

**Exchange Rate Exposure Management:
“Speculation” in Non-Financial Companies**

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Abstract

“Speculation” in non-financial companies in relation to exchange rate exposure management constitutes one of the contributing factors behind corporate (or more widespread) crises. Deviations from benchmark positions constitute speculation. An empirical study of Danish non-financial companies finds that the larger the company (ability) and the larger its relative sale on foreign markets (relevance), the more likely the company will be to benchmark its exchange rate exposures. However, at the same time the very same factors (size and foreign sale) lead to more extensive speculation. Financial solvency (value) does not seem to have a significant effect on the extent of benchmarking / speculation. Additional economic sector effects are only present in the case of speculation where companies in Materials tend to speculate more than other companies.

1. Introduction

“Speculation” in relation to exchange rate exposure management in non-financial Asian companies was one of several contributing factors to the Asian Crisis that began on July 2 1997 when Thailand abandoned its pegged exchange rate regime (Esho et al., 2002). The focus of this paper is on “speculation” in non-financial companies in a European context.

“Speculation” as a term brings to front a lot of negative associations. In benchmarking terms it is the deviation between the actual positions taken by the finance manager and the neutral positions in a benchmark model - deviations that exist because the finance manager has integrated his or her own view on the foreign exchange markets when deciding the actual positions. Keeping in mind this more neutral explanation we will continue to use the term speculation.

It is important to limit the divergences from an optimal hedging strategy or hedging benchmark. This is so whether the divergence is due to a sin of omission or the divergence is due to a sin of commission to stay in the terminology of Dolde (1993). An example of a sin of (too much) commission is the case of Metallgesellschaft in 1993 (Jorion, 1997). Metallgesellschaft hedged its contracts to sell oil through fixed-price contracts over ten years. However, the hedge, which was made up of futures positions, led to substantial losses here and now when oil prices fell because these positions were marked to market (as opposed to the fixed-price delivery contracts). An example of a sin of omission is the case of Daimler-Benz in 1995 (Stulz, 1996). Daimler-Benz Aerospace had a large part of its order book fixed in USD but failed to hedge this exposure. When the USD fell, Daimler-Benz had to take a provision to cover future losses.

The concept of optimality depends on the objective of hedging. The ultimate goal of hedging is to add value (Froot, 1994). In a perfect world hedging is a pure zero-sum game. However, in the real world imperfections change the rules of the game.

Fundamentally an increase in the expected value of the company derives from either a decrease in the discount rate or an increase in the future cash flows. This stems from the notion that the value of a company is the discounted value of the future cash flows.

The imperfections that can justify hedging are related to the discount rate

- non-diversified stockholders (and managers)
- or related to the future cash flows
- financial distress (e.g. Levi and Sercu, 1991)
 - ability to make value-adding investments (Froot, Scharfstein, and Stein, 1993)
 - taxes (e.g. Nance, Smith and Smithson, 1993).

Based on an empirical study of non-financial companies in Denmark this paper analyses the concept of speculation in relation to exchange rate exposure management in a small open economy. By explicitly focusing on the benchmarking aspect (or lack of same) of speculation, this paper distinguishes itself from the previous literature.

The purpose of this paper is

(1) to analyse empirically the extent of benchmarking in exchange rate exposure management in non-financial companies and the factors driving the extent of such benchmarking and

(2) to analyse empirically the extent of speculation in exchange rate exposure management in non-financial companies and the factors driving the extent of such speculation .

The empirical results of the paper are based on closed-end questionnaires sent to 117 Danish, non-financial companies listed on the Copenhagen Stock Exchange as of the end of year 2001. The analyses show that the extent of benchmarking is positively related to the size of the company and

positively related to the degree of foreign involvement as measured by the export share of the company's turnover. As regards to speculation the analyses show that the extent of speculation is positively related to the size of the company and to the degree of foreign involvement. Furthermore, the extent of speculation depends to some degree upon the economic sector in which the company operates.

