

Final Report

Does explicitly formulated corporate risk management increase the value of the company?



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Abstract

This paper examines a facet of a highly discussed subject in finance: the relationship between a company's risk management and the value of the firm. Especially since the subprime crisis of 2007-2010 risk management has become the subject of renewed interest. We have examined 4 different measures of the value of a firm, some more subjective, like the P/E ratio of a firm, others more objective, like the net income relative to revenues. These 4 measures have been taken into linear regression against 3 independent variables, which measure the extent of *publication* about risk management. Expected was that these forms of publication can generate positive reactions from stakeholders and customers, thereby increasing the value of the firm.

Results show that all models are able to predict the value of the firm. Most extraordinary and contrary to expectations has been the finding of a highly significant negative relationship between the percentage of an annual report dedicated to risk management and the value of the firm. This might be explained by a reverse cause- and effect relationship. All other main independents are not significant, except for the less significant relationship between amount of "risk" mentioned in the annual report and relative profits.

Conclusion is that some strong signals arise about a possible negative relationship between publication on risk and a firm's value. Important are the various assumptions made (such as causality relationship) and the softness of the "risk management" concept, which makes it difficult to determine usability of the proxies used.

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Introduction

In recent years the discipline of risk management has made significant progress. Rating agencies, activist institutional investors and the Sarbanes-Oxley standards for corporate governance have put pressure on the way firms manage the different types of risk (Gates, 2006). The traditional practice of risk management focused on financial, legal and insurance risk. Recently, a growing amount of firms are adopting the practice of Enterprise Risk Management (ERM). This practice of risk management is defined by the Committee of Sponsoring Organizations of the Treadway Commission as: "A process, effected by an entity's board of directors, management and other personnel, applied in a strategy setting and across the enterprise, designed to identify potential events that may affect the entity, and manage risks to be within its risk appetite, to provide reasonable assurance regarding the achievement of entity objectives."

Whether risk management occurs in the form of ERM or not, the handling of risk is perceived as important in today's financial markets. Much research has been done on how certain types of risk management influence a company's value, as well as other effects of these practices. These results are mixed, but seem to hint toward a positive effect of risk management. This might be explained from both rational factors, but also from the psychological effects that risk management (or as it is perceived) has on revenues and profits. This research therefore tries to go beyond the existing work of scholars on risk management. This research focuses namely on the mere question of risk management practice, and focuses on risk management *publications*.

In this research, we have concluded that publication of a firm's risk management is negatively correlated with the company value. There could be several reasons for such a correlation but the most remarkable reason can be that stakeholders, confronted with an emphasis of the annual report on risk management, and publications about risk management in general, perceive this as negative.

This paper consists of 5 main sections. In the first section, we discuss the existing literature in the field of risk management and firm value followed by a description of the data used for our

empirical study. After the data description we go over the research methodology after which we present the results and summarize our main conclusions.

Theoretical foundation

Firm value

According to the current financial theories, the value of a firm can be calculated by several methods. One of the most-used, most acclaimed methods is the Net Present Value (NPV) method. This method discounts the present and future cash flows of the company to a present value:

$$NPV = \sum_{t=1}^N \frac{CF_t}{(1+i)^t}$$

Where CF stands for the free cash flows of the company, and i stands for the firm's discount rate. This calculation can be done on a company basis, but also on the basis of a project and its characteristics.

The discount rate is defined as the rate of return of an average investment in the market with the same risk profile as the investment that is subject of the NPV method.

The Capital Asset Pricing Model (CAPM) can explain the height of the discount rate (see Treynor 1961,1962; Sharpe 1964; Lintner 1965; Mossin 1966)

This model and the theory that comes along predicts that the expected return on a company's stock or any other investment is dependent on 2 things:

1. The difference between the (average) premium of the market as a whole and a risk-free investment.

2. The investment's Beta; the relationship between the return on the market and the return on the investment.

In a formula, the expected return is calculated as follows:

$$E(R_i) = R_f + \beta_i(E(R_m) - R_f)$$

According to this theory, risky investments should generate a higher expected return, to compensate for the riskiness.

