to achieve performance goals (Cyert and March, 1963). Firms with performance expectations well below aspirations will explore alternatives that are further from traditional solutions (Nelson and Winter, 1982). The role of routines in increasing predictability (March and Simon, 1958; Nelson and Winter, 1982), more radical changes should increase the uncertainty of a firm’s income stream.

There is indirect empirical support for this view. Lant and Montgomery (1987) found that decision makers in business simulations made riskier choices when actual performance was below aspirations. Bromiley (1991a) tested firm-level measures of aspirations and expectations separately and found that aspirations had a positive effect on income stream risk but expectations had no effect. Wiseman and Catanach (1997) combined aspirations and expectations into a single measure and found a positive influence on two operating risks managed directly by savings and loans. Consistent with the behavioral theory of the firm, we directly test the difference between aspirations and expectations on income stream risk. Specifically, we predict that larger positive gaps between aspirations and expectations increases income stream risk.

This prediction may hold only during economic expansions, but not in turbulent periods. March and Shapira (1992) argued that the reference point used in determining gain or loss varies with the focus of one’s attention. In munificent economic environments, most firms focus on achieving their aspirations. During periods of distress, a different, ‘failure’ reference point may become more salient. Since poor economic times negatively affect firm performance, we should find more firms focusing on avoiding failure than with achieving success during turbulent economic times. This shift in concern from success to failure should lead to greater caution and thus less risk taking as firm performance falls. Regarding our model, this argument implies a negative relation between the aspirations–expectations gap and risk taking during economic downturns. Combining our arguments, we suggest that firms with higher aspirations–expectations gaps are more likely to have lower income
stream risk during turbulent economic periods (H1a) but will have higher income stream risk during expanding economies (H1b).

2.1.2. Slack resources

Slack represents excess resources beyond those needed to maintain the organizational coalition (Cyert and March, 1963). Researchers differ on slack’s effect on risk. Some argue that slack provides discretionary resources that may be used for experimentation, innovation, and risk taking (e.g., Schumpeter, 1950; Mansfield, 1961; March, 1981). Others argue that slack allows a firm to postpone taking risky changes by acting as a buffer between environmental change and corporate response (Cyert and March, 1963: 38; Meyer, 1982; Sharfman et al., 1988; March, 1989: 4). Moreover, firms with low levels of slack take risks to create a buffer.

Our interpretation of the behavioral theory of the firm recognizes that both arguments may be true. Therefore, we suggest that an abundance of slack encourages experimentation, but a scarcity of slack forces firms to search for new solutions. In this way, slack represents both a discretionary resource to be used in experimentation and a measure of firm health (cf. Hambrick and D’Aveni, 1988). This argument suggests that slack exhibits a ‘U’-shaped relation with risk, such that high and low levels of slack correspond to greater risk.

Prior research has examined three types of slack corresponding to the availability of liquid assets (available slack), excess expenses (recoverable slack) and unused debt capacity (potential slack) (Bourgeois, 1981; Bourgeois and Singh, 1983; Singh, 1986; Bromiley, 1991a; Wiseman and Bromiley, 1996). These three types represent different degrees of accessibility. In general, we expect that moderate levels of each type of slack correspond to lower income stream risk, while both low and high levels of slack correspond to higher income stream risk (H2).

2.2. Agency theory

In most large corporations, ownership by stockholders is separate from decision control by managers. Agency theory examines the problems arising from the separation of ownership and control (Jensen and Meckling, 1976). One problem is the differences in risk preferences between principals and agents. Most research generally assumes that principals (shareholders) are risk neutral and agents (managers) are risk averse (Jensen, 1986; Coffee, 1988; Gomez-Mejia and Wiseman, 1997). This ‘risk differential’ arises because managers are over-invested in their firms relative to shareholders. Managers cannot diversify their firm-specific human capital investment (i.e., employment risk), but shareholders can diversify their capital investment (i.e., investment risk) (Beatty and Zajac, 1994). As applied to income stream risk, agency theory suggests shareholders prefer that agents accept all fully compensated risks because this maximizes income and ultimately shareholder wealth. On the other hand, risk averse managers prefer to forgo higher return investments in exchange for lower levels of firm risk because this lowers the agent’s compensation and employment risk. Corporate governance mechanisms generally are designed to reduce the risk differential between principals and agents by bringing agent preferences into line with those of principals. Using an agency theoretic framework, we examine two factors suggested in prior research, leverage and monitoring by the board of directors.
2.2.1. Leverage

