

**Exchange Rate Exposure Management:
An Empirical Study into the
Strategies of Industrial Companies**

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Abstract

This cross-case study of eight blue-chip industrial companies extends previous studies of *why* exchange rate exposure management is done the way it is.

While hedging should not be pursued unless it creates value, the operational objectives differ among companies. Avoiding financial distress is considered one of the most important ways of adding value by hedging. However, reducing stakeholders perceived risk and improving the ability to pursue investment plans and make value adding investments do also get some attention. While the overall objective is to add value, the dominating object for management is cash flows and less so accounting earnings. That accounting earnings do receive attention is linked to the possibility of reducing stakeholders perceived risk.

In practice there is a focus on short-term cash flow exposures as opposed to the more long-term operating exposures. The study shows that major reasons behind this focus are the dynamic development of the competitive environment and the ability of the specific company to counter unfavorable changes in exchange rates by the exercise of real options (e.g. reallocation of production resources). As such, the study shows the inadequacy in taking a partial and static financial approach when making theoretical recommendations for managing exchange rate exposures in industrial companies.

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1. Introduction

The finance literature prescribes exchange rate exposure management to focus on operating exposure (e.g. Rawls and Smithson., 1990). However, empirical studies (e.g. Bodnar, Marston, and Hayt 1998) have shown that exchange rate exposure management seems to focus on transaction exposure and only that part of operating exposure, which is made up of (short-term) anticipated transactions. The competitive exposure element of operating exposure receives little attention in real-life exchange rate exposure management.

Why does this difference in the recommendations of the finance literature and in real-life strategies exist in relation to exchange rate exposure management?

Some authors find that finance managers have a less clear understanding of operating exposure than of the more straightforward transaction and translation exposure (Malindretos and Tsanacas, 1995). This could explain the real-life tendency to emphasize the management of short-term cash flow exposures. However, other authors find that most theoretical work on corporate risk management has focused too much on particular risk exposures to the exclusion of other interrelated exposures (Miller, 1998). As such, a possibility is that the theoretical recommendations of the finance literature are not adequate because they fail to reflect the real-life setting for exchange rate exposure management.

A problem in understanding the reason behind the discrepancy between the theoretical recommendations and the observed strategies is the lack of literature on the practical

problems involved in managing exchange rate operating exposure. Most empirical findings are based on closed-end questionnaires - the result of which is adequate in *reporting* strategies (how) but which is often insufficient in *understanding* strategies (why).

This empirical cross-case study into the strategies of industrial companies in relation to exchange rate exposure management is based on the premises

- (1) that academia needs a profound understanding of the reasons behind the strategies observed in practice in order to be able to make valuable contributions and
- (2) that academia does not have such a profound understanding at present.

Thus, the primary aim of this empirical study into the strategies of industrial companies in relation to exchange rate exposure management is to create an understanding of the reasons behind these strategies.

Different approaches to create such an understanding exist. One approach (e.g. Géczy, Minton and Schrand, 1997; Goldberg et al., 1998) is to examine linkages between various “objective” company characteristics (accounting measures, ownership structures, export ratios, etc.) and the use of hedging instruments in order to deduct or confirm likely reasons for exchange rate exposure management. Another approach is to actually ask the companies for the likely reasons. This can be done by the use of a (predominantly closed-end) questionnaire sent to a fairly large number of companies (e.g. Joseph and Hewins, 1997) or by examining on a case-study basis the corporate setting for a specific company (e.g. Lewent and Kearney, 1990). This study belongs to the second approach.

According to Froot, Scharfstein and Stein (1993) a single, accepted framework for guiding hedging strategies does not exist. As such, closed-end questionnaires may fail to capture the diversity of complexities and interdependencies that lie behind given strategies. On the other hand, an in-depth case study as the much-cited study of Merck by Lewent and Kearney does exhibit these complexities and interdependencies but only for a particular company.

This study is a cross-case study of the eight largest industrial companies listed on the Copenhagen Stock Exchange. As such, it contributes to the existing literature on exchange rate exposure management by articulating through questionnaires and interviews the strategies of a *group* of companies - a group that has been defined using objective criteria (blue-chip, industrial, listed on Copenhagen Stock Exchange). The aim of this approach is to capture the diversity and the complexity of practical exchange rate exposure management without restricting the evidence to any one particular company.