Value of risk management

From a NPV perspective, risk management theory indicates that risk management might enlarge the value of the firm in two ways:

- Free Cash Flows can become larger
- The discount rate becomes lower

Rise of the amount of *free cash flows* can occur in several ways:

- More money can be led to those investments that generate the highest return. A stabilization in cash flows due to risk management makes it possible to keep investments in place, instead of having to abandon these in case money is needed.
- Better tax policy is possible due to better prediction of cash flows.
- Financial distress costs can become lower; the risk of going into bankruptcy becomes much smaller, thereby saving on costs to prevent this event.
- Customers have more trust in the company; high-maintenance products and products that need spare parts or equipment which can only be delivered by the company will only be bought in case there is a very big chance the company will still exist a few years later. This can increase cash flows.

- Risk premiums on the interest paid over debt will be lower due to a lower risk; this reduces the cost of lending.
- From the same last argument: internal generated money is cheaper than money acquired from outside the company. This increases free cash flows.

Furthermore, the *discount rate* becomes lower when a company is faced with less risk; the discount rate is the average return on an investment that is *as risky*. When an investment is less risky, the average return will become lower due to CAPM theory, thereby lowering the discount rate. Thus, risk management is predicted to beneficially affect the NPV of a firm.

The value of risk management in well-functioning markets

Effective risk management helps company in many aspects, but does it help really help to increase shareholders' value? Shareholders have the opportunity to diversify their portfolios and manage their own risks. Charles Smithson, in the Morgan Stanley roundtable on Enterprise Risk Management and Corporate Strategy, pointed another perspective of risk management effects on value creation for shareholders. He stated, "*The basic message of CAPM is that the stock market itself is an incredibly powerful and effective risk management device. The ability of investors to hold diversified portfolios has the effect of reducing the corporate cost of capital to the point where, at least according to the CAPM, the only risk that investors need to be paid to bear is so-called "market" risk. That is, a stock's market risk, or its beta, is all the investors care about when setting the stock's required rate of return.*" (Anderson, 2005) According to the Modigliani-Miller theorem (Miller and Modigliani, 1958), companies do not increase their value by using hedging instruments. Individual investors can also buy these instruments if they are concerned about the certain risk factors for firms. A big assumption here is the presence of a well-functioning market.

Like capital structure and dividend choices, risk management decisions are just different ways of dividing up the firm's operating cash flows and repackaging them for investors. In well-

functioning markets, this repackaging function should not add significant value because investors can do most of this repackaging on their own.

With respect to the above theoretical settlement, the risk management activity of a company can create value only in 3 ways; one possibility could be reduction in total taxes paid, another alternative could be reducing transaction costs and lastly risk management can help managers to better invest on all positive NPV projects, without having to close them down due to unexpected cash outflows.

Furthermore, in line with Modern Portfolio Theory, investors can diversify to their own taste of riskiness. Every possible combination of a risk-free asset and the market portfolio can be generated to take on the amount of risk wanted.

The value of risk management with imperfect market conditions

Volatility can be costly for firms with u-shaped tax functions. Take for example a firm that expects equally likely to make a € 50.000 profit or a € 50.000 loss. If the tax on profits is 25 %, the firm expects to pay € 6.250 in taxes. If the firm would be able to eliminate the volatility in income by hedging, income and taxes would be 0. This example provides a tax advantage to hedge; however it does not take into consideration the different tax codes which make it possible to carry losses forward.

Reducing the volatility in income and/or by reducing the probability that a firm gets into financial distress increases the debt capacity. Firms can therefore increase debt levels, which increase interest payments, and benefit from the reduced tax liabilities. This tax shield benefit increases the value of the firm. This has been empirically proven by Stulz (1996) and Ross (1997). Additionally, Leland (1998) states that hedging can increase firm value through two channels. Firstly, lower volatility allows higher debt levels which result in tax benefits. Secondly, unused debt capacity results in lower expected default rates which have a positive influence on firm value.