Leverage is the amount of debt financing relative to equity financing used by the firm. Considerable empirical evidence supports a positive relation between the debt-equity ratio and risk. However, this research varies in both the type of risk examined and the motivation for this relation. Some studies used behavioral theory to link the debt-equity ratio, as a measure of potential slack, to income stream risk (Bromiley, 1991a; Wiseman and Bromiley, 1996). Other studies used an agency perspective to link the debt-equity ratio, as a measure of leverage, to market risk (Saunders et al., 1990; Sinkey and Greenwalt, 1991), stock price variance (Lev, 1974), and operational risks (Wiseman and Catanach, 1997). These studies argued that principals benefit from applying debt capital to riskier projects because the cost of debt is fixed while the upside potential from increasing risk is not (Jensen and Meckling, 1976; Barnea et al., 1985). Further, debt financing limits the exposure of equity owners in risky projects, while equity financing does not. In a study of thrift institutions, Wiseman and Catanach (1997) found that leverage exhibited a positive influence on operational risk. They interpreted these results to argue that greater debt financing leads agents (at the behest of principals) to invest in riskier (i.e., income variance increasing) projects that promise larger upside potential. This argument is justified if: (a) agents are insulated from down-side consequences of risky decisions and (b) agents share in the upside potential from risk taking through incentive alignment arrangements like stock option plans (Harikumar, 1996; Gomez-Mejia and Wiseman, 1997).

An opposing argument also can be developed within a normative agency view. If bankruptcy is personally costly to agents (Ross, 1977; Chung, 1989), then high levels of leverage may lower risk taking by agents because leverage increases interest expenses that place a greater burden on the firm’s cash flows. This burden increases the chances of negative cash flows and bankruptcy which ultimately corresponds to greater employment risk for the agent. Thus, leverage transfers risk on to the agent, leading them to become more risk averse.

One approach to resolving these two views is to formally recognize a role for economic context. That is, the influence of leverage on managerial risk propensity may be contextually bound such that increased leverage may encourage greater risk taking during munificent periods but greater conservatism during turbulent periods. This argument rests on two conditions. First, it is likely that most senior managers of larger firms operate under some form of incentive alignment compensation scheme that links some portion of pay to the achievement of specified performance targets and also provides some protection against down-side risk to compensation (Gomez-Mejia and Balkin, 1992). That is, executive compensation designs allow managers to share in the benefits of their risk taking on behalf of the firm. Further, these compensation schemes limit down-side exposure through various arrangements, such as restricted stock grants, repricing of stock options, and severance agreements (Gomez-Mejia and Balkin, 1992). Second, due to employment risk, managers are likely to be sensitive to the possibility of bankruptcy, but only when the possibility of bankruptcy is perceived to be non-negligible. For most firms, the threat of bankruptcy (or even negative cash-flows) should be negligible during munificent economic periods. However, turbulent periods should, on average, increase the chances of poor performance. For highly leveraged firms, poor performance should increase the threat of bankruptcy and thus employment risk for managers of those firms. Thus, we would...
expect leverage to correspond to greater managerial conservatism during turbulent economic periods.

In sum, to the extent that managers share in firm return, we would expect managers of highly leveraged firms to be more cautious during recessionary periods when the potential for negative cash flows is higher (H3a). Conversely, we expect managers to consider riskier investments with higher income potential and market returns during boom periods (H3b).

2.2.2. Monitoring by the board of directors

Agency arguments regarding the principal’s monitoring of agent behavior recognize both differences in risk preferences and differences in power relations between inside and outside directors. Monitoring is the direct supervision and review of agent behaviors by board members (Gomez-Mejia and Wiseman, 1997). A basic agency theory argument is that board members who are not managers (i.e., outsiders) should be better monitors for shareholders than board members who are managers (i.e., insiders) (Fama and Jensen, 1983). As noted above, insiders, including the CEO, are risk averse because they wish to protect their specific human capital investments in the firm by lowering firm risk. Conversely, risk neutral outsiders prefer higher risk strategies that maximize firm returns. Thus, inside board members are more likely to accept lower risk (and presumably lower return) strategies that outsiders would eschew.

A second monitoring issue concerns the differences between insider and outsider ability to influence managerial risk preferences. By definition, outsiders are not under the direct control of the CEO, whereas insiders are subject to both hierarchical and reward power exerted by the CEO (Mizruchi, 1983). This difference gives outsiders independence in controlling senior managers. Hence, we would expect that not only are outside board members more inclined to prefer risk neutral strategic choices, they also are more vigilant in guarding against managerial risk aversion. For example, Sanders (1997) found a negative association between the proportion of outside board members and attempts to reduce income stream variability through diversification strategies. This leads us to argue that firms with a larger proportion of outside board members should exhibit more risk-taking (H4).

3. Model of return

3.1. Behavioral theory of the firm

Because the behavioral theory of the firm does not indicate how the aspiration–expectations gap influences return, we address only the effect of slack.

3.1.1. Slack resources

As noted above, slack resources act as a buffer to external turbulence and as a reservoir for exploring available opportunities. In terms of performance, slack resources allow firms to buffer their technological core from variations in supply and demand (Meyer, 1982). This buffering lowers overall operational costs by allowing longer production runs and fewer costly start-ups or change-overs (Thompson, 1967). Slack also facilitates the search
for new income sources from new products and markets (Cyert and March, 1963). Both arguments suggest that slack resources have a positive influence on performance (H5a). Empirical research by Bromiley (1991a) supported this.

