

Ownership and Risk Management: Shareholder versus Stakeholder Satisfaction

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Abstract

The relationship between ownership structure and performance has received considerable attention in the literature. This paper focuses on the relationship between ownership structure and risk management. Specifically, the paper addresses the relationship between (1) the identity and influence of the largest shareholder and (2) whether risk management decisions are made in order to satisfy shareholders in particular or stakeholders in general. Covering a sample of Danish, non-financial companies a statistically significant, *negative* relationship is found between personal ownership and the likelihood that the aim of risk management is to satisfy shareholders in particular. No significant relationship is found for foundation-owned companies. Furthermore, a positive relationship is found between the size of the company and the tendency to satisfy shareholders in particular. The finding in relation to personal ownership is believed to rest on non-financial relations between the companies and the persons in question.

Keywords: Ownership Structure, Risk Management, Shareholders versus Stakeholders.

1. Introduction

The very concept of optimal ownership structure as well as the actual and potential implications of different ownership structures on especially performance has received considerable theoretical and empirical attention. The focus of this paper is on the relationship between ownership structure and risk management.

In non-financial companies risk management comprises various departments dealing in various markets. The focus of this paper is the risk management performed by the finance department.

One avenue of research could be to take an operational approach and look at the use of derivatives etc. This paper follows a more strategic approach. It analyses the relationship (if any) between different ownership structures and the aim of risk management - the aim being either to satisfy shareholders in particular or stakeholders in general.

This paper contributes to the existing literature by providing empirical evidence on the relationship between ownership structure and the aim of risk management. To our knowledge, it is the first time that this relationship is addressed explicitly.

The general purpose of the paper is

to analyse empirically the relationship between ownership structure and risk management.

The more specific purpose of the paper is

to analyse empirically the relationship (if any) in non-financial companies between (1) the ownership structure as measured by the identity and influence of the largest shareholder and (2) whether the aim of risk management is to satisfy shareholders in particular or stakeholders in general.

The results of the empirical study are based on questionnaires sent to Danish, non-financial companies listed on the Copenhagen Stock Exchange as of the end of 2001 and on public information from Greens (a Danish supplier of company information). A statistically significant, *negative* relationship is found between personal ownership and the likelihood that the aim of risk management is to satisfy shareholders in particular as opposed to stakeholders in general. No significant relationship is found for foundation-owned companies. Furthermore, a positive relationship is found between the size of the company and the tendency to satisfy shareholders in particular.

Section 2 gives a short literature overview. Section 3 states the methodology of the study. Section 4 shows descriptive statistics. Section 5 states the hypotheses and shows some preliminary results. Section 6 reports the empirical results of the study. Section 7 concludes.

2. Literature Overview

The question of (optimal) ownership structure has received considerable attention in the literature. One of the founding articles is Jensen and Meckling (1976), who develop a general theory of the ownership structure of a company.

The articles that focus on the effect of the composition of equity are of particular relevance to the present paper. Who are the major shareholders and how much do they own? However, the primary focus of previous papers has been on analysing the relationship between ownership structure and performance. This discussion dates back to work of Berle and Means (1932), which suggests the existence of an inverse relationship between the diffuseness of shareholdings and firm performance. Demsetz and Villalonga (2001) provide a good overview of the more recent empirical literature on the relationship between ownership structure and performance.

Demsetz and Vilalonga (2001) support the notion that there is no statistically significant relation between ownership structure and company performance. One of the reasons behind this lack of significance is the market in which ownership structures are formed. Although this market may not be perfect, profit-maximizing investors will not allow a systematic relation between ownership structure and performance to persist (survival of the fittest). Demsetz and Vilalonga further argue that studies that do find such a relation often fail to address the problem of ownership structure being endogenous. Company performance is as likely to affect ownership structure, as ownership structure is to affect performance.

In a Danish perspective Thomsen (1996) finds that the performance of foundation-owned companies is as good (or maybe even slightly better) than the performance of companies that are not owned by such private, self-governing institutions. Extending the work to include six European nations Thomsen and Pedersen (1996) find no significant performance differences between different ownership structures.

The focus of the present paper is on ownership structure and the aim of risk management. Specifically, to what degree the aim of risk management in non-financial companies is to satisfy shareholders in particular or stakeholders in general. This work is inspired by the debate on the corporate objective function and whether the prime beneficiaries of management decisions should be the owners of the company or more generally the stakeholders of the company (e.g. Jensen, 2001).

