

Managing Strategic Exchange Rate Exposures: Evidence from UK Firms

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Abstract

The effect of exchange rate movements on firm value is important to firms engaged in international transactions. These accounting exposures can be managed using financial instruments. However, the competitive or strategic effects that create economic exposure require firms to adopt a strategic approach. This paper reports on the extent to which large, publicly-listed UK firms adopt a strategic approach to the management of exchange rate risk. Unlike earlier studies, the results indicate the widespread use of a range of operational hedging techniques. A significant proportion of firms are also found to incorporate currency risk management as a factor in decisions made by their operating departments. However, the study also indicated considerable variation in the application of operational techniques between firms and industry sectors.

Key words: economic exposure, competitiveness, operational hedging, strategic risk management

Introduction

A recognised objective of financial and corporate management is to maximise shareholder value (Rappaport, 1986). The increasing economic integration and development of global markets means that few companies, if any, are unaffected by currency movements. Unexpected changes in exchange rates affect firms' ability to sell abroad, increase the cost of foreign-sourced inputs, and reduce their domestic and international competitiveness. Firms involved in international trade are subject to transaction risk arising from payables and receivables in foreign currencies. In addition, multinational firms with operations in several countries will have translation risks from having assets and liabilities denominated in foreign currencies. Economic exposure includes these accounting effects but also incorporates the competitive situation of the firm (Shapiro, 1992). Even firms not subject to accounting exposures, by only sourcing in and servicing in their domestic markets, face economic currency exposure (Adler and Dumas, 1984).

Flood and Lessard (1985) provide a framework for analysing a firm's competitive position and the extent of its economic exposure. In their model, firms are categorised as having either high or low sensitivities to changes in exchange rates for their inputs or prices, or both. Firms which have a mismatch between their costs and price sensitivities, the exporter and importer firms in Flood and Lessard's terminology, have the greatest degree of economic exposure. Firms which have either high or low sensitivities to both costs and prices, that is, multinational firms, importers with common costs or protected domestic producers sourcing locally, have low economic exposures. This assessment of firms' economic exposure has been developed and extended by Pringle (1991), Pringle and Connolly (1993), and Miller (1998) to categorise the direct, transactional effects, and the indirect, competitive effects.

In seeking to manage economic exposure, firms can adopt either operational or financial hedging strategies, or more typically a combination of both (Srinivasulu, 1981; Aggarwal and Soenen, 1989, and Soenen and Madura, 1991). However, the ability of financial instruments, such as foreign currency forward contracts and options, to hedge long-term currency exposures is limited. This arises because the economic exposure leads to the underlying cash flows being uncertain and not just the exchange rate at which they will be converted (Glaum, 1990; Grant and Soenen, 1991). In particular, financial hedging cannot prevent a company's competitive position being eroded by a strengthening domestic currency.

Operational hedging involves firms in decisions as to the location of their production facilities, sourcing of inputs, the nature and scope of products, the firm's choice of markets and market segments, and strategic financial decisions, such as the currency denomination of the firm's debt. The objective is to match the input and output sensitivities so as to reduce the degree of exposure (Rawls and Smithson, 1990). Moffet and Karlsen (1994) describe the use of production, financial and marketing policies to manage economic exposures as 'natural hedging'. There is empirical evidence for this approach and, insofar as firms can implement appropriate internal solutions, these will be adopted. Broder (1984) in a survey of the top 250 listed UK companies found that less than a quarter of responding firms made operational decisions without considering the effects of currency exposure. Holland (1992) argues that correctly managing foreign exchange risk will not compromise the objective of shareholder wealth maximisation. His case study of 14 internationally involved UK companies highlighted the fact that many of the firms had a degree of freedom when formulating and revising production, financing and marketing decisions and used these in the first instance to manage their exposures. However, he concluded that in the final analysis many companies selected inflexible operational strategies in order to benefit from factor market competitive and comparative advantages. Exchange rates were therefore only one of a number of strategic factors that needed to be considered. However, he concluded that the operational approach was particularly useful when applied to difficult-to-predict, longer-term currency cash flows. Dolde (1993) makes the case that the advantages in economies of scale in production and distribution and the transaction costs involved in making changes significantly limit the feasibility of complete operational hedges. Edelshain (1995), in a survey of large UK companies, found that switching suppliers to take advantage of currency effects was not widespread, with only 4 per cent of his sample moving away from strong or strengthening currencies.