Prior research has also found that recoverable slack, conceptualized as excess expenses, has a negative influence on return for declining firms (Wiseman and Bromiley, 1996). This makes sense if we consider that this form of slack represents inefficiency (cf., Leibenstein, 1980) which can drain away positive return during a turbulent economy. Thus, we would predict a change in the relation between recoverable slack and return during turbulent economic periods. Specifically, we suggest that during a turbulent economy, the presence of recoverable slack may harm performance (H5b).

3.2. Agency theory

Shirking behavior by agents is another important concern of agency theory (Coffee, 1988; Beatty and Zajac, 1994; Gomez-Mejia and Wiseman, 1997). Shirking occurs when managers fail to put forth the level of effort that owners desire or when managers consume some portion of firm’s revenues as perquisites (Alchian and Demsetz, 1972; Jensen and Meckling, 1976). Failure to control agent shirking can reduce firm performance. Leverage and board monitoring have been suggested as two ways to control shirking and ultimately lead to higher return.

3.2.1. Leverage

Although agency-based models are generally consistent in specifying a positive relation between leverage and return (Barnea et al., 1985), these models vary in their motivation for this relation. One view is that leverage reduces the amount of ‘free cash flow’, the discretionary funds remaining after operating expenses and other commitments are met. This, in turn, reduces the amount available for managers to consume as perquisites and presumably increases returns to shareholders (Jensen, 1986). Another view is that leverage, since it places the firm’s future at greater risk, induces greater effort by managers who would be hurt by bankruptcy (Ross, 1977). Higher leverage puts a burden on cash-flows through higher interest expenses (higher fixed costs), which increases the likelihood of loss and ultimately the possibility of bankruptcy. Thus, for managers concerned about bankruptcy, leverage should encourage greater effort which should result in higher returns. However, Myers (1977) pointed out that as firms approach bankruptcy, managers may accept risky negative net present value projects to boost shareholder returns (ROE) at the expense of the bondholders. This suggests that increased leverage may lead to higher ROE but may not produce a parallel gain in ROA. Conversely, efforts to boost returns may be independent of managerial risk taking if it is focused on productivity improvements or cost savings which would enhance ROA. Since, our model controls for risk, we predict a positive influence of leverage on returns to assets while still allowing for a mixed influence on risk (H6).

Although several motivations for the positive influence of leverage on return are possible within an agency framework, it is not the purpose of this study to resolve the differences among them.
3.2.2. Monitoring by the board of directors

A goal of the board of directors is to reduce shirking, and thereby, increase return. Outside board members should control shirking better than insiders. Outsiders are in a better structural position to monitor managers due to their independence from the CEO’s authority (Mizruchi, 1983; Beatty and Zajac, 1994). Information asymmetry between insiders and outsiders leads outsiders to focus on measurable financial results (Baysinger and Hoskisson, 1990; Hoskisson et al., 1993). This attention should influence managers to focus on increasing return (cf. Zajac and Westphal, 1997). Hence, a greater proportion of outside board members should on average lower agency costs and increase return (H7). For example, Hill and Snell (1988) found that the proportion of outside directors was positively associated with firm return.

3.3. Default on implicit contracts

Many studies of risk and return found a negative relationship between them (Bowman, 1980; Bromiley, 1991a; Wiseman and Bromiley, 1996). This relationship has been explained by simply assuming risk should affect return. We do not find this theoretically compelling.

One theoretical explanation for a negative influence of risk on return rests on an ‘implicit contracts’ view. In particular, Shapiro and Titman (1986) and Cornell and Shapiro (1987) argued that variability in a firm’s return (i.e., income stream risk) increases the likelihood that a firm will default on either its explicit commitments (contractual arrangements with suppliers, buyers, employees, etc.) or its implicit commitments (mutual understandings or promises to the same). A high default risk results in both decreased revenues and increased costs. For example, if a buyer believes a firm may default on its explicit warranty commitment or its implicit commitment to maintain parts and service availability, the buyer will not buy from the firm unless the firm offers a sufficiently lower price. Similar arguments for suppliers and employees suggest that highly variable returns result in higher direct costs. Moreover, income variability can induce default on implicit contracts prior to bankruptcy because firms under financial pressure may restructure in ways that adversely affect stakeholders, such as selling a division. This argument suggests that as income stream uncertainty rises, it can harm return by signaling distress that results in a premium being paid to stakeholders for their continued patronage (H8a).

As firms approach bankruptcy, implicit contracts theory should have greater potency. That is, default is more likely, so stakeholders will require even larger inducements to contract with the firm. Thus, as firms approach bankruptcy, the negative influence of income stream risk on return should intensify (H8b).

4. Methodology

4.1. Sample selection and data sources

We tested the hypotheses in a sample of US manufacturing firms over the period 1973–1987. Restricting the sample to manufacturing firms avoids issues arising from differences in accounting procedures between manufacturing and service firms. Our 15-year sample
period overlaps the time periods used in prior risk-return research (e.g., Fiegenbaum and Thomas, 1988; Bromiley, 1991a; Wiseman and Bromiley, 1996). The sample period was divided into three 5-year periods. The earliest period (1973–1977) was the source of lagged dependent variables for the second period. The second period (1978–1982) was one of economic turbulence. Real GDP grew a total of 6.4% over the 5 years in the face of two recessions and high and volatile inflation and interest rates. In contrast, the third period (1983–1987) was one of strong economic expansion. Real GDP expanded a total of 20.7% over the 5 years, while inflation and interest rates were relatively low and stable.