The study shows that exchange rate exposure management cannot be treated as an isolated element in the overall management process. Theoretical recommendations based on a partial and static approach are not valid (the tail should not wag the dog). In practice exchange rate exposure management should be an integrated part of the overall management process incorporating the dynamic development of the specific markets and the dynamic ability of the specific company to undertake real actions. The importance of these dynamics were fully revealed during the informal interviews and served as a good explanation for (1) some of the differences that are apparent in the responses to the closed-end questions and (2) some of the discrepancy between theoretical recommendations and real-life strategies.

Putting exchange rate exposure management in a more holistic (as opposed to a strictly financial) perspective adds complexity to managing exchange rate exposures by financial hedging. This seems to be one of the reasons for the overwhelming focus on short-term cash flow exposures, which is apparent in this study. Another reason is the fact that in managing exchange rate exposures financial hedging is only one remedy – the relative importance of which falls over the time horizon considered.

The remainder of this paper is organized as follows. Section 2 gives a short overview of the empirical literature on exchange rate exposure management. Section 3 lists the methodology of the study. Section 4 is dedicated to the results of the study. Section 5 concludes.

2. Literature Overview

A number of surveys on exchange rate exposure management have been conducted (e.g. Bodnar, Marston and Hayt (1998); Dolde (1993); Malindretos and Tsanacas (1995)). All these surveys are based on questionnaires dominated by closed-end questions. A general finding is that in hedging exchange rate exposures focus is on transaction exposure and anticipated cash flows within one year rather than on anticipated cash flows beyond one year, competitive exposure, or translation exposure. Even for the exposures that receive the highest focus hedging is normally not done in order to eliminate an exposure. Rather partial hedging appears to be the normal practice. Consistent with the focus on near-term and directly observable exposures companies tend to concentrate their foreign currency derivative usage at the short horizon. When using derivatives for exchange rate exposure management a majority of the companies incorporate their own view on the market.

Studies covering non-US companies (e.g. Alkeböck and Hagelin (1999); Berkman, Bradbury and Magan (1997); Bodnar and Gebhardt (1998); Hakkarainen, Joseph, Kasanen and Puttonen; Joseph and Hewins (1997)) show the same general conclusions. However, companies in small, open economies tend to be more active derivative users than their US counterparts.

The above studies are restricted by the fact that they are results of responses to questionnaires with closed-end questions. Such a quantitative approach does facilitate aggregation of data, but may fail to capture a deep and more qualitative understanding of the problems related to exchange rate exposure management.

An exception may be Joseph and Hewins (1997) who particularly concentrate on examining the motives behind corporate hedging in their questionnaire survey on UK multinational corporations. Joseph and Hewins find that the primary object for corporate hedging is cash flows. The hedging motives appear to be influenced by the management's perceptions of stakeholders' attitudes to risk and financial market behavior. Joseph and Hewins find a relatively weak emphasis on the financial distress motive.

A much-cited case study of the strategies and practices in relation to exchange rate exposure management in a specific company is the one of Lewent and Kearney (1990). After a brief introduction to the industry and the company - a US based pharmaceutical company, Merck - the authors analyze how Merck's exposures to changes in exchange rates are identified and measured, which factors are considered in deciding whether to hedge such risks, and the financial hedging program established by Merck.

3. Methodology of Study

The results of this cross-case study are based on interviews with finance managers / treasurers in the eight blue-chip industrial companies listed on the Copenhagen Stock Exchange as of the end of 1997.

3.1. Method

If the question of “how” were dominant in this paper, data from questionnaires would be sufficient. However, qualitative data from informal interviews are particularly useful for understanding “why”. Following Eisenhardt (1989), when a relationship is supported by quantitative data, the qualitative data often provide a good understanding of the dynamics underlying the relationship, that is, the “why” of what is happening.

To facilitate the aggregation of data the informal interviews were supplemented with closed-end questionnaires filled out during the interviews (triangulation). As such, the study is a special contribution to understanding the strategies of industrial companies in relation to exchange rate exposure management.