Hedging reduces the underinvestment problem that comes from deadweight costs caused by external finance. This is especially important for those firms with valuable investment opportunities, i.e. high growth firms. Hedging can avoid those left-tail outcomes that force firms to circumvent positive NPV projects. Thus, hedging gives the firm the opportunity to finance valuable investment projects and thereby increase the value of the firm.

Due to information asymmetries between managers and shareholders, firms should hedge based on private information which cannot be conveyed to shareholders without costs (Breedon and Viswanathan, 1998). From this follows that high-performing managers have incentives to hedge away uncertainties that exist about their performance. This is done by managers in order to give the markets the ability to better evaluate the performance of managers.

Importance of Risk Management

According to Slywotzky and Drzik (2005) more and more companies are getting better at managing operational and financial risks. However, only few managers are taking into consideration the strategic risks that a company faces. Even though when it is clear that these risks can be a more serious cause of value destruction than some of the operational and financial risks. ERM takes a company-wide approach towards risk management which explicitly incorporates risks in the corporate strategy (Slywotzky and Drzik, 2005).

Company wide risk management improves the internal organization of a firm

Gates (2006) designed an exploratory survey of ERM practices. 271 financial and risk executives in member companies of The Conference Board participated in this survey. The author found that full implementation of ERM has several benefits for the organization. First of all, the organizations experience an improvement in the decision making process. This is due to the fact that articulating risks improves the decision that management takes. Secondly, firms that implement ERM experience greater management consensus on the exact nature of key company-

wide risks. Lastly, ERM helps leaders to improve the communication of their understanding of the firm's major risks to rating agencies and shareholders. Gates (2006) concludes his work with the statement that the focus within firms should be more on strategic risk. The impact of this type of risk on the firm is higher than traditional sources of risk. Since ERM gives management a better understanding of strategic and operating risk, companies that implement ERM face less challenges.

Impact of risk management on firm value

Nocco and Stulz (2006) explain how enterprise risk management increases the market value of the company. According to the authors this happens at the macro and the micro level. ERM also helps firms determining the right amount of risk. At the macro level ERM creates shareholder value in two ways. Firstly, hedging against adverse cash flows decreases the risk that a firm has to alter its strategy. Adverse cash flows have a deadweight cost, i.e. costs that go beyond the loss of the cash flow's itself. Such a cash flow shortfall could result in firm forced to cut back on investment plans or raise funds externally. This increases the cost of capital, which means that firms have to give up some of the positive net present value projects, which makes it harder for the company to reach its strategic goals. Secondly, some risks cannot be hedged cheaply by others parties. These types of risks cannot be laid off profitably in capital markets or other markets developed for exchanging risks. An example is given for a firm that expands its business. This firm knows the risks from expansion better than anybody else and therefore, due to this information asymmetry, potential counterparties will charge higher prices for the hedge. The authors state that firms should make sure that they reduce the exposure to the risks that are not unique to them. Doing this gives firms the ability to focus on those core business risks that are difficult to hedge. The authors also indicate that explicitly formulating risk management increases the value of the firm due to benefits at the micro level. These benefits are related to the cultural transformation within a firm as a consequence of implementing ERM. In such an organizational culture every risk owned by a corporation's employees and this risk also effects the performance evaluation of employee's. Furthermore, the authors state that operational risks, in contrast to financial risks, typically cannot be hedged. Individuals within a firm that are

closest to specific risks are the most capable in assessing how the firm can reduce the exposure to these risks. With regards to the right amount of risk, the authors state that firms face a tradeoff between equity and risk. Having a buffer stock of equity is expensive. Therefore, by reducing risk a firm can lower this buffer stock. ERM quantifies the tradeoff between equity and risk, and enables the firm to optimize this tradeoff.

Stulz (1996) also comes to the conclusion that some companies can have a competitive advantage by hedging some risks, while deciding to take on the risk of some other activities. The same kind of conclusion can be deducted from the work of MacMinn (1987).