The data were drawn from three sources. Standard and Poor’s COMPUSTAT database provided company financial measures. The institutional brokers estimate system (I/B/E/S©) provided stock analysts’ forecasts used to compute income stream risk and expectations. Standard and Poor’s Register of Corporations, Directors, and Executives (Standard and Poor’s Corporation, 1978, 1983) provided board of directors data.

The final sample consists of those companies and industries having complete data from all three sources. We used four criteria to select the COMPUSTAT sample. First, we eliminated firms with more than 2 years of missing data during a given 5-year period to minimize the influence of a few years on the period averages. Second, we removed all firms from any 2-digit SIC code industry with fewer than three firms to eliminate the possibility that a single firm’s measures would overly influence the industry measures. Third, we eliminated observations that had return on assets (ROA) in excess of 0.50 or less than −0.50 to prevent distortions due to outlying values (Judge et al., 1988; Bromiley, 1991a). Fourth, we dropped firms with more than one class of stock because of the difficulty in allocating COMPUSTAT financial data to different classes of stock. For the I/B/E/S© forecast sample, we removed firms followed by fewer than three analysts and those with fewer than 1/3 of the monthly forecasts available in a 5-year period to ensure adequate analyst coverage of the firm. For the board of directors sample, the firm had to have board of directors data for the first year of each period (i.e., Standard and Poor’s Corporation, 1978, 1983). The final sample sizes were 367 in Period 2 and 695 in Period 3.

4.2. Measurement

We measured a firm’s income stream risk using the standard deviation of analysts’ forecasts of earnings per share averaged over 5 years, an ex ante risk measure (Givoly and Lakonishok, 1988; Miller and Bromiley, 1990; Bromiley, 1991a). The value of ex ante versus ex post measures of income stream risk, such as the variance of accounting returns, has been debated (Rueffli, 1990; Bromiley, 1991b). Ex ante measures are preferred because they reflect anticipated uncertainty resulting from strategic choices made by the firm prior to the actual outcomes from those choices. In contrast, accounting measures indicate ex post uncertainty, the realized riskiness of the firm’s income. This may differ substantially from the anticipated uncertainty occurring before the period and may include unforeseen exogenous influences on income that occur after investment decisions have been made (Bromiley, 1991a). Further, ex ante measures distinguish between predictable variance (due to trend) and unpredictable changes in outcomes. For example, variance measures show rapidly growing returns as risky but stable or slightly declining returns as less risky (Cardozo and
Smith, 1983; Ruefli, 1990). Ex ante measures of risk also avoid confounding with tax and information effects (Miller and Scholes, 1972). Thus, our measure comes closer to capturing the intended risk of managerial choices at the time of decision, rather than an outcome measure which captures realized risk.

Both return on assets (ROA) and return on equity (ROE) have been used in risk-return studies. The two are highly correlated, and regression results using the two have been nearly identical (e.g., Bromiley, 1991a). We measured return using ROA averaged over each period.

We calculated the aspirations–expectations gap by subtracting the standardized measure of expectations from the standardized measure of aspirations on an annual basis and then averaging these values over each 5-year period. Expectations were measured using the average forecast of earnings per share across all stock analysts’ forecasts in the I/B/E/S© data base. Aspirations for a given year equaled the greater of industry average return for the prior year or the firm’s actual return in the prior year plus a 5% growth factor. Bromiley (1991a) used this measure of aspirations and found his results were robust to three different growth factors.

We measured the three types of slack following prior research (Bourgeois and Singh, 1983; Singh, 1986; Bromiley, 1991a; Wiseman and Bromiley, 1996). Available slack was measured with the current ratio, current assets divided by current liabilities. Recoverable slack was measured with the ratio of selling, general, and administrative expenses to sales (SG&A-sales ratio). Potential slack was measured using the ratio of debt-equity ratio because our sample contains firms with zero debt. Thus, this measure reflects the inverse of potential slack such that low levels of debt represent high amounts of unused debt capacity (i.e., potential slack). All measures are averaged over each 5-year period. In order to capture the ‘U’-shaped relation predicted between slack and risk, the slack measures were centered prior to squaring them (Aiken and West, 1991).

Leverage was measured using the debt-equity ratio as well, following prior research (Lev, 1974; Saunders et al., 1990; Sinkey and Greenwalt, 1991; Catanach and Brody, 1993). This measure thus represents two concepts proposed by different theories. Firms with larger debt-equity ratios are more leveraged but have lower potential slack. This measure produces competing predictions between the behavioral theory of the firm and agency theory, specifically, Hypotheses 2, 3a, and 3b for risk and Hypotheses 5a and 6 for return.

The proportion of outside members of the board of directors for each firm was measured by dividing the number of outside members by the total number of board members. These numbers were determined at the beginning of each period (i.e., Standard and Poor’s Corporation, 1978, 1983).