3.2. Sample

As a result of the concerns as to the qualitative as well as to the quantitative element of the study, it was decided to let the sample be composed of blue-chip industrial companies listed on the Copenhagen Stock Exchange (CSE) as of the end of 1997. Such a sample meets the demand from the quantitative element of the study by selecting the sample through some

general, objective criteria (blue-chip, industrial, listed on CSE). On the same time the sample meets the demand from the qualitative element of the study (listed companies are publicly oriented; blue-chip companies are large; Danish industrial companies are internationally oriented).

The blue-chip industrial companies listed on CSE as of the end of 1997 consist of eight companies as shown in table 1. Their combined market value as of the end of 1998 represents more than 60% of the total market value of the industrial companies listed on the CSE.

Put Table 1 here

The eight companies in table 1 cover a broad specter of branches producing a variety of products (beer, cement, enzymes, food ingredients, pharmaceuticals, roads, soft drinks, sugar, telecommunication equipment, televisions, etc.). The companies have an average turnover of USD 2.1 billion and an average market value of USD 2.5 billion.

All companies are heavily internationally oriented as two thirds or more of the turnover of each company originates from foreign markets according to the latest published accounts (1997/1998 and 1998). The companies were all subject to a quantification of their exchange rate exposure under a stock market approach in an analysis performed for the period 1990-1998 (Aabo, 1999). For more than half of the companies the analysis showed significant extra-market exchange rate exposures when regressing the return of the individual stocks on the return of the stock market index and on the returns of five important currencies.

Finance managers from the companies were approached in February / March 1999 and by the privilege of genuine interest and good will all companies agreed to participate in the study.

3.3 Interviews

The interviews with the finance managers (in the following the term finance managers will be used as a synonym for finance managers / treasurers) were conducted in the first half of 1999. The companies in the study were promised confidentiality. As such, it was not possible to fully exploit within-case data to place the exchange rate exposure management aspect in a broader strategic perspective in each company. Rather, the focus had to be directed towards more selective aspects of the management process in order to obey the confidentiality. Together these selective aspects in a number of companies would then generate the desired understanding of the “why” question.

All interviews were conducted in person at the company site (the only exception to the procedure was due to the inability of a particular interviewee to actually be present in the office - in this case the questionnaire was sent by mail and subsequently a two-hour telephone meeting was held). The duration of the interviews spanned from 1.5 hours to 2.75 hours with an average interview lasting 2 hours. All interviews followed the same protocol. The first and major part of the interview was an informal interview on the company’s exchange rate exposure management (the qualitative part) while the last and minor part of the interview was the filling out of the closed-end questionnaire containing twelve closed-end questions (the quantitative part).

After each interview minutes and a filled-out questionnaire were sent to the interviewee(s) in order to facilitate revisions in case of misunderstandings. Three companies asked for such revisions. Accordingly revised versions of the minutes were sent to the companies in question. In order to provide further scope for feedback the first version of this paper was sent to the interviewees of the eight companies.

4. Results of Study

The results of the study are based upon interviews with finance managers in the eight blue-chip industrial companies listed on Copenhagen Stock Exchange as described in the previous section. The questionnaire that was filled out during the interviews is available on request.

Because this study focuses on the “why” question and because the responses to the questionnaire show that the companies in this study do not differ markedly from companies in other studies (focus on transaction exposure and anticipated cash flows within one year, partial hedging, concentration of foreign currency derivative usage at the short horizon, and incorporation of own view on the market) these more trivial results are not elaborated below. Rather the focus is on the objective for management (4.1.), the object for management (4.2.), and reasons for not hedging operating exposure (4.3.).

4.1. Objective for management

The ultimate goal of hedging must be to somehow add value. Rawls and Smithson (1990) argue that the fact that a company is confronted with risk is only a necessary condition for

actually trying to manage the risk. It is not a sufficient condition. Or as Froot (1994) puts it, if hedging cannot raise the value of a company, then hedging should not be pursued.

Figure 1 shows that the most likely way that the companies in this study expect hedging to add value is through avoiding financial distress. This is in accordance with the finance literature (e.g. Levi and Sercu, 1991) that stresses that because of imperfections in various markets hedging may increase future cash flows by avoiding or reducing financial distress. As such, Stulz (1996) emphasizes the elimination of costly lower-tail outcomes as a relevant objective.