Smithson and Simkins (2005) reviewed thirty years of academic research to determine whether risk management adds value. The authors concluded that managing risks can enable companies to capture those important investment opportunities. Smithson and Simkins' paper gave us a clue about recent empirical studies about risk management and firm value. Conclusions of all these empirical studies are giving us 2 totally different perspectives. On one side it is stated that risk management does not have any or a positive influence on firms' value and on the other side it is stated that risk management certainly has positive influence on firm value.

Risk management reduces volatility of cash flow; the question then is: does reduction in the volatility of cash flow increase the value of company? We have examined 3 researches in literature to find an answer to this question. Minton and Schrand (1999) found that companies with higher cash flow volatility had lower capital expenditures, R&D, and advertising expenditures, thereby establishing the tie between volatility and lower investment. Allayannis and Weston (2003) found a negative relationship between earnings and cash flow volatility and between cash flow volatility and shareholder value (as measured by price-to-book ratios) after examining 2,000 firms. Shin and Stulz (2000) reported much the same result in their study of companies from 1962-1999.

In his comprehensive review of positive theories and their empirical evidence regarding the contribution of corporate risk management to shareholder value, Bartram (2000) is stating that hedging could increase shareholder value in several ways. First of all, through reduction of agency cost hedging can eliminate underinvestment and asset substitution problems. Secondly,

transaction costs can be reduced with hedging by lowering the bankruptcy risk. Thirdly, risk management at the firm level represents a means to increase firm value to shareholders in the presence of a convex corporate tax regime, because the average tax burden is lower for less volatile pre-tax income.

Effect of derivatives on firm value

Allayannis et al. (2001) researched the impact of foreign exchange derivatives on 720 large companies between 1990-1995 and concluded for a positive relation between the use of FX derivatives and firm value (Tobin's Q). Cyree & Huang (2004) researched the impact of interest rate and FX derivatives use by publicly traded banks or holding companies (1993-96) and also concluded that banks using derivatives have higher value (Tobin's Q) than non-users. Bartram, Brown and Fehle (2004) researched the impact of interest rate and FX derivatives use for 7,292 companies in U.S. and 47 other countries (2000-2001) and they concluded that the use of derivatives was associated with higher firm value (more significant for interest rates than FX). Carter, Rogers, & Simkins (2006) searched the impact of fuel hedging on 26 U.S. airlines (1994-2000) and they concluded for a positive relation between use of fuel price risk derivatives and firm value.(Tobin's Q). Nain (2004) conducted a research with a sample of U.S. firms (548 derivatives users and 2,711 non-derivative users) with ex ante FX exposure (1997-99) and he concluded that FX risk management increases firm value as measured by Tobin's Q if many competitors hedge. One of the most recent researches about this question is made by Allayannis, Lei and Miller (2009). They researched the impact of use of FX derivatives on firm value (Tobin's Q) for 379 firms (1990-99) and they have concluded that there is significant positive premium for users of derivatives with FX exposures (positive but insignificant for firms with no exposure).

Does hedging always increase firm value?

Until now all researchers concluded with the positive sides of risk management. We need to look at the other side of the medallion as well. There are some researches which are stating that risk management is not adding any value at all to the companies. All these researchers studied the effect of commodity derivatives (gold, oil and gas). Callahan (2002) investigated the impact of gold hedging on 20 North American gold mining firms (1996-2000) and he found a negative correlation between the extent of gold hedged and performance of firm stock prices. In his research, Lookman (2004) examined exploration and production (E&P) firms that hedge commodity price risk; unbalanced panel set of 125 firms (364 firm-year observations) (1992-94 and 1999-2000). They concluded that for undiversified E&P firms where commodity price risk is a primary risk, hedging is associated with lower firm value. For diversified firms with an E&P segment, hedging is associated with higher firm value. In aggregate, no association with hedging and firm value is detected. Most recent research is made by Jin and Jorion (2004), they have studied the hedging activities of 119 U.S. oil and gas producers from 1998-2001 and concluded that, while hedging reduced the firm's stock price sensitivity to oil and gas prices, it did not appear to increase value.