To our knowledge the relationship between ownership structure and the aim of risk management has not been addressed previously.

3. Methodology of Study

This study is based on public information from Greens (a Danish supplier of company information) and questionnaires sent to Danish, non-financial companies listed on the Copenhagen Stock Exchange as of the end of 2001. Questionnaires were sent to 117 companies in October 2001 and as of the end of December 2001 52 questionnaires were returned reaching a response rate of 44 per cent.

The Copenhagen Stock Exchange (CSE) uses the Global Industry Classification Standard (GICS) developed by Standard & Poor's and Morgan Stanley Capital International. GICS is comprised of 10 economic sectors:

- 10 Energy
- 15 Materials
- 20 Industrials
- 25 Consumer Discretionary
- 30 Consumer Staples
- 35 Health Care
- 40 Financials
- 45 Information Technology
- 50 Telecommunication
- 55 Utilities

and further divided into 23 industry groups, 59 industries and 123 sub-industries. Questionnaires were sent to companies in all economic sectors except Energy (10) as no such

companies are listed at the CSE and except Financials (40) as the target group of this study is non-financial companies. Furthermore, within the economic sector of Consumer Discretionary (25) the industry group Hotels Restaurants & Leisure (2530) was excluded because local soccer clubs with little international involvement comprise the main elements of this group.

A few more corrections as to the target group were made. (1) Companies with headquarters outside Denmark, (2) companies whose main activities are to hold stocks in listed companies that are themselves included in the study, and (3) companies in which an overwhelming majority of stocks is held by another listed company (with own operational activities) that is itself included in the study, were excluded.

As such 117 Danish, non-financial companies listed on the CSE were approached in October 2001. By telephone conversations the target persons were identified. The target persons were primarily finance managers (but also CFOs and treasurers). A questionnaire containing 17 closed-end questions (the questionnaire is available on request) was sent to the 117 target persons. The companies were promised confidentiality. In November the companies that had not responded were contacted by telephone (or by e-mail). By the end of December 2001 a total of 52 companies had sent filled-out questionnaires covering seven economic sectors (the single company in Telecommunications (50) did not want to be part of the study).

To address the problem of non-response bias the group of respondents is compared to the group of non-respondents in relation to size (consolidated turnover 2001) and economic sector (GICS). All in all the sample of 52 companies does seem to represent the population as a whole without significant differences. The only exception is that Health Care companies

(GICS 35) tend to respond more often than companies in other economic sectors. For elaboration of this topic please see Appendix A.

4. Descriptive Statistics

As put forward in the introduction the focus of this paper is on the aim of the company in relation to risk management and the possible impact from different ownership structures. Or put more precisely in relation to the aim, whether the aim of the company in relation to risk management is to satisfy shareholders in particular or to satisfy stakeholders in general.

In the questionnaire the companies were asked to check (x) the statement that best matched the aim of the company. The exact question asked was

“How would you characterize the aim of your company (in relation to risk management)?”

And the respondents could choose between

- (1) “____To satisfy stakeholders in general”
- (2) “____To satisfy shareholders in particular”
- (3) “____Other:_____”.

Three companies of the 52 companies that did send in their questionnaires did not respond to this question. As such, the sample was reduced to 49 companies.

The 49 companies are divided between three subgroups according to the largest shareholder (in case of A and B shares, the shareholder with the largest amount of voting power is chosen):

- (1) Person (the largest shareholder is a person).
- (2) Foundation (the largest shareholder is a foundation, i.e. a private, self-governing institution).
- (3) Other (the largest shareholder is not a person nor a foundation, typically another company).

In grouping the companies due consideration is taken to obvious indirect ownership. E.g. if the largest shareholder of Company A is Company B, Company A is put in the group “Person” if Company B is owned 100% (or by a overwhelming majority) by a person.

Table 1 shows some descriptive statistics on the 49 companies grouped by the largest shareholder.