Put Figure 1 here

However, two companies indicated that avoiding financial distress is not important at all in adding value. The reasons behind the two latter companies' refusal of avoiding financial distress as a way of adding value through hedging differ.

Thus, *Company One* concentrates its hedging activities on reducing volatility of cash flows in the near term. This is not done in order to avoid financial distress but in order to give the upper management of the company the stability in the near term that is needed to think strategically. In this way the hedging policy of *Company One* facilitates that in addressing the consequences of changing exchange rates the management can devote its resources to long term real decisions (like cost cutting, outsourcing, establishing new markets). Rather than through avoiding financial distress, *Company One* indicated that the way, that it expects

hedging to add value is through improving the ability to pursue investment plans and make value adding investments.

Company Two does not consider the direct cash flow effects from changing exchange rates to be crucial. As such, avoiding financial distress is not the way that *Company Two* expects hedging to add value. Rather, *Company Two* focuses its hedging activities on reducing volatility in accounting earnings and meeting the expectations of the stock market. In deciding the appropriate hedges the budgets and meeting the budgets are crucial factors. Rather than through avoiding financial distress, *Company Two* indicated that the way, that it expects hedging to add value is through reducing the stakeholders' perceived risk.

Although Figure 1 shows that the most likely way that companies expect hedging to add value is through avoiding financial distress, two other ways of adding value are also considered of some overall importance.

Company One above indicated that improving the ability to pursue investment plans and make value adding investments is the only and thus most important way of adding value. Furthermore, three companies put second priority on this way of adding value.

The reasoning is related to the thoughts of Froot, Scharfstein, and Stein (1993), who write in a framework of capital market imperfections where externally obtained funds are more expensive than those generated internally. Hedging may add value by reducing or optimizing the cash flow fluctuations caused by changing exchange rates and thus create room for pursuing the optimal investment strategy. Looking more broadly, hedging may add value

simply by reducing short-term noise and letting the management concentrate on the optimal investments in the long term.

Company Two above indicated that the only and thus most important way that it expects hedging to add value is through reducing stakeholders' (shareholders, employees, customers, etc.) perceived risk. Furthermore, four more companies put either first, second, or third priority on this way of adding value.

The reason behind this result is related to the concept of information asymmetry as put forward by Myers and Majluf (1984) and Jensen and Meckling (1976). If all stakeholders had perfect information, there would be no reason to focus on the perceived risk of these stakeholders - neither clarification nor manipulation by hedging would serve any purpose. Pointing out the relevant stakeholders in this concept two stakeholders significantly stand out - the shareholders and the banks.

Some companies focus on meeting the expectations of the stock market and thus not let fluctuations caused by changing exchange rates disturb the fulfillment of these expectations if such disturbances could have been avoided by proper hedging decisions. One might then think that these companies would also be focused on not disappointing the banks (lenders).

However, *Company Three* that does sometimes hedge in order to show stability and meet the expectations of the shareholders and the stock market analysts specifically mentioned that the banks are not so important in this aspect because of long lasting relationships.

Contrarily, *Company Four* thinks that properly handling the effects from hedges on the accounts may add value by improving the rating of the company at the financial institutions. This rests on asymmetric information in relation to financial institutions.

Nance, Smith and Smithson (1993) note that hedging may reduce taxes if the company's effective tax schedule is convex. None of the companies in this study expects to add value by reducing taxes. This result shall be seen in connection with the flat company tax rate in Denmark. No companies wanted to indicate other ways of adding value by hedging than the four predetermined categories.

Conclusively, avoiding financial distress is considered the most important way of adding value by hedging. However, reducing stakeholders perceived risk and improving the ability to pursue investment plans and make value adding investments do get some attention as well.

4.2. Object for management

The recent finance literature is quite unanimous in recommending that the object for management should be cash flows (e.g. Levi and Sercu, 1991, and Froot, Scharfstein, and Stein, 1993) although the older finance literature focused on the market value of the firm (e.g. Adler and Dumas, 1984). Accounting concerns are generally not considered a valid object for management.

Figure 2 shows that in accordance with the recent finance literature most companies try to manage volatility in cash flows when hedging. Thus six companies ranked volatility in cash flows as the most important object for management.