The next section gives a short literature overview. The third section states the methodology of the study. The fourth section reports the empirical results. The fifth section concludes.

2. Literature Overview

A benchmark is “a standard by which something can be measured or judged” (American Heritage Dictionary). As such, a benchmark is a *standard*. And by this standard it is possible to *measure* or *judge* something. In relation to creating an optimal hedging strategy, the purpose of the benchmark is to measure the deviation from the optimal hedging strategy and to judge the performance of the finance manager.

The lack of benchmarks in some companies may be a contributing factor to the overwhelming focus on transaction exposures and near term operating exposures that are apparent in empirical studies (e.g. Bodnar, Marston and Hayt, 1998). The process of establishing benchmarks facilitates a hedging strategy encompassing the interaction between financial hedging and the ability of the company to undertake real actions (such as to reallocate production facilities) as a response to exchange rate changes. Without such a process companies tend to focus on the easily identifiable exchange rate exposures such as short term transaction exposures. The problem of benchmarking neutral positions in relation to exchange rate exposure management in non-financial companies has, however, received little attention in the literature.

If the finance manager does not incorporate his or her own view of the exchange rates in taking the hedge decisions, the need for establishing objective performance criteria is not urgent. This seems, however, not to be the case. Stulz (1996) argues that despite the spread of the doctrine of efficient markets, the world remains full of managers who are convinced of their own ability to predict future interest rates, exchange rates, and commodity prices.

Studies covering non-US companies (e.g. Alkeböck and Hagelin, 1999; Berkman, Bradbury, and Magan, 1997; Bodnar and Gebhardt, 1998; Ceuster, Durinck, Laveren, and Lodewyckx, 2000; Hakkarainen, Joseph, Kasanen, and Puttonen, 1998; Joseph and Hewins, 1997) as well as studies covering US companies (e.g. Bodnar, Marston, and Hayt, 1998; Dolde, 1993; Malindretos and Tsanacas, 1995) do not in general show large differences between US and non-US companies in relation to risk management practices (e.g. the focus in actual exchange rate exposure management on near-term and directly observable exchange rate exposures and the tendency of incorporating the company's own view when making “hedged”). However, the studies do show that companies in small, open economies tend to be more active derivative users than their US counterparts.

3. Methodology of Study

This study is based on 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%.

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:

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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 email). By the end of December 2001 a total of 52 companies had sent filled-out questionnaires.

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) 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 1.

Table 1 shows the 52 companies in the sample in relation to consolidated turnover, export share and solvency ratio.

Table 1 Companies in Sample¹

Year 2000 ²	Consolidated Turnover (mill. DKK)	Export Share ³ (Export/Turnover)	Solvency Ratio (Equity/Total Assets)
Average	5,275	60%	44%
Median	1,449	71%	41%
Maximum	84,301	100%	96%
Minimum	0	0%	8%

¹ Source: Greens Erhvervsinformation A/S

² Where possible (end of) year 2000 figures are used. If not the accounts of 99/00 or 00/01 are used.

³ Where export figures are not available, information from questionnaire is used.

The average company has a consolidated turnover of DKK 5,275 million (USD 658 million). Of this turnover 60 per cent is exported. Looking at the financial solvency as measured by equity / total assets this solvency ratio is 44 per cent. The median company is somewhat smaller but does also have a high export share and a solvency ratio in the forties. The largest company as measured by turnover has a turnover of DKK 84,301 million (USD 10,511 million) and the smallest has a turnover of DKK 0 (recently established research companies). In terms of export shares the range goes from 0 per cent to 100 per cent and in terms of solvency ratios the range goes from 8 per cent to 96 per cent.

4. Benchmarking and Speculation

This section analyzes (1) the extent of benchmarking in exchange rate exposure management in non-financial companies and the factors driving the extent of such benchmarking and (2) the extent of speculation in exchange rate exposure management in non-financial companies and the factors driving the extent of such speculation.