Table 1 Descriptive Statistics on Companies Grouped by Largest Shareholder

	Total	Largest shareholder ¹		
		Person	Foundation	Other ²
Economic Sector (number of companies)				
Materials (15)	5	0	4	1
Industrials (20)	17	2	4	11
Consumer Discretionary (25)	7	4	1	2
Consumer Staples (30)	5	0	1	4
Health Care (35)	9	4	3	2
Information Technology (45)	5	3	0	2
Utilities (55)	1	0	0	1
Total	49	13	13	23
Age (years)				
Median	45	31	66	63
Mean	59	44	65	63
Maximum	210	210	136	162
Minimum	2	10	2	4
Total assets (mill. DKK end 2001)				
Median	1,701	518	3,618	1,812
Mean	4,260	959	5,753	5,282
Maximum	31,956	3,233	28,905	31,956
Minimum	58	195	335	58
Growth in Total Assets (p.a. last 3 years)				
Median	13%	21%	8%	7%
Mean	40%	37%	14%	56%
Maximum (999% is from base 0)	999%	123%	52%	999%
Minimum	-34%	-3%	-8%	-34%
Return on Assets (simple average last 3 years)				
Median	6%	8%	7%	5%
Mean	2%	4%	11%	-4%
Maximum	44%	44%	34%	12%
Minimum	-65%	-64%	3%	-65%
Solvency Ratio (end 2001)				
Median	41%	37%	38%	41%
Mean	45%	47%	41%	46%
Maximum	94%	93%	70%	94%
Minimum	8%	20%	8%	16%
Owner share (largest shareholder end 2001)				
Median	31%	39%	64%	28%
Mean	40%	39%	58%	30%
Maximum	85%	70%	85%	63%
Minimum	10%	10%	26%	10%

¹ Including obvious indirect ownership (e.g. if the largest shareholder is a company, which is majority owned by e.g. a person.)

² Includes Danish (13) and foreign (4) companies, institutional investors (4), local (1) and state (1) authorities.

Few of the variables in Table 1 seem to be normally distributed. As such, standard deviations are not included in the table and significance tests are not performed at this preliminary stage. However, a few general observations can be made.

Companies in which a person is the largest shareholder seem to be younger (Age) and smaller (Total Assets) than other companies. Furthermore, foundations tend to own a larger share (Owner Share) of the companies in which they are the largest shareholders than other companies.

The sample is too small and the period is too short to say anything statistically significant about performance. However, as a curiosity it is interesting to see the (superior) performance of companies in which the largest shareholder is a foundation according to the figures for Return on Assets (robust for other accounting measures of performance). Using accounting data for the period 1982-1992 for a sample of the 300 largest Danish companies Thomsen (1996) finds that foundation-owned companies perform slightly *better* than other companies in spite of the presumed less intensive pressure for (short term) profit creation.

5. Hypotheses and Preliminary Results

The relationship between ownership structure and corporate performance has been the focus of several empirical investigations as put forward in the literature overview. No such attention has been given to the relationship between ownership structure and risk management.

Specifically, this and the next section investigates the relationship between on the one hand the identity (person, foundation, other) and influence (owner share) of the largest shareholder and on the other hand the aim of risk management (satisfying shareholders in particular as opposed to satisfying stakeholders in general).

Two hypotheses are tested:

Hypothesis 1:

The tendency to satisfy shareholders in particular (as opposed to stakeholders in general) in relation to risk management is higher in companies in which a (influential) person is the largest shareholder than in other companies.

Hypothesis 2:

The tendency to satisfy stakeholders in general (as opposed to shareholders in particular) in relation to risk management is higher in companies in which a (influential) foundation is the largest shareholder than in other companies.

The arguments behind the hypotheses are based upon the supposed influence and preference of the largest shareholder:

- (1) Owner share
- (2) Specific preferences (shareholders/stakeholders)
- (3) Intensity of preferences (strong/weak)

Re. 1

The more the person / foundation owns, the more influence. Owner share is controlled for explicitly.

Re. 2

A person is selfish. He or she first and foremost wants to pursue own (monetary) interests. As such, he / she wants all management decisions (including decisions on risk management) to be directed towards fulfilling shareholders' interests.

A foundation is a self-governing institution. Normally, the foundation is established by the founder of the company (or his / her heirs) with the purpose of securing the well-being and survival of the company. As such, the interests of the foundation are not limited to the interests of the shareholders but are directed to the company as a whole (including all stakeholders).

Re. 3

A person is supposed to have a strong preference for decisions pursuing his / her own interests. A foundation, on the other hand, is a self-governing institution that per definition does not have any personal (and thus strong) preferences.

As such, hypothesis 1 is expected to be strongly supported while hypothesis 2 is expected to be modestly supported.