A key element of strategic exposure management is the extent to which operating departments are actively involved in managing these strategic risks. In order to make use of operational hedges, the responsibility for foreign exchange risk management cannot be solely a financial responsibility (Cornell and Shapiro, 1983; Aggarwal and Soenen, 1989). Operating departments must view the impact of currency movements as an important strategic consideration to be included in the long-term planning decision rather than a risk to be hedged on a reactive basis. Edelshain (1995) suggests that relatively few companies use operational hedges to manage currency exposure because in most companies the management of exchange rate risk is allocated to the finance function.

Firms' economic exposure arises directly from revenues and costs denominated in foreign currencies. These transactional effects are relatively easy to identify and manage, especially over short time periods. The indirect effects, that is changes to the firm's competitive position, are less easy to manage. Ahkam (1995) highlighted the need for firms to

develop ways of measuring and managing economic exposure in its entirety. Miller (1998) argues that integrated risk assessment requires firms to analyse all aspects of the firm's position, competitive, input supply, market demand, and technological risks in assessing economic exposure.

This paper reports on the findings of a survey of finance directors of non-financial UK firms investigating the extent to which they adopt a strategic approach to managing exchange rate risk. Specifically, the study examines the extent to which a number of production, marketing, and financial strategies described in the literature are employed by responding companies. There is only limited research on this issue in comparison to the large number of studies examining the use of financial instruments in risk management (Bodnar, Gentry and Marston, 1996). Most research in this area has consisted of small scale, or individual, case studies (Belk and Glaum, 1990; Holland, 1992; Scott, 1987).

There are two large scale postal surveys on the lines of our research that have examined the extent to which corporations use operational hedging techniques. Cezairli (1988) surveyed the US Fortune 500 and a similar survey of the UK's Times Top 1,000 companies was carried out by Edelshain (1995). Both suffer from low response rates, but their findings, summarised in Table 1, do provide evidence on corporate practice. Their divergent approaches only allow some comparisons to be made, but suggest that only a proportion of larger firms are making use of operational methods to manage foreign exchange rate risks.

The rest of the paper is set out as follows. The next section outlines the methodology used in the survey. Section three presents the survey results while the final section presents some conclusions and suggestions for further research.

Research Methodology

A postal survey of all non-financial UK-listed firms in the EXTEL Financial database was carried out in March, 1996. A major concern in the survey was to avoid the low response rate that prevails in questionnaires. Batten, Mellor and Wan (1993) achieved a response rate of only 18 per cent. Edelshain (1995) obtained a 20 per cent response. Of the 579 surveyed, 395 replies were received, a response rate of 68 per cent. However, the usable response rate was 51 per cent, since a number of the replies were incomplete. The responses were tested for non-response bias using a range of financial variables from the EXTEL database. This showed that the non-respondents had a somewhat lower proportion of domestic sales and a higher proportion of non-European Union sales. Whilst there is no evidence of any significant non-response bias, it is possible that the results may slightly underestimate the true extent to which British firms make use of strategic currency risk management techniques.

The questions on strategic risk management were similar but not identical to those asked by Cezairli (1988) and Edelshain (1995). Our survey built on their work and asked relatively specific questions in order to ensure a higher response rate. Table 1 gives summary results for the Cezairli and Edelshain studies. The broadly similar results for this study are given in Table 2. Note that the categorisation in our study is broadly consistent, but not identical to that of Table 1, but enough to allow comparisons to be made. In particular, our Table 2 categories for 'often' and 'occasionally' need to be aggregated in or-

der to determine the percentages of firms that make use of a particular technique as reported in the earlier studies.