Risk management and communication

Tufano (1998) argued that managers can use cash flow hedging instruments for their self interest and this situation, as part of agency cost, affects shareholder value. These costs require shareholders to understand the risk management process. If we take this argument as a starting point, then, if companies really want to benefit from the risk management, they need to communicate their risk management in an explicitly formulated way.

Research question

This research aims to determine the relationship between explicitly *formulating a company's risk management*, and the effect on the value of the firm. There is a reason why this research focuses on the effect of publication, and not just on the practice of risk management itself: applying risk management may not be enough to increase shareholder value.

Companies should be able to communicate their risk management activities with investors. In the Morgan Stanley roundtable on Enterprise Risk Management and Corporate Strategy (Anderson, 2005), Joe Sullivan, the Vice President and Treasurer of Airgas, is stressing how crucial communication about risk management is in his following statement: *“Although we manage our interest rate exposure so that our bundle of derivatives provides an effective hedge for our bundle of debt instruments, it would be difficult for an investor to confirm that just from our GAAP statements. But we provide a significant amount of additional information in our press releases, on our conference calls, and in the MD&A section of our SEC filings. So, even with all the complexity introduced by fair value accounting, the analysts who take the time to read our accounts and our supplemental disclosures will understand that the fundamental purpose of our derivatives use is to transform our debt so that it has the optimal mix of floating and fixed.”*

An important aspect of the relationship between risk management publications and the value of the firm, is causality. Often it is hard to determine what exactly the relationship in terms of causality is. Does publication of risk management itself increase a company's value, or do successful companies have good risk management and therefore tend to publicize more about it?

Most of the arguments used to reason about the value of risk management can also be used for the mere formulation of risk management; whether the amount and nature of risk management truly is as publicized or not. Publication about risk management may generate more trust in the company with investors and other stakeholders. It can reduce the risk as perceived by outsiders, thus contributing to lower risk premiums on bonds and other debt, but also rising share

prices. It might increase sales, keep costs of retaining employees low, and overall make the company a more trusted party.

This research focuses on the following cause and effect relationship:

Publications about risk management → Company value

Therefore, our research question is:

“Does explicitly formulated risk management increase the value of a company?”

Data Description

The companies we have chosen to examine are 100 randomly chosen public companies listed on an American or Canadian stock exchange in the year 2006. In order to randomly choose these companies we have used the Excel random generator.

Dependent variables

In our research we would like to treat net present value as a proxy and indicator of the value of the firm. We do this because of the perceived superiority for many investors of the NPV method over other value estimation methods for projects and companies. However, it is hard to determine the NPV of a firm. Many NPV calculations are based on individual assumptions, and therefore there is no single correct answer.

Therefore we have decided to examine 4 other measures of company value: Return on Investment, Net Income divided by total revenues (profit margin), Tobin's Q and the P/E ratio. The first two measures are more objectively measurable, the latter two are measures of value which are influenced by investors' perception. ROI and profit margin are called the "objective value measures", Tobin's Q and the P/E ratio "perceived value measures".

Both objective and perceived measures are of importance to investors. Objective measures can be used as foundations in research for the company. They can predict or determine possible future revenues and incomes, and have a real effect on the company. Perceived measures give a more real-time measure of the company's value on the financial markets, and how investors feel about it. This measure is more important for investors, as stock prices have a real effect on investor's return ("Cash is King"). Also, predictions about the future are incorporated in financial markets earlier than in annual reports.

Independent variables

It is hard to determine how much a company publicizes about its risk management. There are many ways in which a company gives away much or some information about risk management.

Furthermore, the definition of risk management itself is also quite soft. Risk management might be a clear concept, but it encompasses things like hedging, customer retention policies, security, personnel policy, and policies on many other types of risk associated with doing business in the real world. Therefore, it is necessary to make a decision for a limited amount of non-perfect variables, which give information about the way a company might control all these risks. We have chosen to use the following:

- The number of times the word “risk” can be found in an annual report
- The percentage of the annual report dedicated to risk management and risk in general
- The amount of publications concerning “risk management”

Research Methodology

For the companies in our sample, the annual reports of 2006 have been used to determine to what extent risk management is discussed. Furthermore, the LexisNexis database has been used to find publications on the firms in our sample. We specifically looked for publications by using the search term “risk management”. These results have been manually checked to determine whether an investor can use the publication to form a better opinion on the risk management practices of the company.