As stated previously 49 companies answered the question of who to satisfy in relation to risk management. We term the companies whose aim of risk management is to satisfy shareholders in particular “Shareholder Companies” and the companies whose aim of risk management is to satisfy stakeholders in general “Stakeholder Companies”. Shareholder Companies include three companies that put equal weight on satisfying shareholders in particular and on satisfying stakeholders in general.

Table 2 below shows the division between Shareholder Companies and Stakeholder Companies for the total sample and for the different ownership groups (in numbers and in percentages).

Table 2 Shareholder versus Stakeholder Orientation in Risk Management

	Total	Largest shareholder ¹		
		Person	Foundation	Other ²
<u>Numbers</u>				
Shareholder Companies ³	31	5	10	16
Stakeholder Companies ⁴	<u>18</u>	<u>8</u>	<u>3</u>	<u>7</u>
	49	13	13	23
<u>Per cent</u>				
Shareholder Companies ³	63%	38%	77%	70%
Stakeholder Companies ⁴	<u>37%</u>	<u>62%</u>	<u>23%</u>	<u>30%</u>
	100%	100%	100%	100%

¹ Including obvious indirect ownership (e.g. if the largest shareholder is a company, which is majority owned by e.g. a person).

² Includes Danish (13) and foreign (4) companies, institutional investors (4), local (1) and state (1) authorities.

³ The aim of risk management is to satisfy shareholders in particular (includes 3 companies with equal weight).

⁴ The aim of risk management is to satisfy stakeholders in general.

As can be seen from Table 2 the majority of companies are Shareholder Companies. This is also true for the group of companies in which a foundation is the largest shareholder. In fact, only a very small difference exists between the proportion of Shareholder Companies in the group of companies in which a foundation is the largest shareholder and in the group of companies in which neither a person nor a foundation (generally another company) is the largest shareholder. At this preliminary stage, Hypothesis 2 does not seem to be supported.

The general conclusion on Shareholder Companies being the majority does not apply to the group of companies where a person is the largest shareholder. In this group a majority of companies state that the aim of risk management is to satisfy stakeholders in general (in clear contrast to the reasoning behind Hypothesis 1).

Table 2 presents a rough and partial picture. The next section performs a more thorough analysis in which factors such as size, growth, performance, and solvency are included and controlled for.

6. Regression Analysis

Does ownership structure influence the aim of risk management? The preliminary results of the previous section suggest that companies in which the largest shareholder is a person tend to favor stakeholders, while there does not seem to be an effect from foundations being the largest shareholder. However, as already mentioned other factors may lead the results.

Size could be such a factor. The focus of the Danish stock market (stock analysts and investors) is primarily directed towards the large companies. The shares of the small companies are illiquid due partly to this biased attention. The pressure on the large companies for delivering value to the shareholders is intense and constant. Table 2 suggests that companies in which a person is the major shareholder are more likely to satisfy stakeholders in general as opposed to shareholders in particular. However, the descriptive statistics show that companies in which the largest shareholder is a person tend to be smaller than other companies. Thus, the tendency to favor stakeholders may not be a result of personal ownership but be a result of size.

Other factors could be driving the results or at least influence the results. Such factors should be controlled for before concluding on the effect from ownership structure to the aim of risk management. The growth of the company, the profitability of the company, and the solvency of the company together with the size of the company are all variables that could influence the tendency to satisfy shareholders as opposed to stakeholders in relation to risk management decisions. E.g. high growth companies may favor shareholders because they have to go to the stock market in the near future to ask for more money, highly profitable companies are not put under intense pressure by the stock market leading to more focus on

stakeholders in general, and highly solvent companies do not need to visit the stock market leading to a more holistic (stakeholders) view of the company. The arguments may be turned around. The crucial factor is that these factors can influence the tendency of the company to satisfy shareholders as opposed to stakeholders in relation to risk management. Whether the factors in fact do influence this tendency is an empirical question.

Size, growth, profitability, and solvency cover major potential influences although one could argue that other factors are of relevance as well. The exact measurement of the variables is no exact science. However, the major findings in the regression analysis are robust to different accounting variables being used to measure size (turnover instead of assets), growth (growth in turnover instead of growth in assets), profitability (return on equity instead of return on assets), and solvency (liquidity ratio instead of solvency ratio).