Table 1: Previous Surveys of Operational Hedging Techniques

Strategic Technique	Cezairli (1988) US %	Edelshain (1995) UK %
Flexible sourcing	68	-
Product diversification	57	-
Geographical diversification	52	-
Matching costs and revenues	62	51
Foreign currency-denominated debt	60	50
Selective overseas plant location	-	10
Matching competitor sources	-	7
Acquisitions/disposals of businesses	-	6
Moving to weak currency input sources	-	6
Selecting assets in low correlation currencies	-	5
Productivity improvement programmes	-	4
Matching competitor markets	-	4
Moving to strong currency markets	-	3
Moving from strong currency input sources	-	3
Changing level/emphasis of promotion activity	-	2
Product differentiation programmes	-	1

Research Findings

The Use of Strategic Exposure Management Techniques

Respondents were asked to indicate the extent to which they used nine different strategic techniques as the primary means of managing exchange rate risk. Table 2 tabulates these responses and shows that only two techniques – using foreign currency-denominated debt, and matching costs with revenues denominated in the same currencies – are used by more than half of firms. These results are similar to those reported by Edelshain (1995) who found that about half of his sample used these two techniques.

A possible reason for the popularity of foreign currency-denominated debt is the flexibility that it provides. One advantage is that it is an add-on to the asset-liability management process. Firms can elect to raise such debt if it is advantageous. In addition, the creation of a financial liability within normal capital structure parameters only has a small impact on the firm's existing or future business operations. Given the existence of early call or redemption provisions on debt and the currency swaps market it is also relatively easy to modify the exposure at a later date. Furthermore, debt policy is usually the responsibility of the finance department

Table 2: Survey evidence on the use of operational hedging techniques

Strategy	Used 'Often' (per cent)	Used 'Occasionally' (per cent)	Used 'Never' (per cent)
1. Foreign currency-denominated debt	39	26	35
2. Sourcing inputs in the same currencies as sales are made	31	38	31
3. Differentiating the company's product/s to avoid direct price competition with foreign competitors	23	23	54
4. Locating production in the same countries as sales are made	22	17	61
5. Diversifying sales in many different currencies	19	18	63
6. Sourcing inputs in the same currencies as major competitors	15	21	64
7. Locating production / operations in the same country as major competitors	8	14	78
8. Altering the country from which inputs are sourced following movements in foreign exchange rates	4	35	61
9. Altering the country in which production occurs following movements in exchange rates	1	15	84
(Percentage responding: N = 289)			

which is likely to be most involved in currency risk management. Consequently, foreign currency denominated debt might be considered a hybrid strategy having features of both operational and financial hedging which would explain its popularity.

The most favoured operational strategies appear to be those designed to insulate the firm by matching the currency denomination of cash inflows and outflows. Operational matching reduces the size and hence impact of the currency mismatch.

Differentiating the firm's products and diversifying sales in many currencies are also used to reduce the sensitivity of sales volumes to price changes caused by exchange rate fluctuations. These results provide considerably more support for these strategies than those of Edelshain (1995). His results found only approximately 10 per cent of his sample located production in selling markets, compared to our 40 per cent. Furthermore, only one of the companies he surveyed employed product differentiation strategies compared to the 46 reported by our survey. To some extent these differences can be explained by the different questions being asked. Our results, however, lend strong support to the arguments relating exchange rate exposure to other strategic decisions within the firm. Sundaram and Mishra (1991) and Sundaram and Black (1992) make the case that a firm's exposure depends on the elasticity of customer demand which in turn depends on the degree of product differentiation. As a result, firms with more differentiated products are less subject to economic exposure.

Our results also indicate firms' awareness of their competitive position. Thirty-six per cent reported sourcing in the same currency as their main competitors, while 22 per cent reported locating production in the same countries as competitors. Whilst it is unlikely that competitors' actions will be the main determinant of firms' sourcing and location decisions, our findings indicate that a large minority are incorporating economic exposure into such operational decisions. The Flood and Lessard (1986) and Pringle and Connolly (1993) models explicitly adjust firms' exposure for common sourcing and selling currencies. By choosing to do so, firms are limiting the impact of exchange rate movements on their profit margins and sales volumes since all their competitors are affected in the same way.

