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THE VALUE OF CORPORATE RISK MANAGEMENT:

EMPIRICAL EVIDENCE FROM LARGE UK COMPANIES

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ABSTRACT

This paper attempts to explain why large UK corporations undertake risk management in order to control the impact of fortuitous loss. Empirical results are based on a postal questionnaire survey of 127 risk and finance managers selected from a sample of the 350 largest UK companies. Although the results confirm a widespread agreement on the importance of risk management, particularly in connection with risks affecting third parties, there is no apparent relationship between risk management objectives and the financial characteristics or operating environment of the firm. The inability to explain inter-firm differences in risk management practice suggests that such differences are due to variations in non-financial characteristics such as organisational culture and managerial behaviour.

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Introduction

The purpose of this paper is to explain why firms would wish to spend resources on dealing with the effects of fortuitous risk which might involve the possibility of asset damage, business interruption, employee injury, or third party liability. While several empirical studies have been undertaken to investigate the motives behind corporate insurance purchases (Mayers & Smith [1990], Davidson, Cross & Thornton [1992], Khang [1992], Doherty & Smith [1993]) little attention has been paid to analysing the use of other risk management devices. The main part of this study therefore reports the results of a questionnaire distributed to 127 large UK companies in Summer/Autumn 1993. As well as summarising the respondents' motives for the practice of risk management, we also attempt to discover whether these factors differ systematically across our sample according to the firms' financial and organisational characteristics.

The paper proceeds with a brief survey of the current literature. The methodology used for collecting the data is then addressed and summary statistics presented. The following section tests for differences between firms in their risk management objectives using data reduction and multiple regression techniques, and finds little evidence of any systematic relationship between the practice of risk management and firm organisation or performance. The final section offers a brief summary and some concluding remarks.

Why Firms Undertake Risk Management

Carter & Crockford [1974] suggest that risk management should be concerned with preserving the firm's assets from random unwanted events, in order to protect the assets of investors and maximise their return. However modern finance theory establishes that, in a perfect market, stakeholders can remove without cost the adverse effects of all firm specific risk through diversification. Doherty [1985] argues that since risk management deals mostly with the effects of firm specific risk, it represents a negative net present value project and is essentially redundant as a form of risk control. However Cassidy, Constand & Corbett [1990] have demonstrated that the equity value of a firm rises after planned increases in risk management expenditure were

announced to shareholders. Sprecher & Pertl [1983] found that large, firm specific, fortuitous losses decreased the value of a firm, providing further evidence that risk management may be a positive net present value project. Furthermore Nance, Smith & Smithson (1993) reported tenuous evidence that shareholders may benefit from the utilisation of corporate hedging, using arguments that could also be applied to risk management measures.

If risk management can help to reduce the transactions costs of bankruptcy and financial distress, its presence should increase the value of levered equity. While some argue that the costs of bankruptcy are either non-existent (Miller [1977]) or at worst very small (Haugen & Senbet [1988]), the same is not the case for financial distress. Firms in financial distress face numerous costs: new capital is likely to be unavailable or at best prohibitively expensive; skilled employees may leave in search of a more secure job, suppliers will refuse to provide process specific inputs and consumers may be reluctant to purchase their products. If risk management can reduce the risk of financial distress, its presence will be of value to shareholders, even when the actual cost of bankruptcy is low (Shapiro & Titman [1985]).

In practice, firms are composed of diverse interest groups, each of which invests some type of asset into the enterprise (labour, capital) in return for some form of compensation (wages, dividends etc). Contrary to the assumptions of the capital asset pricing model, real world markets are far from perfect and, where markets fail, many of these stakeholder groups will be unable to remove the effects of certain theoretically diversifiable risks without incurring unacceptably high costs. If stakeholders cannot create a mean variance efficient portfolios, their discount rate will be inflated by the presence of unsystematic risk, causing the market value of the firm to fall. Thus shareholders may value risk management which deals with the effects of unsystematic risk, if it can help to protect or even increase the mean cash flows of a company. For example, a firm which reduces its labour costs by lowering the risk of employee injury or increases revenues, by providing a safe and environmentally friendly product should, if such plans are cost effective, raise shareholder dividends and hence the value of its equity.

Human capital is largely non-diversifiable and employees find it hard to remove the adverse effects of physical injury and redundancy. Employees who are exposed to such risks are likely to require some form of compensation and may demand higher wages (Viscusi [1993]), lower their productivity, leave their company, or sue their employers for negligence in the case of physical injury. In addition, violation of health and safety regulations may involve the imposition of fines

on the firm and other penalties on senior management (such as imprisonment or removal from office). Risk poses particular problems in those occupations which may involve large scale long-term hazards (Ringleb & Wiggins [1990], [1992]; Barney, Edwards & Ringleb [1992]) since employees may be ill-informed of their exposure to workplace risk. In such cases, misplaced employee risk perceptions may lead to substantial problems in the labour market which can, in part, be managed by the provision of information on job risk and other measures to reduce adverse ("dread") reactions to the risk involved (Gegax, Gerking & Schulze [1991]).