The companies were asked to characterize the hedging policy of their companies by answering yes or no to five statements. The questions focus on to what degree and with how much dedication the use of a benchmark model or at least an approved hedging policy is pursued. By quantifying a “no” as 1 and a “yes” as 2 a benchmark indicator is developed with a minimum of 5 and a maximum of 10.

Only one third of the companies do have an explicit benchmark model, which lists neutral positions and limits for deviations. However, the boards of directors approve the hedging policy (and the benchmark model if any) in three quarters of the companies. For an elaboration of the questions asked and the benchmark indicator together with an overview of how the companies responded to the individual questions, please see Appendix 2.

The purpose of the following analysis is to investigate which factors drive the result as to the extent of benchmarking. Three hypotheses are put forward as to ability (H1), relevance (H2), and value (H3):

Hypothesis 1 (ability):

A positive correlation exists between the size of the company and the benchmark indicator.

In order to go through the process of benchmarking certain resources have to be allocated. The relative burden of such an allocation falls with the size of the company. As such, it is expected that the

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size of the company contribute positively to the extent of benchmarking. Below consolidated turnover is used as a proxy for size (alternative proxies such as total assets lead to similar results).

Hypothesis 2 (relevance):

A positive correlation exists between foreign involvement and the benchmark indicator.

Managing exchange rate exposures actively by benchmarking is only relevant if the company is sensitive to the development in foreign markets either directly (sales or purchases in foreign markets) or indirectly (foreign competitors). As such, it is expected that the degree of foreign involvement contributes positively to the extent of benchmarking. Below the share of the consolidated turnover that is exported is used as a proxy for foreign involvement (including the relative share of costs that are imported lead to similar results and including indirect exposures were abandoned because of quantification problems).

Hypothesis 3 (value):

A negative correlation exists between financial solvency and the benchmark indicator.

The value addition of active management of exchange rate exposures comes primarily from a focus on cash flows and from avoiding lower tail outcomes. As such, it is expected that the degree of financial solvency contribute negatively to the extent of benchmarking. The solvency ratio (equity / total assets) is used as a proxy for financial solvency. It may be argued that the solvency ratio is not a cash flow measure and correctly so. However, the solvency ratio possesses the advantage that apart from telling how much of a company is “financed” by equity, it also to some extent serves as a proxy for the ability of the company to quickly obtain funds from external sources.

Table 2 shows a regression analysis testing the three hypotheses. Apart from a constant and the three factors from the hypotheses above (consolidated turnover, export share, and solvency ratio) economic sector dummies (Industrials being the default economic sector) are integrated into the analysis in order to capture potential effects from different industry structures that may by themselves (and not captured by the other independent variables) be a deciding factor for the extent of benchmarking.

Table 2 Regression analysis for Benchmark Indicator ¹

Independent variables:	Coefficients ²
Constant	7.73 ***
Consolidated turnover (mill. DKK)	0.000028 *
Export share (Export / Turnover)	1.07 *
Solvency ratio (Equity / Total assets)	-1.94
Sector 15 dummy	0.49
Sector 25 dummy	0.06
Sector 30 dummy	0.04
Sector 35 dummy	0.55
Sector 45 dummy	-0.63
Sector 55 dummy	1.08
R-Squared	0.31

¹ Sample consists of 52 companies, included observations 49, excluded observations 3.

² Level of significance is indicated below the coefficient (1%:***, 5%:**, 10%:*)

From Table 2 we can conclude that hypothesis 1 and 2 are accepted at a 10 per cent level of significance. As such, the size of the company (consolidated turnover) and the degree of foreign involvement (export share) do seem empirically to favor a larger degree of benchmarking in exchange rate exposure management in Danish non-financial companies. The financial solvency as measured by the solvency ratio is only close to being significant at a 10 per cent level. No economic sector dummies are even close to being significantly different from zero.

Speculation as a term brings to front a lot of negative associations as stated in the introduction. In benchmarking terms it is the deviation between the actual positions taken by the finance manager and the neutral positions in the benchmark model - deviations that exist because the finance manager has integrated his or her own view on the foreign exchange markets when deciding the actual positions. However, many companies do not have an explicit benchmark model. As such, the extent of speculation has to be analyzed based on the extent to which the company's own view influences the exchange rate positions of the company (rather than looking at the deviations to a non-existing benchmark model).