A firm’s proximity to bankruptcy was measured using Altman’s Z (Altman et al., 1981). This measure was created to evaluate the likelihood of default on one type of explicit contract, corporate bonds. We assume it is a reasonable proxy for default on other implicit and explicit contracts. In this study, Altman’s Z is multiplied by −1 so that larger numbers indicate greater proximity to bankruptcy.

Our control variables included lagged dependent variables to control for firm effects and contemporaneous industry risk and return to control for industry effects. We calculated industry measures at the 2-digit SIC code level. Industry risk for a given firm equals the average income stream risk of all firms in the industry excluding the selected firm. Industry return
for a given firm equals the average ROA for all firms in the industry excluding the selected firm. We expect the control variables to be positively related to the dependent variables.

4.3. Statistical model and estimation procedure

Our statistical model has two equations. The risk equation is:

\[
\text{Risk}_t = b_0 + b_1 \text{ Aspirations–Expectations Gap}_t + b_2 \text{ Current Ratio}_t^2 \\
+ b_3 \text{ Current Ratio}_t + b_4 \text{ SG&A-Sales Ratio}_t^2 \\
+ b_5 \text{ SG&A-Sales Ratio}_t + b_6 \text{ Debt-Equity Ratio}_t^2 \\
+ b_7 \text{ Debt-Equity Ratio}_t + b_8 \text{ Outside Board Members}_t \\
+ b_9 \text{ Industry Risk}_t + b_{10} \text{ Risk}_{t-1} + e_t. \tag{1}
\]

Hypothesized coefficients: H1a: \( b_1 < 0 \); H1b: \( b_1 > 0 \); H2: \( b_2 > 0 \); \( b_4 > 0 \); \( b_6 > 0 \); H3a: \( b_6 = 0 \) and \( b_7 < 0 \); H3b: \( b_6 = 0 \) and \( b_7 > 0 \); H4: \( b_8 > 0 \); control variables: \( b_9 > 0 \) and \( b_{10} > 0 \).

The return equation is:

\[
\text{Return}_t = c_0 + c_1 \text{ Current Ratio}_t + c_2 \text{ SG&A-Sales Ratio}_t \\
+ c_3 \text{ Debt-Equity Ratio}_t + c_4 \text{ Outside Board Members}_t \\
+ c_5 \text{ Risk}_t + c_6 \text{ Proximity to Bankruptcy}_t \\
+ c_7 \text{ Risk} \times \text{ Proximity to Bankruptcy}_t + c_8 \text{ Industry Return}_t \\
+ c_9 \text{ Return}_{t-1} + e_t. \tag{2}
\]

Hypothesized coefficients: H5a: \( c_1 > 0 \); \( c_2 > 0 \); \( c_3 < 0 \); H5b: \( c_2 < 0 \); H6: \( c_3 > 0 \); H7: \( c_4 > 0 \); H8a: \( c_5 < 0 \); H8b: \( c_7 < 0 \); control variables: \( c_8 > 0 \); \( c_9 > 0 \).

A simultaneous equations estimation procedure was used to test our hypotheses because risk and return may be jointly determined (Bettis and Hall, 1982; March and Shapira, 1987; Oviatt and Bauerschmidt, 1991). We used two-stage least squares (2SLS) to estimate the model. A consequence of using 2SLS is that R-squared statistics are subject to misinterpretation (Judge et al., 1988). A pseudo-R-squared was calculated by dividing the sum of squares due to regression by the total of sum squares due to error and sum of squares due to regression (SAS, 1993: 849).

Following Fiegenbaum and Thomas (1986), we tested if there was a structural change in the predictors of risk and return between the two periods. We applied the dummy variable method for regression (Gujarati, 1970). This method examines the differences in the coefficients between the growth period and the turbulent period. The statistic that tests if these differences as a set equal zero is distributed asymptotically as an F-distribution when using 2SLS.

5. Results

Table 1 presents results for the risk models. Column one presents estimates using data from the turbulent period. Column two presents estimates using data from the growth period.
As anticipated, both industry risk and the lagged dependent variable have significantly positive influences on risk in the turbulent period. Only the lagged dependent variable has a significantly positive influence on risk in the growth period.

Hypotheses 1 and 2 were derived from the behavioral theory of the firm. Hypotheses 1a and 1b predict the aspirations–expectations gap decreases risk in turbulent periods and increases risk in growth periods, respectively. There is a significantly negative effect in the turbulent period and a positive but non-significant effect in the growth period. These results support Hypothesis 1a. Hypothesis 2 specified 'U'-shaped relationships between three types of slack and risk. The squared terms for the current ratio, the SG&A-sales ratio, and the debt-equity ratio are non-significant in both periods, providing no support for this hypothesis.

Hypotheses 3 and 4 were developed from agency theory. Hypothesis 3 predicts that leverage decreases risk in turbulent economies but increases risk in expansionary economies. The linear debt-equity ratio is not significant during the turbulent period but is significantly positive in the growth period. These results support Hypothesis 3b. Hypothesis 4 predicts that firms having a larger proportion of outsiders on the board should have more risk. The coefficient in both periods is non-significant, so Hypothesis 4 is not supported.