Consumers are exposed to the risk of physical injury if a product malfunctions and possibly financial loss if the firm is unable to honour product guarantees or provide continuity of supply. If risk management can help to improve product safety, the desirability of a firm's products should rise leading to an increase in demand (Viscusi, Vernon & Harrington [1992]). Improved product safety will also help a company to avoid costly liability suits and/or product recalls, both of which may harm future sales (Bromiley & Marcus [1989], Borenstein & Zimmerman [1990]).

Environmental pollution can affect third parties who have no direct economic relationship with a firm. Pollution represents a significant cost to society, both financially (cleanup costs, decline in property values) and physically (injuries, latent illnesses). Even though third parties have no direct economic relationship with a polluting firm, they *can still* influence its decisions through the use of government agencies, pressure groups and their power as potential consumers. As a result, firms may find it profitable to internalise the costs of pollution, benefitting in terms of reduced regulatory and legal liability costs and increased public goodwill. The incentive to avoid regulatory and legal liability costs is made even greater, due to the fact that such legislation is ever changing. Uncertainty with respect to the future legal environment should encourage firms to play it safe and ensure that they not only comply with current but also any anticipated new regulations (Viscusi, Vernon & Harrington [1992]).

Risk management may also be able to help a firm reduce it's debt interest payments. The shareholders of firms in possession of outstanding risky debt may possess an incentive to transfer wealth from bondholders to themselves by choosing to invest in high risk projects (Jensen and Meckling 1976) and in passing up certain discretionary investments (Myers 1977) which would only be of value to bondholders. However bondholders are likely to be aware of shareholders' incentive to expropriate their wealth and will increase interest charges to compensate. Naturally if shareholders are forced to bear the costs of their own opportunism they possess an incentive

to reduce it. Risk management is one possible solution to the debt agency cost problem, lowering a firm's cost of debt capital by reducing the risk that a large fortuitous loss may cause insolvency.

Despite the inability of other investor groups to diversify away the effects of unsystematic risk, it is usually assumed that shareholders can achieve mean variance efficient portfolios, however they may still gain value from risk management. No matter how well diversified shareholders are, their investment decisions will be influenced by systematic risk, which is a measure of the degree to which the cash flows of one company to move in conjunction with those of others. Investors cannot remove the adverse effects of systematic risk through diversification and consequently, the more systematic risk a firm is exposed to the lower will be the value of its equity. Risk management may also, by reducing pre-tax profit fluctuations, help a firm to reduce its tax liabilities (Mayers & Smith [1982 & 1990], Main [1983]).

Although most fortuitous risks are unsystematic in nature, there may be some which will affect the cash flows of several firms simultaneously (for example earthquakes, floods and storms, loss of consumer confidence) and are therefore systematic in nature. Where a firm is exposed to the risk of a systematic fortuitous loss, the practice of risk management should lower the discount rates of shareholders - even in a perfect market.

Methodology and Descriptive Statistics

The empirical analysis is based on a postal questionnaire survey of 127 risk and finance managers from a sample of the 350 largest UK companies. Identical questionnaires were sent to the risk manager and the finance manager of each company; double replies were received from only five companies. Following detailed discussions with practising risk managers, the questionnaire was trialed in April 1993 and then circulated in June - around 96 replies were received. A reminder despatched in early September (with a second copy of the questionnaire) produced a further thirty one responses. A full copy of the questionnaire is available on request. Sample firms were selected on the following criteria: firms had to be in the top 350 in the Times Top One Thousand 1992-1993 listings; they had to be listed on the FAME database; and banks, insurance underwriting, insurance broking and other financial companies were excluded. A description of the characteristics of sample firms is provided in Table 1.

Table 1 about here

The questionnaire sought to collect data on a variety of control variables relating to the personal

characteristics of respondents. Managers were asked questions relating to their job description, qualifications, pay structure, and level of experience. Respondents were also asked questions on their risk attitudes, including a description of the most suitable level of insurance cover for their own possessions and their company's assets (scored from 1 = Wholly Insured to 5 = Wholly Uninsured), whether they saw themselves as being more or less of a risk taker than their senior management (scored from 1 = Less to 5 = More). Finally respondents were asked whether, in comparison with senior management, they were more or less likely to consider the long term impact of company investment decisions (scored from 1 = Less to 5 = More). The replies to this section were summarised in Table 2.

Table 2 about here

The main purpose of the questionnaire was to discover why firms spend money on risk management. A number of questions were posed, which investigated the role of risk management in controlling the impact of risk on a company's main stakeholders: employees (in relation to physical risk and the risk of redundancy), consumers, the external environment, creditors, and shareholders. Respondents were asked to express, on a scale of 1 (unimportant) to 5 (important), how important they thought their company's risk management programme was in helping to achieve a variety of corporate objectives in relation to the various stakeholders. A summary of the responses is provided in Table 3.