The companies in this study were asked to state how often the company's view on exchange rates causes the company to take actions such as to (1) alter the timing of hedges, (2) alter the size of

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hedges, and (3) actively take positions in currency derivatives. The questions focus on to what degree speculation is pursued. By quantifying a “never” as 1, a “sometimes” as 2, and an “often” as 3, a speculation indicator is developed with a minimum of 3 and a maximum of 9.

Less than a quarter of companies never do any speculation. A majority of companies sometimes takes positions by altering hedges while only a minority often actively takes positions in currency derivatives. For an elaboration of the questions asked and the speculation indicator together with an overview of how the companies responded to the individual questions, please see Appendix 2.

The purpose of this analysis is to investigate which factors drive the extent of speculation. Three hypotheses are put forward as to ability (H4), relevance (H5), and value (H6):

Hypothesis 4 (ability):

A positive correlation exists between the size of the company and the speculation indicator.

In order to follow the foreign exchange markets in a professional manner certain resources have to be allocated. The relative burden of such an allocation falls with the size of the company. As such, it is expected that the size of the company contribute positively to the extent of speculation. Below consolidated turnover is used as a proxy for size (alternative proxies such as total assets lead to similar results).

Hypothesis 5 (relevance):

A positive correlation exists between foreign involvement and the speculation indicator.

Speculating is possible even if the company is not involved in foreign markets at all. However, in practical terms speculation (especially in the form of altering the size or the timing of hedges) is more relevant for companies that have a high degree of foreign involvement than for companies that only occasionally are confronted with exchange rate exposures. Furthermore, the degree of foreign involvement may also be a contributing factor to the degree of (perceived) expert knowledge in relation to the foreign exchange markets. As such, it is expected that the degree of foreign involvement contribute positively to the extent of speculation. Below the share of the consolidated turnover that is exported is used as a proxy for foreign involvement.

Hypothesis 6 (value):

A positive correlation exists between financial solvency and the speculation indicator.

Following the logic of Stulz (1996) three categories of companies exist in relation to risk. One category is in or close to a financial distress situation. Such companies have little to loose and are risk seekers. In the other end of the scale we have the very financially solid companies where speculation is a zero-sum game. Even if a large speculation loss occurs these companies will not experience a financial distress situation, which violates the rules of the zero-sum game. The last category is the companies in the middle, where speculation may lead to a financial distress situation. Such companies on average will loose in speculation cases. As such we imagine a form of bell shape response to speculation (the poor gain, the middle loose, and the rich do not care). However, as few (if any) companies in this sample are in or close to a financial distress situation, it is expected that the degree of financial solvency contribute positively to the extent of speculation. In bell curve language we only see the right hand side of the bell curve as relevant. The solvency ratio (equity / total assets) is used as a proxy for financial solvency.

Table 3 shows a regression analysis testing the three hypotheses. Apart from a constant and the three factors from the hypotheses above (consolidated turnover, export share, and solvency ratio) economic sector dummies are included following the same reasoning as for Table 2.

Table 3 Regression analysis for Speculation Indicator ¹

Independent variables:	Coefficients ²
Constant	4.09 ***
Consolidated turnover (mill. DKK)	0.000038 **
Export share (Export / Turnover)	1.97 ***
Solvency ratio (Equity / Total assets)	-0.74
Sector 15 dummy	1.86 **
Sector 25 dummy	0.83
Sector 30 dummy	0.37
Sector 35 dummy	0.34
Sector 45 dummy	0.65
Sector 55 dummy	-1.64
R-Squared	0.38

¹ Sample consists of 52 companies, included observations 51, excluded observations 1.