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Table 1
Results of risk estimations dependent variable: standard deviation of earnings forecasts

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<td>1978–1982</td>
<td>0.071***</td>
<td>0.183***</td>
<td>−0.027***</td>
<td>0.008</td>
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Note: Standard errors are below coefficients in parentheses; ***p<0.001; **p<0.01; *p<0.05.

Table 2
Results of return estimations dependent variable: ROA

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>0.036***</td>
<td>−0.014</td>
</tr>
<tr>
<td>Avg. Industry</td>
<td>+</td>
<td>0.052</td>
</tr>
<tr>
<td>Return_t</td>
<td>(0.011)</td>
<td>(0.008)</td>
</tr>
<tr>
<td>Firm Return_{t−1}</td>
<td>+</td>
<td>0.514***</td>
</tr>
<tr>
<td></td>
<td>(0.072)</td>
<td>(0.053)</td>
</tr>
<tr>
<td>Current Ratio_t</td>
<td>H5a: +</td>
<td>−0.002</td>
</tr>
<tr>
<td></td>
<td>(0.003)</td>
<td>(0.002)</td>
</tr>
<tr>
<td>SG&amp;A-Sales Ratio_t</td>
<td>H5b: −b</td>
<td>−0.016*</td>
</tr>
<tr>
<td></td>
<td>(0.007)</td>
<td>0.017**</td>
</tr>
<tr>
<td>Debt-Equity Ratio_t</td>
<td>H5c: +</td>
<td>−0.015*</td>
</tr>
<tr>
<td></td>
<td>(0.007)</td>
<td>0.012***</td>
</tr>
<tr>
<td>Outside Board Percentage_t</td>
<td>H7: +</td>
<td>0.004</td>
</tr>
<tr>
<td>Risk_t</td>
<td>−0.083</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.070)</td>
<td>(0.018)</td>
</tr>
<tr>
<td>-Altman’s Z</td>
<td>H8a: −</td>
<td>−0.114</td>
</tr>
<tr>
<td></td>
<td>(0.197)</td>
<td>(0.185)</td>
</tr>
<tr>
<td>Risk×-Altman’s Z</td>
<td>H8b: −</td>
<td>0.284</td>
</tr>
<tr>
<td>Interaction</td>
<td>(2.873)</td>
<td>(0.869)</td>
</tr>
<tr>
<td>Sample Size</td>
<td>367</td>
<td>695</td>
</tr>
<tr>
<td>Pseudo-R-squared</td>
<td>0.657</td>
<td>0.489</td>
</tr>
</tbody>
</table>

**a** Standard errors are below coefficients in parentheses; ***p<0.001; **p<0.01; *p<0.05.

Finally, we tested for an overall structural change in the parameter estimates predicting risk between the two periods. The F-statistic from this test equaled 14.59 (d.f.=10, 1041; p<0.001), providing strong support for the view that economic conditions affect the influence of our model’s explanatory factors on firm risk.

Table 2 presents results for the return models. Column one presents estimates from the turbulent period. Column two presents estimates from the growth period. Lagged return has a significantly positive influence in both periods. Industry return has a significantly positive influence only in the growth period. Based on the behavioral theory of the firm, Hypothesis 5a predicts that available and potential slack have positive effects on return. Contrary to Hypothesis 5a, the current ratio has a negative coefficient in both periods, and it is significant during the growth period. The debt-equity ratio has a significantly negative effect in each period. Because this measure is reverse scored, this result provides partial support for Hypothesis 5a. Further supporting H5a, we find that SG&A-sales ratio has a significant and positive influence on ROA in the growth period. Finally, H5b predicted that during turbulent periods the presence of recoverable slack would harm performance. Consistent with this prediction, SG&A-sales ratio exhibits a negative relation to ROA during the turbulent period. Overall, these results provide some support for the proposition that slack influences performance and that recoverable slack’s influence on performance may be context specific.
Hypotheses 6 and 7 specify agency theory arguments. Hypothesis 6 predicts that leverage increases return. As described above, the debt-equity ratio is negative and significant in the both periods. These findings do not support the extension of agency theory arguments on leverage to accounting return. Hypothesis 7 predicts that firms with more outside board members will have higher performance. Coefficients in both periods are non-significant. Overall, hypotheses derived from agency theory do not apply to accounting return on assets in these periods.

Hypothesis 8a and 8b applied implicit contracts theory. Consistent with Hypothesis 8a, risk has a negative effect in both periods, and it is significant in the growth period. Hypothesis 8b predicts that the negative effect of risk is greater for firms nearer to bankruptcy. The interaction term between risk and Altman’s Z (reverse-scored) is non-significant in the turbulent period, but it is significant and negative during the growth period. The implicit contracts perspective is supported in the growth period.

Again, we tested for an overall structural change in the coefficients across the two periods. The F-statistic equaled 6.62 (d.f. = 9, 1043; p < 0.001), providing strong support for the view that economic conditions affect the influence of our theoretical predictors on firm return.