Regression equations

From the variables and information above, 4 regression equations are generated, each with the proxies for risk management publication.

The 4 dependent variables are defined as following:

- Net income / total revenue of company *i* in year *t*
- ROI of company *i* in year *t*; ROI is defined as net income year *t* / market capitalization at end of year *t*
- Tobin's Q of company *i* at the end of year *t*

$$Tobin's Q = \frac{(Equity\ marketvalue + Liabilitie\ s\ bookvalue)}{(Equity\ bookvalue + Liabilitie\ s\ bookvalue)}$$

- P/E ratio of company *i* at the end of year *t*.

The 3 independent variables are defined as following:

- Percentage of the annual report of company *i* about year *t* dedicated to risk and risk management
- The number of the word "risk" in company *i*'s annual report of year *t*.
- The amount of publications in year *t* found on LexisNexis dedicated to company *i*'s risk management.

$$\frac{Net\ Income_{i,t}}{Revenue_{i,t}} = \alpha + \beta_1 PercRisk_{i,t} + \beta_2 WordsRisk_{i,t} + \beta_3 Publ_{i,t} + \varepsilon$$

$$ROI_{i,t} = \alpha + \beta_1 PercRisk_{i,t} + \beta_2 WordsRisk_{i,t} + \beta_3 Publ_{i,t} + \varepsilon$$

$$TobinsQ_{i,t} = \alpha + \beta_1 PercRisk_{i,t} + \beta_2 WordsRisk_{i,t} + \beta_3 Publ_{i,t} + \varepsilon$$

$$P/E_{i,t} = \alpha + \beta_1 PercRisk_{i,t} + \beta_2 WordsRisk_{i,t} + \beta_3 Publ_{i,t} + \varepsilon$$

Control variables

Because it is expected that the above variables are not possible to have a very big influence on the value of the company, three control variables have been added to each regression equation:

- Total sales of company i in year t
- Leverage of company i in year t ; leverage is determined as liabilities/total assets.
- Balance total of company i at the end of year t

Results

Table 1

The sample period is 2006 and consist of 105 listed companies from the US and Canada. In order to estimate the effects of risk management publications on firm value four regressions are estimated. One of the regressions estimated is:

$$ROI_{i,t} = \alpha + \beta_1 PercRisk_{i,t} + \beta_2 WordsRisk_{i,t} + \beta_3 Publ_{i,t} + \varepsilon$$

where ROI (1), the dependent variable, stands for the return on the investment of firm I in year t. The same regression is estimated with other dependent variables [(2), (3), (4)] as measures for firm value. "PercRisk" stands for the percentage devoted to risk in the annual report of firm I in year t, "WordRisk" is the number of the word "risk" in company i's annual report of year t. "Publ" is the amount of publications in year t found on LexisNexis dedicated to company i's risk management. Leverage, Total Sales and Total Assets are used as control variables.

	2006			
	Relative Profits (1)	ROI (2)	Tobin's Q (3)	P/E Ratio (4)
Constant	0,464 (0.459)	0,110 (0.062)	-10,221*** (0.000)	16,596 (0.013)
% Risk	- 0.104*** (0.005)	-0.011*** (0.001)	0.174 (0.218)	-0.971 (0.010) **
Word Risk	0.002 (0.865)	0.000 (0.894)	0.033 (0.366)	0.072 (0.464)
Publications	0.021 (0.737)	0.000 (0.956)	0.108 (0.666)	-0.232 (0.725)
Leverage	0.008 (0.692)	0.001 (0.733)	0.005 (0.949)	0.545** (0.011)
Total Sales	0.136 (0.217)	0.005 (0.609)	7.287 (0.000)	0.082 (0.943)
Total Assets	0.000 (0.908)	0.000 (0.527)	0.000 (0.898)	0.000 (0.910)
N	105	105	105	105
R ²	0.126	0.15	0.759	0.144
F value	2.217** (0.048)	2.703** (0.018)	48.257*** (0.000)	2.546** (0.025)

(*** significant at 1%, ** significant at 5%, * significant at 10%)

Test for assumptions:

Normality

To test for normality, a graphic approach was used, to visually determine whether the variable was close to a normal distribution.