Table 3 shows a regression analysis in which seven independent variables are used to explain if the aim of risk management in the company is to satisfy shareholders in particular (value = 1) or the aim of risk management in the company is to satisfy stakeholders in general (value = 0). Apart from the four variables above (size, growth, profitability, and solvency) and a constant, two variables are included to cover the presence (0, 1) and magnitude (0% - 100%) of a person (i.e. Owner Share * Person Dummy) or a foundation (i.e. Owner Share * Foundation Dummy) being the largest shareholder. Appendix B shows a correlation matrix of the independent variables.

Table 3 Regression Analysis on Shareholder Orientation in Risk Management

Independent Variables ¹	Total (49 obs.)	Largest Shareholder ²		
		Person (13 obs.)	Foundation (13 obs.)	Other ³ (23 obs.)
Constant	0.3616	-0.5201	1.9726 *	-0.0836
Log (Total Assets (mill. DKK end 2001))	0.0804	0.1302	-0.2432	0.1198 **
Growth in Total Assets (p.a. last 3 years)	-0.0446	0.4928	0.4114	-0.0374
Return on Assets (simple average last 3 years)	0.0015	-0.0117 *	0.0201	0.0070
Solvency Ratio (end 2001)	-0.3723	-0.1619	1.1470	-0.1176
Owner Share * Person Dummy ⁴	-0.9412 **			
Owner Share*Foundation Dummy ⁵	-0.2386			
R-squared	0.2990	0.4097	0.3401	0.5429
Adjusted R-squared	0.1989	0.1145	0.0102	0.4413
Probability (F-statistic)	0.0161	0.3205	0.4475	0.0051

¹ Level of significance is indicated below the coefficients (1%: ***, 5%: **, 10%: *).

² Including obvious indirect ownership (e.g. if the largest shareholder is a company, which is majority owned by e.g. a person).

³ Includes Danish (13) and foreign (4) companies, institutional investors (4), local (1) and state (1) authorities.

⁴ Person Dummy = 1 if largest owner is a person, 0 otherwise.

⁵ Foundation Dummy = 1 if largest owner is a foundation, 0 otherwise.

The main finding is that there is a significant (at a 1.03 per cent level), *negative* relationship between (1) the product of owner share and the dummy for a person being the largest shareholder and (2) the likelihood that the aim of the company in relation to risk management is to satisfy shareholders in particular. Put in another way, the more influence a person has as the largest shareholder in a company, the more likely it is that this company will tend to satisfy stakeholders in general (as opposed to shareholders in particular) when making decisions related to risk management. This finding is also valid when controlling for industry structure (integrating dummies for the different economic sectors). As such, the immediate conclusion from Table 2 is confirmed.

If the dummies for person and foundation ownership are excluded from the table (not shown) size turns out to be a significant, independent variable. As such, there is a positive relationship between size and the tendency to favor shareholders in relation to risk management *but* this relationship is not so much a causal relationship as one might immediately suppose.

Instead the relationship (partly) exists because companies in which the largest shareholder is a person tend to be smaller than other companies and tend to favor stakeholders in general (as opposed to shareholders in particular) more than other companies. However, it seems that size by itself does have some impact on the tendency to satisfy shareholders. This is based on two observations:

- (1) Size is very close to being significant at a 10 per cent level when looking at the total sample.
- (2) Size is significant at a 5 per cent level when looking at the group of companies where a person or a foundation is not the largest shareholder (“Other”). This conclusion also holds if the owner share of the largest shareholder is included as an independent variable.

Foundation ownership, on the other hand, does not seem to influence the aim of risk management. The coefficient is negative. A negative coefficient supports Hypothesis 2, which states that the tendency to satisfy stakeholders in general (as opposed to shareholders in particular) in relation to risk management is higher in companies in which a foundation is

the largest shareholder than in other companies. However, the coefficient is far from being significant.

Based on the findings above conclusions as to the two hypotheses put forward in the previous section can be drawn:

Hypothesis 1 is rejected (but accepted if opposite sign).

“The tendency to satisfy shareholders in particular (as opposed to stakeholders in general) in relation to risk management is higher in companies in which a (influential) person is the largest shareholder than in other companies.”

Hypothesis 2 is not supported.

“The tendency to satisfy stakeholders in general (as opposed to shareholders in particular) in relation to risk management is higher in companies in which a (influential) foundation is the largest shareholder than in other companies.”