Table 3 about here

Of the reasons for undertaking risk management listed as "Important" in Table 3, respondents placed most emphasis on ensuring statutory compliance with government regulations, governing such matters as employee health and safety (84.0%), product safety (80.2%) and environmental safety (74.0%). Firms also seem to practice risk management in order to limit possible legal liabilities to employees (81.8%), consumers (81.8%) or the environment (via damage to the firm's public image - 82.3%). Thus the main purpose of risk management seems to be the avoidance of contractual, tortious or statutory liabilities: a rather negative rationale!

There is some evidence that risk management is practised in order to bring direct benefit to the firm's shareholders via reductions in systematic risk (described as large scale disasters whose impacts are difficult to diversify away) which 65.6% of respondents ranked as important (4 or 5).

and by avoiding the costly effects of financial distress and/or bankruptcy (60.0%) thus partially supporting the propositions of Myers [1977] and Mayers & Smith [1987]. However there is little evidence that risk management is utilised to reduce a company's tax burden (contrary to Main [1983]) or to reduce the firm's cost of debt capital (contrary to Davidson, Cross & Thornton [1992]).

A series of cross-tabulations and tests of association failed to demonstrate any significant differences between respondents according to characteristics described in Tables 1 and 2.

Finally a factor analysis was undertaken in order to explore the underlying patterns or relationships between the various motivations listed in Table 3, and the results are summarised in Table 4. The extraction method utilised principal components analysis with the oblique factor rotation method which derived three inter-correlated factors together explaining over 58% of the cumulative variance of the variables under analysis.

Table 4 about here

Table 4 reports the loadings for the three factors on each on the main motivations for risk management. The loadings can be interpreted as weights which reflect the unique variance each factor contributes to the original variables, and are the key to understanding the meaning of each factor. The results shows that the various reasons for undertaking risk management can be divided into three main groups: controlling the negative impact of the firm on its external environment, reducing costs associated with employment, and providing direct benefits to shareholders. Factor 1 (which accounts for 40% of the cumulative variance) loads most heavily on those variables concerned with the impact of risk management on the external environment (including liability to employees). Factor 2 loads most heavily on those variables concerned with employment costs, turnover and productivity and explains 10.8% of the cumulative variance. Factor 3 obviously reflects the utilisation of risk management in maintaining or increasing dividends to shareholders and in reducing the costs of financial distress (explaining 7.5% of the cumulative variance).

Does Risk Management Depend on Firm-Specific Characteristics?

In this section we attempt to discover the extent to which the various risk management objectives (as described in Tables 3 and 4) can be explained by variations in the firm's financial performance and industry structure, and/or by the personal characteristics of the respondents. Table 5 reports

the results of a ordinary least squares estimation using as dependent variables the *sum* of respondent scores in *each* main category of Table 3. List-wise deletion of missing values and the removal of one of the replies in the case of the five firms with double response, restricted the sample size to around 104 separate firms.

The explanatory variables in the regression models used a mixture of questionnaire data on the personal characteristics of the company risk or finance manager (summarised in Table 2) and company data for the 1992 accounting year from the CD-ROM database FAME. Company size was measured by "Turnover" in £million and profitability by the ratio of profit before tax to sales ("Profit Ratio") and the return on shareholders' funds ("Return"). "Capital Intensity" was calculated using the ratio of net tangible assets to the number of employees: labour intensive firms should possess an incentive to reduce the costs associated with both the risk of physical injury and redundancy. "Diversification" was estimated by summing the total number of SIC codes in which a firm operated. "Risk" was measured using the standard deviation of percentage returns on a firm's shares (non-quoted companies were allocated the industry equally weighted average score) using data kindly supplied by the London Business School Risk Measurement Service. The type and level of risk inherent in an industry could influence how much firms spend on risk management to reduce the risks of employee, consumer and third party injury: two dummy variables were therefore included to pick up firms included in the FT Actuaries sector under Capital Goods or Oil & Gas ("Capital Goods Dummy") or under the Consumer Group sector ("Consumer Group Dummy"). The firm's "Gearing Ratio" (defined as the ratio of long-term liabilities and bank overdrafts to share capital and reserves) was included to measure the firm's exposure to debt and the risk of financial distress, since Chung [1993] argues that there is a positive relationship between a firm's gearing level and the agency costs of debt.

Table 5 about here

The limited statistical significance of the cross-section estimations in Table 5 allow only tentative conclusions. In fact, only Models D (External Environment, significant at 24% level), E (Creditors, significant at 25% level) and F (relating to risk management objectives focused directly on shareholders, significant at 5% level) demonstrated reasonable explanatory power. There are, however, a number of interesting issues arising from the OLS estimation:

(i) The firm-specific variables (most of which were financial in nature) appear to have very