The variables “Percentage on Risk”, Leverage, Sales and “Words on Risk” show a distribution that is closely to normal; the amount of publications and balance total of the company are less normally distributed.

Homoscedasticity

Again, residual plots have been used to visually test for homoscedasticity.

For the P/E ratio, Tobin’s Q and Relative Profits there has been found homoscedasticity. However, for ROI, a linear pattern can be found, which indicates that there is a positive relationship between the value of the dependent variable and the value of the residual.

Multicollinearity

All variables have a VIF value of less than 2, except for size, which is just above 2. Also, Words on Risk is higher, averaging about 1,8. However, since all values are less than 5 or 10 (proposed limits with regard to multicollinearity), we can conclude that this doesn’t pose a problem for our research.

Analysis of the results

The results show mixed findings. The first check, whether the model has any ability to predict the dependent variable, succeeds for all models. The F-value is significant in every model at 5%, with the Tobin’s Q model at 1% significance.

The second check, the R2, shows that only Tobin's Q model stands out between the others. At 75.9%, the model is remarkably well able to predict the value of Tobin's Q. Important however, is that the dependent variable for Total Sales has significance at the 1% level. This is a control variable. The independent variables that the research focuses on all are not significant at the 20% level. This is also true for the other two control variables.

When the 3 main independents are researched, it is extraordinary to see that in all regressions except for the Tobin's Q, the percentage of the annual report attributed to risk is highly significant (all at the 1% level), and above all negative. This is contrary to the belief the researchers had about an expected positive relationship between risk publication and firm value. The only other significant researched variable (at 20%), is the number of words "risk" in relation to relative profit.

For the control variables only Sales (1%, Tobin's q, positive sign) and Leverage (5%, P/E ratio, and positive sign) are significant at the 20% level. This result strengthens the belief that a better ability to leverage the company can increase the value of the company as measured in the P/E ratio.

Conclusions and direction for future research

Conclusions

In this research paper, we have searched for the correlation between the publication of risk management and company value. Most researches about risk management mainly focus on how risk management affects the value of the company, but we focussed our concentration on the publication of risk management. We have defined proxies for publication of risk management, and then we analyzed the relationship of these proxies with the performance and value measures of a company. To achieve better results we have used size, balance total and leverage ratio as control variables; we have also analyzed 4 different dimensions of performance.

In the light of data analysis, we have concluded that publication about risk and risk management is negatively correlated with the company value. Although many researches related risk management concluding that risk management is increasing the value of the company, we can justify our findings from different aspects;

If the companies are stressing too much about its risk and risk management, investors may conclude that this company is spending too much for risk management and this money could have been used for investments instead.

If a company devotes a significant part of the annual report to risk and risk management, investors could perceive that this company is too risky to invest in.

Another way to interpret our result could be by thinking in the reverse direction; since the companies face too much risk in their business they have less future cash flow prospects and this will affect negatively the value of the company. Risk related publication could be just a natural result of the situation. This could be summarized in the following cause effect relation;

Risk → less profits (and value) → more risk management → more publications in the annual report

To gain more proof on the reason of the negative correlation that we have concluded, further researches could be done.

Directions for future research

Further researches could be done based on our findings or our methods. We have analyzed a random sample; a research also could have been done based on some certain industries. The results may change in sectors like oil and mining in which risk management is very essential. Another interesting further research could be to investigate the correlation between risk management publication and company value during the crisis environment. Since at the moment the latest available data is for 2008, we could not have a chance to evaluate the crisis effect on this correlation. We would also like to define the presence of Chief Risk Officer as a proxy in

our research but since our data set is from 2006 and there were just 3 companies with a CRO in our sample, we could not have a chance to see the significance of existence of CRO. A further research could have been done with more various proxies including the existence of CRO.

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