6. Discussion

Most research on accounting risk-return relations used reference-based theories like the behavioral theory of the firm. Although that research demonstrated the usefulness of reference-based theories, it did not consider alternate explanations. This study supplemented the behavioral theory of the firm with agency theory and implicit contracts theory. We also tested the models in two distinctly different economic periods, one characterized by turbulence, the other, by growth. Our study has many implications for future research, most notably the effect that economic conditions may have on risk-return relations and the importance of implicit contracts theory.

6.1. Explaining firm risk

In the risk model, our results provide some support for the behavioral theory of the firm predictions that the gap between aspired performance and expected performance decreased risk during the turbulent period. Conversely, the results from the growth period were in the predicted direction but were not significant. Our findings are reasonably consistent with past empirical research which found indirect support for a positive relation overall (Lant and Montgomery, 1987; Bromiley, 1991a) and direct support for a negative relation among poorly performing firms (Wiseman and Bromiley, 1996). Taken as a whole, these findings support March and Shapira (1992) suggestion of two reference points. As performance declines towards the failure reference point, firms switch from being risk-seeking to increase return, in the context of their success reference point, to being risk averse to avoid failure, in the context of their failure reference point. Thus, future research should investigate managerial formation of aspirations and expectations in different business contexts.

These findings also contribute towards resolving a debate between proponents of a hunger-driven search process (Bromiley, 1991a) and advocates of a threat rigidity perspective (Staw et al., 1981). Hunger-driven models predict that decision makers of under-
performing firms (firms failing to achieve their aspirations) take more chances than ‘successful’ firms. Conversely, threat-rigidity models predict that decision makers become more conservative as the chance of failure increases. If different economic conditions encourage a shift in decision maker attention between the success and failure referents, and thus a shift in risk propensity, it would explain why under-performing firms may exhibit hunger-driven search to improve performance during munificent periods and conservatism to avoid failure during turbulent periods.

Slack is another concept from the behavioral theory of the firm often included in risk-return models. We tested the composite prediction that firms with high slack use these resources to take risky experiments and that firms with low slack seek to restore resources by engaging in risk-laden searches to increase slack. None of the squared terms was significant, providing no support to this composite view.

Consistent with the agency argument presented above, leverage (debt-to-equity) has a positive influence on risk during the growth period. During the turbulent period, the relationship is non-significant. We speculate it was not significant for several reasons. First, inclusion of the squared term may have attenuated the linear coefficient. Second, the smaller sample size of the turbulent period may have reduced our ability to reach significance for smaller effect sizes. Third, extremely leveraged firms may be so burdened with debt payments that during economic turbulence they become risk averse to avoid default. This would also attenuate a generally positive relation. To test for this latter explanation, we examined the histogram of the debt-equity ratio and found a thin tail of firms with high levels of debt. If these firms exhibit greater risk aversion during economic turbulence, we would observe some attenuation of the overall relation between leverage and risk.

Given these concerns about leverage and the lack of clear results regarding the influence of slack on risk, we performed a post hoc estimation of the model. Our post hoc analysis integrated both behavioral and agency concerns about slack and leverage by dropping the squared slack terms from the model and deleting the 1% of the firms having the highest debt-equity ratios from the sample. The current ratio was non-significant in both periods. The SG&A-sales ratio in the turbulent period was negative and significant ($\beta=-0.128$; S.E. = 0.031, $p < 0.001$) but non-significant in the growth period. This suggests that recoverable slack allows a firm to postpone taking risky changes during turbulent periods (Meyer, 1982; Sharfman et al., 1988; March, 1989). The debt-equity ratio was positive and significant at the $p<0.10$ level in the turbulent period ($\beta=0.033$; S.E. = 0.020) and at the $p<0.02$ level in the growth period ($\beta=0.038$; S.E. = 0.016). This evidence provides stronger support for the agency view that leverage promotes risk taking. Since the debt-equity ratio is a reverse-scored measure of potential slack, these results also support the behavioral theory view that slack acts as a buffer rather than a pool of discretionary resources for taking risks. Future research should develop ways to compare behavioral theory of the firm and agency theory arguments concerning capital structure and risk.

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2 We also note that the post hoc analysis affected the coefficient for the aspirations–expectations gap in the growth period. This coefficient became positive and significant at the $p<0.05$ level ($\beta=0.018$; S.E. = 0.009), consistent with Hypothesis 1a. In other words, managers exhibit hunger-driven search during good economic times. Deleting highly leveraged firms from the sample may have eliminated firms close to default and thus firms more likely to refrain from risk.
In contrast to prior agency research (e.g., Hill and Snell, 1988), we found no support for the agency-based prediction that board composition affected risk. Three explanations arise for these results. The simplest is that boards, as representatives of shareholders, are more concerned with stock market risk than with income stream risk. A more complex explanation suggested by Baysinger and Hoskisson (1990) is that outsiders are more concerned with financial outcomes than with the strategic behaviors leading to those outcomes. Information asymmetry between insiders and outsiders leads outsiders to focus on measurable financial results while insiders, due to their familiarity with the business, focus more on evaluating managers’ strategic behavior since financial outcomes are only loosely coupled to those behaviors. A third explanation is that board composition is not a good indicator of actual monitoring behavior by outsiders. Board composition ignores the importance of incentives for outsiders to monitor the firm on behalf of shareholders (Jensen and Meckling, 1976; Fama and Jensen, 1983). For example, had we been able to control for outsider equity holdings, we might have observed a stronger relation. As Jensen (1993) noted, outsiders without strong equity stakes to justify their position on the board are generally beholden to the CEO for their position. Thus, coarse distinctions between inside and outside directors ignores possible interdependence between board members and the CEO (Wade et al., 1990). That is, evidence suggests that outside members appointed to the board during the CEO’s tenure are less effective at monitoring than board members appointed prior to the CEO’s tenure (Boeker, 1992). Although a variety of measures have been used to capture board monitoring, none are without limitations (Byrd and Hickman, 1992; Gibbs, 1993). Thus, future research should work to refine the concept and measurement of board monitoring if meaningful results are to be found.