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However, Figure 2 also shows that volatility in accounting earnings does get some attention although not as much as volatility in cash flows. Although only two companies ranked volatility in accounting earnings as the most important object for management, three other companies gave it a second priority.

The relative success of volatility in accounting earnings - unwarranted according to the finance literature - shall be seen in conjunction with the discussion above concerning the reduction of the stakeholders' perceived risk as a way of adding value. Thus, four of the five companies that attach importance to managing volatility in accounting earnings also expect to add value by reducing the stakeholders' perceived risk.

Only sporadic importance is attached to managing balance sheet accounts / ratios or the market value of the firm. The lack of focus on the market value of the firm as an important object for management seems to be in accordance with the redirected focus in the finance literature - from a focus on the market value to a focus on the cash flows of the company.

4.3. Reasons for not hedging operating exposure

In understanding the strategies of industrial companies in relation to hedging exchange rate operating exposure, one of the best ways to reveal the fundamental thinking of the companies

may not be to ask why an operating exposure is hedged but rather to ask why an operating exposure is *not* hedged.

In the financial literature one of the main reasons for not hedging operating exposures by financial means is that financial hedging is inadequate to address the real problems of operating exposures. As such, Cornell and Shapiro (1983) argue that the major burden of exchange risk management must fall on the shoulders of marketing and production executives.

Figure 3 shows the likely reasons why the companies in this study sometimes or frequently do not hedge an operating exposure.

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The most likely reason for not hedging - sometimes or frequently - an operating exposure financially is that operating exposure is managed by real means such as changes in sourcing and production. All companies indicated that this reason was important to a degree varying between the most important reason to the third most important reason. The result is in line with the line of reasoning by Cornell and Shapiro as stated above.

In their focus on real means (or real options) as a way of addressing the problems of managing exchange rate operating exposures the companies further distance themselves from the theoretical picture of static companies. Thus, the dynamics of the companies take over or

at least supplement financial hedging as remedies in managing operating exposures. This is an explanation to the fairly short time horizons that the companies take into consideration when analyzing whether or not to hedge an operating exposure.

Company One points out that a main reason why they do not hedge competitive exposure is that such an exposure is managed by real means. This may be by buying foreign companies or otherwise establishing presence in foreign markets. A recent purchase of a foreign company was mentioned as being partly motivated by a longsighted foreign exchange strategy.

Company Two concentrates its financial hedging of operating exposures on the short-term exposures like anticipated transactions within one year. The longer the time horizon, the more likely it will be that real means like outsourcing or establishing production in another country act as real hedges to the exchange rate exposures. *Company Two* mentioned that in some instances it could establish production in a foreign country within a year without any problems.

As such, the main reason when the companies in this study choose not to hedge an operating exposure is that the latter is fully or partly covered by the possibility of making real changes (e.g. relocation of production). The possibility of making real changes should indeed be taken into account according to the financial literature. But financial hedging may be left with too little room for maneuvering because the aspect of real means is overvalued. Changing the operations of the company may be a long and costly process.

This leaves room - at least as a relevant supplement - for addressing the problem of managing exchange rate operating exposure by the use of financial means such as financial

derivatives or local currency financing. Financial means are much more flexible than real means. Therefore financial policies are well suited in achieving strategic exchange risk management objectives according to Glaum (1990). In line with the supplementary line of reasoning Capel (1997) argues that financial hedging may be used to buy time for adjustments in the real sphere.

Other reasons for not hedging operating exposure stand out as well. The second most important reason stated by the companies is that the operating exposure is not significant. In fact three companies indicate that the insignificance of operating exposure is the primary reason for not hedging operating exposure. However, the arguments behind this insignificance differ.

In the case of *Company Three* and *Company Four* the argument of insignificance rests on geographically dispersed production and subsidiaries that are financed in local currency. However, in the case of *Company Five* the argument of insignificance rests - at least partly - on high margins and thus the ability to absorb the effects of an adverse exchange rate development. Roughly speaking *Company Three* and *Company Four* reduce operating exposure by actions and find the remaining operating exposure to be insignificant while *Company Five* confronts the operating exposure and finds this exposure insignificant compared to the margins on its products.