We did not expect Hypothesis 2 to be strongly supported. Previous studies (Thomsen, 1996) have found that Danish foundation-owned companies perform just as well (or maybe even slightly better) than other companies. Their risk management strategies might also resemble those of other companies. Furthermore, the concept of self-selection bias further justifies the lack of support for Hypothesis 2. Companies that unduly satisfy stakeholders on the expense of shareholders may either die because of the inability to attract new capital from the stock market or delist because the stock market as a capital source is irrelevant (all companies in this study are listed companies). All in all, we should not be too surprised not to find significant support for Hypothesis 2.

The rejection of Hypothesis 1 is troublesome at least at first sight. We did find a significant, relationship between the existence and influence of a person as the largest shareholder and the likelihood that the aim of the company in relation to risk management is to satisfy

shareholders in particular. However, the relationship is *negative*. Is this a coincidence or are the previously stated arguments behind Hypothesis 1 flawed?

The arguments put forward previously are based on the economic model of human behavior (Jensen, 1994). A person is thought to be a “short-run money maximizer”. This assumption is valid when the persons in question are the largest shareholders because they are short-run investors that believe that within a certain time horizon investments in these particular companies are superior (in money terms) to other investments. Looking at the persons who are the largest shareholders in this sample, this assumption is *not* valid.

A majority of the persons in question are either founders of the companies, heirs of the founders, or relatives to the heirs or founders. These persons do not see the company as a simple “money vehicle” but (also) as part of their family history. Securing the well-being and survival of the company becomes a target in itself. As such, preferences are not directed solely to the shareholders but more to the company as a whole including all stakeholders (resembling the arguments put forward in relation to the foundation).

Conclusively, we should not be too surprised to find a significant, *negative* relationship between the existence and influence of a person as the largest shareholder and the likelihood that the aim of the company in relation to risk management is to satisfy shareholders in particular.

7. Conclusion

This paper focuses on the relationship between ownership structure and the aim of risk management. Specifically, focus is on the relationship between on the one hand the identity and influence of the largest shareholder and on the other hand whether risk management decisions are made in order to satisfy shareholders in particular or stakeholders in general.

The study covers a sample of Danish, non-financial companies listed on the Copenhagen Stock Exchange. A statistically significant, negative relationship is found between the existence and influence of personal ownership and the likelihood that the aim of risk management is to satisfy shareholders in particular. This finding is believed to be a result of the persons in question having non-financial relations to the companies.

For foundation-owned companies a negative, but statistically insignificant relationship is found between personal ownership and the likelihood that the aim of risk management is to satisfy shareholders in particular.

Furthermore, a positive, and partly statistically significant relationship is found between the size of the company and the tendency to satisfy shareholders in particular in relation to risk management decisions. Although there is a negative correlation between the size of the company and the presence / influence of persons as largest shareholders there seems to be a separate and positive effect from size on the likelihood of favoring shareholders in particular.

Geographical scope and numbers of course limit this study.

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Appendix A

In the Appendix it is examined whether the classification of companies (GICS) and the size of the company (consolidated turnover 2001) have a significant influence on the rate of response/non-response. To do this, a "test of independence" is completed. The test of independence is based on a "class test" and builds on examination of possible differences in the observed and expected values.

Table A1 Class Test on GICS No.

Observed values				Expected values				Test for independence			
GICS	no	yes	Total	GICS	no	Yes	Total	GICS	no	yes	
15	3	5	8	15	4.4	3.6	8.0	15	0.47	0.59	
20	31	19	50	20	27.8	22.2	50.0	20	0.37	0.47	
25	14	7	21	25	11.7	9.3	21.0	25	0.47	0.58	
30	4	5	9	30	5.0	4.0	9.0	30	0.20	0.25	
35	3	9	12	35	6.7	5.3	12.0	35	2.02	2.52	
45	8	6	14	45	7.8	6.2	14.0	45	0.01	0.01	
50	1	0	1	50	0.6	0.4	1.0	50	0.36	0.44	
55	1	1	2	55	1.1	0.9	2.0	55	0.01	0.01	
Total	65	52	117	Total	65.0	52.0	117.0	Total	3.90	4.87	8.77

Summarized the deviations equals 8.77 which is well below the critical value of 14.07¹. Thus the conclusion is that no significant differences can be found between the group that responded and the group that did not respond. Thus, no sectors overall had a different rate of response than expected, but does this hold when looking at the sectors individually?

¹ The critical value is found under the χ^2 -distribution of the statistical tables with degrees of freedom $(r-1)(k-1) = (8-1)(2-1) \Rightarrow 7$. The test is done as a right-tailed test (because of the characteristics of the distribution) with a significance level of 0.05.