The respondents appeared reluctant to alter production or sourcing locations in response to currency movements. However, approximately one third of respondents indicated that they occasionally alter the sources of their inputs. These results are similar to Edelshain (1995). This contrasts with the practices of many Japanese companies reported by Davidson (1996) that have managed their currency exposure to the yen by moving production offshore.

Although the questionnaire was directed at operational risk management strategies, 30 respondents took the opportunity to comment that they used forward foreign exchange contracts to manage transaction risk. While forwards may be useful in managing short-term transactional exposures, such financial hedges do not prevent the competitive position of the firm from being eroded (or strengthened) by currency movements in the long run.

A key element in managing long-run economic exposure is for firms to forecast their future foreign currency cash flows. Respondents were asked to indicate whether or not such future cash flow forecasts were made by their company and, if so, for which time horizon. Table 3 summarises these results.

Time Period	Percentage of Respondents
No forecast made	32
Up to 1 month	7
Up to 1 year	46
Greater than 1 year	16
(N = 289)	

Almost one third of respondents reported that they did not forecast their foreign currency cash flows. Of these companies, 74 per cent indicated in a later section of the questionnaire that foreign sales represented less than 20 per cent of total sales, while 80 per cent indicated that foreign-sourced inputs were less than 20 per cent of total inputs. While this explains a majority of the responses, it still leaves a sizeable number of companies with significant foreign purchases and sales (defined as 20 per cent or more of total inputs or sales) which did not forecast currency cash flows.

Almost half of the respondents indicated that they forecast future foreign currency cash flows for time periods out to one year. Such forecasts are useful in managing transaction and translation exposures. Garner and Shapiro (1984) and Shapiro (1992) point out that economic exposure is in effect the sensitivity of firm value to environmental factors. This requires an assessment period consistent with the firms' ability to make operational changes, which may take years. Only 16 per cent of respondents forecast their cash flows for periods in excess of a year. This suggests that the most sophisticated approaches, such as those described by Kohn (1990) and Lewent and Kerney (1990), are only used by a tiny minority of UK firms.

Constraints on the Use of Strategic Exposure Management Techniques

The results show that a substantial proportion of companies do not employ strategic techniques to manage their currency exposures. Holland (1992) and Dolde (1993) have pointed out the limitations placed upon the use of such techniques in many firms. Some companies such as Jaguar Cars, as Scott (1987) points out, are intrinsically barred from applying the techniques. Edelhain (1995) further suggests that a major factor for the lack of use of operational techniques is that currency exposure management has remained within the domain of the finance function. In his view, marketing, production and corporate planning divisions have little concern for foreign exchange risk management. In our survey, respondents were asked to indicate the extent to which foreign exchange risk management was incorporated into the decision-making processes of operating departments. The results are given in Table 4.

Table 4: The use of operating hedges and the consideration of currency risk management issues by operating departments

Incorporation of Currency Considerations	Number of Operational Hedging Techniques Used			
	0 %	1 - 3 %	4 - 6 %	7 - 9 %
All Companies	15	32	37	16
Always	5	33	46	16
Usually	1	27	44	28
Often	3	23	45	29
Occasionally	11	37	41	11
Never	50	36	10	4

(N = 289) $\chi^2 = 94.91$ (p = .0000)

Table 4 indicates a wide range of responses to the extent that currency risk considerations are made by departments other than the finance or treasury function. A large proportion (39 per cent) indicated that their firms always or usually take account of exchange rate effects when making decisions. These results are similar to those given by Broder (1984) who found that foreign exchange considerations played an important role in 40 per cent of the surveyed companies. However, a significant number (19 per cent) indicated that no such consideration was made. However, the vast majority of this group (90 per cent) indicated that they also considered their costs and revenues to be insensitive to exchange rate movements.

Edelshain (1995) puts forward the view that the low numbers of companies making use of strategic risk management techniques is due to exchange rate management being exclusively the domain of the finance function. In order to test this hypothesis, we examine whether the incorporation of exchange rate risk considerations in operational decision-making and the use of a particular strategic risk management technique are independent. A significant chi-square statistic would indicate that currency risk management considerations have an effect on whether a firm employs a strategic risk management technique. The results are given in Table 5.