Other reasons for not hedging operating exposure also receive some attention. The third most important reason stated by the companies was the problem of quantifying operating exposure. One company finds this to be the primary reason why it sometimes or frequently does not

hedge an operating exposure while two companies find this to be the second most important reason.

That the problem of quantification receives some attention is in accordance with the finance literature and is illustrated by the problems in identifying competitors and estimating their likely reactions to changing exchange rates. Pringle (1991) actually argues that quantifying operating exposure is *the* biggest problem in managing operating exposure. There seems to be two competing reasons why the problem of quantification does not attract more attention in this study. Either the companies in this study are particularly successful in quantifying operating exposure. Or the companies in this study do not dedicate enough analytical resources to actually discover how complicated a quantification is.

Other reasons that were indicated in order to explain why the company sometimes or frequently does not hedge an operating exposure are concerns about the effect from hedging on the accounts / taxes and the cost of hedging.

Conclusively, by far the most important reason why the companies in this study sometimes or frequently do not hedge an operating exposure is that the operating exposure is managed by real means. However, other reasons also received attention - including insignificant operating exposure and the problem of quantifying operating exposure.

5. Conclusions

Hedging should not be pursued unless such hedging creates value. This cross-case study shows that avoiding financial distress is considered the most important way of adding value by hedging. As a fairly close number two and three come reducing stakeholders perceived risk and improving ability to pursue investment plans and make value adding investments. The focus on financial distress is in contrast to the empirical findings of Joseph and Hewins (1997) covering UK multinationals. Although the present cross-case study covers only a limited number of companies, the divergence seems striking.

While the overall objective is to add value, the dominating object for management is cash flows - in accordance with the theoretical literature. However, contrary to theory a close number two is accounting earnings, which shall be seen in conjunction with the possibility of reducing stakeholders perceived risk.

The study shows that major reasons for the focus in practice on short-term cash flow exposures as opposed to the more long-term operating exposures are the dynamic development of the competitive environment and the ability of the specific company to counter unfavorable changes in exchange rates by real actions (e.g. relocation of production resources). As such, the study shows the inadequacy in taking a partial and static financial approach when making theoretical recommendations for managing exchange rate exposures in industrial companies. Dolde (1993) finds a distinct evolutionary pattern in which early risk management attempts tend to be prompted by concerns about particular transactions while over time many companies progress to more systematic risk management of ongoing competitive exposures. The industrial companies in this study may be in such a transition.

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Table 1 Industrial Companies in Study

Company ¹	Turnover of Company ² (Mill. USD)	Total Market Value of Company ³ (Mill. USD)
Bang & Olufsen Holding a/s	490	747
Carlsberg A/S	4,608	3,726
Coloplast A/S	428	1,324
Danisco A/S	2,955	3,287
FLS Industries A/S	3,377	942
GN Store Nord as	636	1,330
Novo Nordisk A/S	2,815	8,570
Superfos a/s	1,264	455
Total	16,572	20,381
Average	2,072	2,548

¹ All blue-chip (KFX) industrial companies listed on CSE as of the end of 1997.

² Turnover according to latest published accounts (1997/1998 or 1998) and a DKK/USD exchange rate as of the end of 1998: 6.3637

³ Values as of the end of 1998. Fact Book 1999, Copenhagen Stock Exchange (CSE). Related stocks (A-shares and sister companies) listed on CSE are included. A-shares that are not listed on CSE are not included (B&O and Novo Nordisk). DKK/USD exchange rate as of the end of 1998: 6.3637