² Level of significance is indicated below the coefficient (1%:***, 5%:**, 10%:*)

From Table 3 we can conclude that hypothesis 4 and 5 are accepted at a 5 per cent and a 1 per cent level of significance respectively. As such, the size of the company (consolidated turnover) and the degree of foreign involvement (export share) do seem empirically to favor a large degree of speculation in exchange rate exposure management in Danish non-financial companies.

The financial solvency as measured by the solvency ratio is far from being significant. The tendency to depress speculation more in companies that are not that financially solid than in companies that are very financially solid is not empirically supported. A possible explanation is that the bell shape advocated in relation to the contribution of financial solvency to the speculation tendency is in fact correct and that the companies in the sample cover the whole spectrum of the bell shape and not only the more or less linear right hand side of the bell. Another explanation is that the financial solvency of the companies does not differ sufficiently to capture any contribution to speculation. If that is the case the solvency ratio as measured by equity / total assets is a bad proxy for financial solvency because this proxy actually differs a lot between the companies as Table 1 showed. A final and possible explanation is that although theoretically arguable there is in fact no actual connection between financial solvency and speculation in non-financial companies.

As to economic sector dummies one such dummy stands out to be significantly different from zero at a 5 per cent level of significance. The companies in Materials (Chemicals, Construction Materials,

Containers & Packaging, Metals and Mining, and Paper & Forest Products) seem to be significantly more inclined to speculate than companies in other sectors. At least seen in retrospect Materials being an outlier is not too surprising.

The companies in Materials are used to products and raw materials with considerable price fluctuations. For many of these products and / or raw materials more or less formalized markets exist. That is to say that the finance managers of these companies are used to dealing with a whole range of different risks, where exchange rate risk is only one of many. As such, the finance managers almost per definition will have an active approach towards risk management. Especially so because in some of these markets (not the foreign exchange market) the company may in fact possess superior knowledge given the position in the market. This tendency to be able to beat - at least on average - some of the markets can have a (unjustified) spillover effect to the attitude towards the foreign exchange market.

5. Conclusion

The empirical results of this study are based on questionnaires sent to Danish, non-financial companies. The two main topics addressed in this paper are the questions of benchmarking and speculation in relation to exchange rate exposure management. The companies in the study show a wide variety of attitudes towards the two related topics. Regression analyses are made in order to address and understand the likely causes for this variety in attitudes.

It is empirically supported that the larger the company (ability) and the larger its relative sale on foreign markets (relevance), the more likely the company will be to benchmark its exchange rate exposures. Similarly and even more significantly so it is empirically supported that the larger the company (ability) and the larger its relative sale on foreign markets (relevance) the more likely the company will be to speculate. No correlation is found between financial solvency (value) and benchmarking / speculation. The economic sector to which the company belongs only seems to play a significant role in relation to Materials where the companies tend to speculate more than average.

Empirical studies show that companies in small, open economies tend to be more active derivative users than their US counterparts. As Denmark is a small open economy it is unlikely that the observed extent of benchmarking and speculation found in this study for a typical Danish company is transferable to e.g. a US company. However and more importantly, we see no reason why the conclusions in this paper as to which factors drive the extent of benchmarking and the extent of speculation should not apply to other European companies. This remains of course to be empirically tested.

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Appendix 1

In this Appendix it is examined whether the classification of firms (GICS) and the size of the company (consolidated turnover) 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.

GISC NO.

Table A1. Observed values

GICS	no	yes	Total
15	3	5	8
20	31	19	50
25	14	7	21
30	4	5	9
35	3	9	12
45	8	6	14
50	1	0	1
55	1	1	2
Total	65	52	117

Expected values

GICS	no	Yes	Total
15	4.4	3.6	8.0
20	27.8	22.2	50.0
25	11.7	9.3	21.0
30	5.0	4.0	9.0
35	6.7	5.3	12.0
45	7.8	6.2	14.0
50	0.6	0.4	1.0
55	1.1	0.9	2.0
Total	65.0	52.0	117.0

Test for independence

GICS	no	yes	
15	0.47	0.59	
20	0.37	0.47	
25	0.47	0.58	
30	0.20	0.25	
35	2.02	2.52	
45	0.01	0.01	
50	0.36	0.44	
55	0.01	0.01	
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?