Table A2 Comparison of Two Groups (GICS No.)

GICS	p1	p2	p-hood	var. P1	var. P2	var. p1 + var. p2	Std.dev.	Z obs.
15	0.0462	0.0962	-0.0500	0.0007	0.0017	0.0023	0.0480	-1.0417
20	0.4769	0.3654	0.1115	0.0038	0.0045	0.0083	0.0911	1.2244
25	0.2154	0.1346	0.0808	0.0026	0.0022	0.0048	0.0693	1.1655
30	0.0615	0.0962	-0.0346	0.0009	0.0017	0.0026	0.0510	-0.6787
35	0.0462	0.1731	-0.1269	0.0007	0.0028	0.0034	0.0583	-2.1771
45	0.1231	0.1154	0.0077	0.0017	0.0020	0.0036	0.0600	0.1282
50	0.0154	0.0000	0.0154	0.0002	0.0000	0.0002	0.0141	1.0911
55	0.0154	0.0192	-0.0038	0.0002	0.0004	0.0006	0.0245	-0.1570

The table above shows one sector (GISC no. 35) where the calculated Z-observation value is higher than the critical value of $\pm 1.96^2$. The conclusion is, that the group with GICS no. 35 is more likely to respond to the questionnaire than expected.

Table A3 Class Test on Turnover

Observed values				Expected values				Test for independence			
Turnover (mill. DKK)	no	yes	Total	Turnover (mill. DKK)	no	yes	Total	Turnover (mill. DKK)	no	yes	
0-249	16	8	24	0-249	13.5	10.5	24.0	0-249	0.45	0.58	
250-499	13	5	18	250-499	10.2	7.8	18.0	250-499	0.80	1.03	
500-999	11	7	18	500-999	10.2	7.8	18.0	500-999	0.07	0.09	
1000-2499	9	12	21	1000-2499	11.8	9.2	21.0	1000-2499	0.68	0.88	
2500-4999	8	8	16	2500-4999	9.0	7.0	16.0	2500-4999	0.12	0.15	
5000-	9	11	20	5000-	11.3	8.7	20.0	5000-	0.46	0.60	
Total	66	51	117	Total	66	51	117.0	Total	2.58	3.34	5.91

Summarized the deviations equals 5.91 which is well below the critical value of 11.07. Thus the conclusion is that no significant differences can be found between the group that responded and the group that did not respond. Thus, no sectors overall had a different rate of response than expected, but does this hold when looking at the sectors individually?

² Because the test builds on the presupposition of normally distributed random variables the critical value is found under the normal distribution of the statistical tables. The test is done as a two-sided test with a significance level of 0.05.

Table A4 Comparison of Two Groups (Turnover)

Turnover (mill. DKK)	p1	p2	p-hood	var. P1	var. P2	var. p1 + var. p2	Std.dev	Z obs.
0-249	0.2424	0.1569	0.0856	0.0028	0.0026	0.0054	0.0742	1.1531
250-499	0.1970	0.0980	0.0989	0.0024	0.0017	0.0041	0.0608	1.6271
500-999	0.1667	0.1373	0.0294	0.0021	0.0023	0.0044	0.0728	0.4040
1000-2499	0.1364	0.2353	-0.0989	0.0018	0.0035	0.0053	0.07	-1.4133
2500-4999	0.1212	0.1569	-0.0357	0.0016	0.0026	0.0042	0.0671	-0.5313
5000-	0.1364	0.2157	-0.0793	0.0018	0.0033	0.0051	0.0678	-1.1700

From the above table it follows that no group has a Zobservation higher than the critical value of +/- 1.96. Thus, in relation to the size of the company as measured by consolidated turnover in 2001 there is no reason to believe that differences exist between the group that responded and the group that did not respond.

Appendix B

Table B1 Correlation Matrix of Independent Variables

	Log (Total Assets)	Growth in Total Assets	Return on Assets	Solvency Ratio	Owner Share*Person
Log (Total Assets)	1.00				
Growth in Total Assets	0.02	1.00			
Return on Assets	0.34	-0.34	1.00		
Solvency Ratio	-0.15	0.43	-0.43	1.00	
Owner Share*Person	-0.29	-0.06	0.15	-0.08	1.00
Owner Share*Foundation	0.31	-0.10	0.26	-0.13	-0.29