Table 5: Results of the chi-square tests for the independence of the use of operational hedging techniques and the involvement of currency risk management considerations in operational decision-making	
Strategy	Chi-square statistic
1. Foreign currency-denominated debt	46.83*
2. Sourcing inputs in the same currencies as sales are made	30.43*
3. Differentiating the company's product/s to avoid direct price competition with foreign competitors	40.16*
4. Locating production in the same countries as sales are made	15.50*
5. Diversifying sales in many different currencies	34.60*
6. Sourcing inputs in the same currencies as major competitors	31.47*
7. Locating production / operations in the same country as major competitors	46.83*
8. Altering the country from which inputs are sourced following movements in foreign exchange rates	33.88*
9. Altering the country in which production occurs following movements in exchange rates	8.90
* significant at the .01 level	

Our analysis provides support for Edelshain's hypothesis and indicates that the use of operational hedging techniques is likely to be limited in those firms where foreign currency exposure is not considered by operational departments.

The results for altering the country in which production occurs following movements in exchange rates is inconclusive. For the majority of companies such a strategy may not be possible and this is partly borne out by the small number of companies (16 per cent) that reported using this technique.

Internationalisation and Strategic Management

Kogut (1983) proposed that firms can reduce their economic exposure through direct investment in foreign markets. In Table 6, we present the results for those firms without foreign subsidiaries and compare them to those that have diversified internationally. What is evident is that those firms which operate purely as domestic producers have less scope to use operational hedges. Our evidence suggests that owning foreign subsidiaries significantly increases the opportunities for firms to use operational techniques. Table 6 shows that foreign currency denominated debt is used by 84 per cent of foreign subsidiary

Table 6: The relationship between ownership of foreign subsidiaries and operational hedging techniques

Strategy	Percentage with foreign subsidiaries using strategy (N=202)	Percentage with no foreign subsidiaries using strategy (N=87)
1. Foreign currency-denominated debt	84	20
2. Sourcing inputs in the same currencies as sales are made	80	43
3. Differentiating the company's product/s to avoid direct price competition with foreign competitors	53	26
4. Locating production in the same countries as sales are made	50	11
5. Diversifying sales in many different currencies	46	13
6. Sourcing inputs in the same currencies as major competitors	42	21
7. Locating production / operations in the same country as major competitors	27	9
8. Altering the country from which inputs are sourced following movements in foreign exchange rates	43	31
9. Altering the country in which production occurs following movements in exchange rates	16	8
(N = 289)		

firms compared to just 20 per cent of firms operating solely domestically. Our results also show that matching strategies are used by 80 per cent of firms with foreign subsidiaries and that currency diversification is four times more likely. Miller and Reuer (1998) suggest that foreign subsidiaries may provide unique options, unavailable to purely domestic firms, for sourcing inputs, locating production, marketing, or other value chain activities. These results indicate that firms with foreign operations are more likely to be able to make use of a range of operational techniques to manage their strategic currency exposures.

Industry Effects

Respondents were grouped into five sector groups for utilities, services, consumer goods, industrials and extractive industries, as shown in Table 7. The table indicates that across our sector grouping there are significant differences as to the number of operational hedging techniques used. Our findings indicate that firms in the general industrials sector are most likely to use a large number of different techniques, averaging 4.9 methods. Only 8 per cent of industrials reported not using any operational techniques, whereas 40 per cent of the utilities sample did not make use of operational hedges. In addition, those utilities which applied such techniques only used a small number of methods. While these results may be affected by the relatively small sample sizes for the sectors, they are strongly suggestive that different industries have different scope for applying operational hedges. One explanation may be due to the lower level of economic exposure of the utility sector.