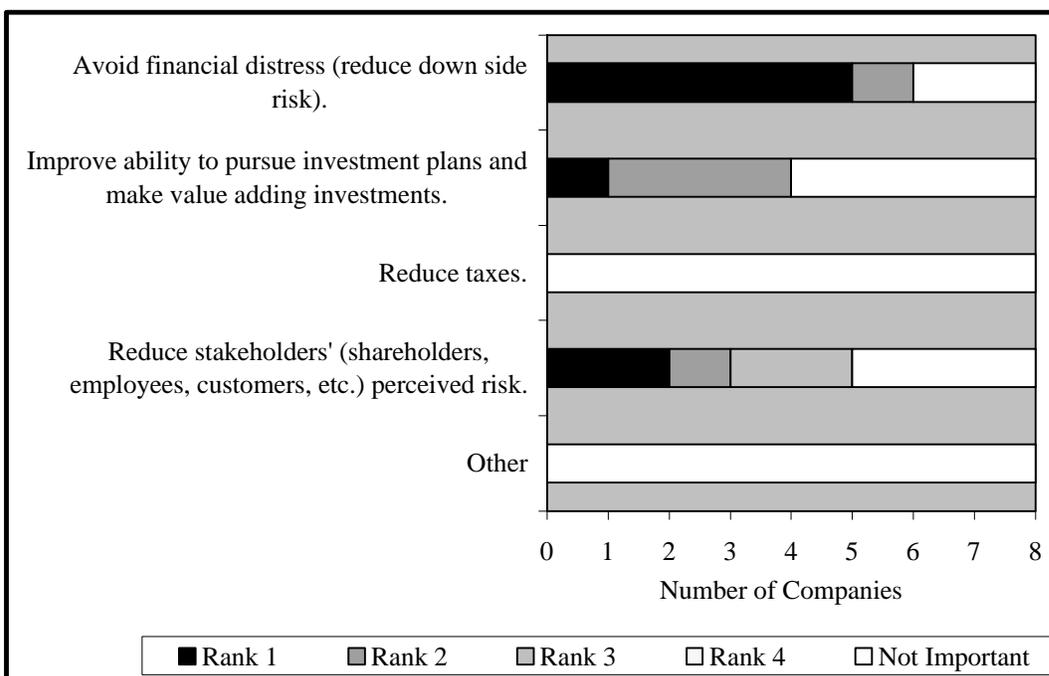
Figure 1 Objective for Management

Figure 2 Object for Management

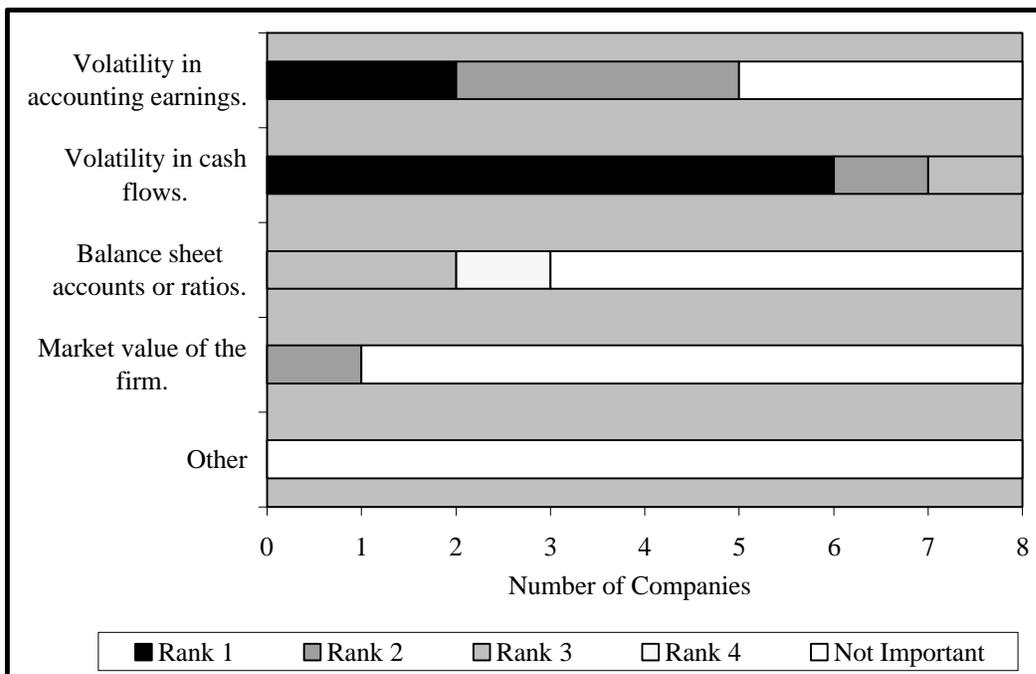


Figure 3 Reasons for not Hedging Operating Exposure