Table A2. Comparison of two groups.

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 +/- 1.96². The conclusion is, that the group with GISC no. 35 is more likely to respond to the questionnaire than expected.

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) => 7. The test is done as a right-tailed test (because of the characteristics of the distribution) with a significance level of 0.05.

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.

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TURNOVER

Table A3. Observed values Expected values Test for independence

Turnover (mill. DKK)	Observed values		Total	Turnover (mill. DKK)	Expected values		Total	Turnover (mill. DKK)	Test for independence		
	no	yes			no	yes			no	yes	
0-249	15	9	24	0-249	13.3	10.7	24.0	0-249	0.21	0.26	
250-499	12	4	16	250-499	8.9	7.1	16.0	250-499	1.09	1.36	
500-999	12	10	22	500-999	12.2	9.8	22.0	500-999	0.00	0.01	
1000-2499	11	9	20	1000-2499	11.1	8.9	20.0	1000-2499	0.00	0.00	
2500-4999	7	10	17	2500-4999	9.4	7.6	17.0	2500-4999	0.63	0.79	
5000-	8	10	18	5000-	10.0	8.0	18.0	5000-	0.0	0.50	
Total	65	52	117	Total	65	52	117.0	Total	2.34	2.92	5.25

Summarized the deviations equals 5.25 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?

Table A4. Comparison of two groups.

Turnover (mill. DKK)	p1	p2	p-hood	var. P1	var. P2	var. p1 + var. p2	Std.dev	Z obs.
0-249	0.2308	0.1731	0.0577	0.0027	0.0028	0.0055	0.0742	0.7775
250-499	0.1846	0.0769	0.1077	0.0023	0.0014	0.0037	0.0608	1.7713
500-999	0.1846	0.1923	-0.0077	0.0023	0.0030	0.0053	0.0728	-0.1057
1000-2499	0.1692	0.1731	-0.0038	0.0022	0.0028	0.0049	0.07	-0.0549
2500-4999	0.1077	0.1923	-0.0846	0.0015	0.0030	0.0045	0.0671	-1.2610
5000-	0.1231	0.1923	-0.0692	0.0017	0.0030	0.0046	0.0678	-1.0211

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

Appendix 2

Benchmark Indicator

The question below forms the basis for the benchmark indicator.

Do these statements characterize the hedging policy of your company?

(Please check (X) the appropriate boxes)

	No (1)	Yes (2)	Total
A benchmark model lists neutral positions and limits for deviations	68%	32%	100%
The hedging policy (and the benchmark model if any) is presented for and approved by the senior management	14%	86%	100%
The hedging policy (and the benchmark model if any) is presented for and approved by the board of directors	27%	73%	100%
Performance measurement of exchange rate exposure management is important	45%	55%	100%
The performance of the hedging decisions is measured against the neutral positions of a benchmark model	70%	30%	100%

The number in parenthesis is the contribution to the Benchmark Indicator (minimum = 5, maximum = 10)

The percentages show how the 49 companies (3 companies did not respond to all statements) responded to the different statements. The average score (No = 1, Yes = 2) is 7.8, the median score is 8, the minimum score is 5, and the maximum score is 10.

Speculation Indicator

The question below forms the basis for the speculation indicator.

How often does your company's view / forecast of exchange rates cause your company to take these actions?

(Please check (X) the appropriate boxes)

	Never (1)	Sometimes (2)	Often (3)	Total
Alter the timing of hedges	27%	54%	19%	100%
Alter the size of hedges	23%	63%	13%	100%
Actively take positions in currency derivatives	39%	45%	16%	100%

The number in parenthesis is the contribution to the Speculation Indicator (minimum = 3, maximum = 9)

The percentages show how the 51 companies (1 company did not respond to all actions) responded to the different actions. The average score (Never = 1, Sometimes = 2, Often = 3) is 5.6, the median score is 6, the minimum score is 3, and the maximum score is 9.