6.2. Explaining firm return

The behavioral theory of the firm predicts that slack should enhance return because it serves as a buffer against environmental jolts and as a resource for exploiting new opportunities. Our results found modest support for this dual perspective on slack, with three of six coefficients supportive. Further, our prediction that during economic turbulence, recoverable slack may act as a drain on returns is also supported. This latter finding supports an ‘X-efficiency’ view of this form of slack (Leibenstein, 1980), whereby excess expenses may provide a source of resources for experimentation during munificent environments, but these excess expenses become detrimental to performance during turbulent periods. Contrary to prediction, available slack (current ratio) reduced return in the growth period. One explanation is that during economic expansion, firms who maintain higher levels of liquidity (by holding excess amounts of capital in non-performing assets like cash or cash equivalents) fail to take full advantage of the opportunities provided by the expansion. Conversely, higher performing firms may convert more of their liquid assets into productive investments during economic expansion. Overall, our study challenges an implicit assumption in prior research that all forms of slack exhibit similar effects on return. Our view of slack differs from prior perspectives in that it focuses on how slack could be used rather than on how accessible it may be to the organization (cf. Bourgeois and Singh, 1983). Differentiating slack in terms of its use rather than its accessibility may resolve inconsistent findings in prior research. Moreover, individual effects may be contingent on economic conditions.
As noted before, agency and behavioral theories disagree over how to interpret the debt levels of a firm. One agency view suggests that debt may encourage greater effort by managers concerned with bankruptcy and thus higher return (Ross, 1977)\(^3\). In contrast, the behavioral theory of the firm sees debt as a buffer insulating the firm from the external environment (Meyer, 1982). While our results appear to support the behavioral view, it is also possible that large amounts of debt simply put a greater drain on returns due to higher interest expenses. In extreme cases, excessive debt would lower bond ratings, further aggravating interest expenses. Disentangling these explanations will require more direct examination of managerial attitudes toward debt and how they use it across different conditions.

The proportion of outsiders on the board of directors had no effect on return. This contradicts both agency predictions and prior research which focuses largely on market return (Hill and Snell, 1988; Morck et al., 1988). As stated above, these results may reflect board preoccupation with market returns rather than accounting return, where market return is loosely coupled to accounting return. Alternatively, these results may indicate that board composition does not adequately capture board monitoring (Gibbs, 1993; Jensen, 1993).

Implicit contracts theory suggests that firm risk reduces performance because income stream variability signals potential default on its contracts with stakeholders. This leads stakeholders to either reduce their involvement with the firm or demand a risk premium that ultimately reduces the firm’s return. Results supported this perspective during the growth period. Moreover, proximity to bankruptcy exacerbated this effect implying that stakeholders may have more alternatives and find it easier to identify distressed firms during munificent periods. In general, our findings suggest that implicit contracts theory should be included in future studies of how risk influences return.

Finally, we tested Fiegenbaum and Thomas’s (1986) suggestion that risk-return relations differ across economic conditions. We found strong support for an overall difference between turbulent and expansionary periods. Moreover, we found some support for the effects of economic conditions on the aspirations process, leverage, and recoverable slack. Thus, future research could examine how different economic environments affect risk-return relationships.

7. Conclusion

This study provides preliminary evidence that a broader set of theoretical explanations for accounting risk-return relationships should be added to reference-based models of risk. Specifically, agency theory and implicit contracts theory are found to add important explanatory power to behavioral theory models of risk and return. Indeed, implicit contracts theory provides a theoretical rationale for the influence of risk on return missing from previous risk-return studies. Our results also suggest new ways of viewing slack resources. Specifically, by considering the use of slack rather than the accessibility of slack, improved

\(^3\) Note that other agency arguments consider the influence of leverage on managerial risk propensity which is assumed to influence return. Since we control for risk in our return model and model the influence of leverage on risk separately, our focus here is on how leverage may directly influence return which would seem to result from changes in managerial effort.
predictions for the influence of slack on risk and return are possible. Finally, exogenous economic conditions appear to affect the underlying theoretical explanations for accounting risk-return relations. Hence, future research should consider the influences of the broader economic context when modeling risk and return.

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