Table 7: The use of operating hedges across industries

Industry	No. of Respondents	Number of Techniques Used				Average
		0 %	1 - 3 %	4 - 6 %	7 - 9 %	
All Companies	296	14	32	38	16	3.8
Utilities	15	40	40	20	0	1.9
Services	113	18	42	34	6	2.8
Consumer Goods	35	14	23	49	14	4.0
Industrials	119	8	20	43	29	4.9
Extractive Industries	14	14	58	14	14	3.4

However, the service industries sector, a type of firm also considered relatively immune to currency risk, reported an average of 2.8 techniques and only 18 per cent reported not using any form of operational hedge. Utility companies tend to have little operating flexibility and this may explain the relative lack of operational hedging within this group. This also applies to extractive industries where the sourcing of inputs depends solely on the location of mineral deposits. For such companies adjusting sourcing policies is not an option in managing currency exposure. Furthermore they tend to operate in competitive international markets with low switching costs and minimal product differentiation.

Our sector results therefore indicate a strong industry effect. One possible explanation, already alluded to, is the relative operational flexibility for particular industries. The differences may also be explained in another way in that firms subject to extensive economic exposure have greater incentives to make use of operational hedging techniques. In Table 8 we report the results for the sensitivity ratings derived from the survey by sector for firms' sales volumes, profit margins, and input costs as well as the average number of techniques used. This indicates that industry sectors which have higher sensitivities are also more likely to make use of operational hedging techniques.

Conclusions

Our findings indicate that a significant proportion of UK firms are willing to make use of operational and strategic techniques to manage long-run exchange rate exposures. This proportion is higher for those firms that can take advantage of the opportunities offered by owning foreign subsidiaries. The use of operational hedging techniques is also likely to be higher, the greater the sensitivity to exchange rate movements of a firm's sales volumes, profit margins and input costs. The proportion of respondents reporting the use of marketing, production, and financing strategies to manage economic exposure is higher than that reported in prior surveys of UK and US firms.

Our findings demonstrate an initial preference for the hybrid financial/operating technique of foreign currency-denominated debt. One factor favouring this is that foreign exchange rate management is the domain of the financial function. However, we find evidence to support the view that firms' operating departments, such as marketing, production, and purchasing, do consider exchange rate effects in determining operational strategies. We also find evidence that the use of operational hedging techniques is related

Table 8: Exchange rate sensitivity ratings by sector

Sensitivity Ratings	N	1 Highly Insensitive %	2 %	3 %	4 %	5 Highly Sensitive %	Use of operational techniques (Average)
Sales Volumes							
All Companies		38	26	24	9	3	3.8
Utilities	15	73	20	7	-	-	1.9
Services	112	49	26	17	6	2	2.8
Consumer Goods	35	34	40	23	-	3	4.0
General Industrials	116	21	22	38	16	3	4.9
Mineral Extraction	14	57	29	-	7	7	3.4
Profit Margins							
All Companies		26	25	25	18	6	3.8
Utilities	15	60	26	7	7	-	1.9
Services	112	38	27	19	12	4	2.8
Consumer Goods	35	11	37	26	17	9	4.0
General Industrials	116	15	21	32	25	7	4.9
Mineral Extraction	14	7	14	43	14	22	3.4
Costs							
All Companies		31	24	27	13	5	3.8
Utilities	15	67	20	2	13	-	1.9
Services	112	48	22	17	10	3	2.8
Consumer Goods	35	20	11	31	29	9	4.0
General Industrials	116	14	29	39	13	5	4.9
Mineral Extraction	14	21	21	22	7	29	3.4

to the extent to which operating departments are involved in the foreign exchange risk management process. Our findings indicate that, for the larger UK plc which responded to our survey, the move towards a more integrated firmwide strategic risk management process is well under way.

The preferred hedging methods used by UK firms, suggest, however, that significant barriers do exist to a fully flexible operational approach. The advantages derived from pre-commitment and the economies of scale and scope in particular industries suggests only a few of the different methods can be applied (Holland, 1992; Dolde, 1993). Where firms exploit the value of brands or other intangible attributes based on location or country of origin, there is less scope for international diversification (Scott, 1987).

The models of economic exposure require firms to assess exposure over the medium term in order to measure its impact accurately. From the responses to our forecasting questions, it would appear that few firms, however, are attempting to quantify their exposure over the medium term.

Our findings also indicate potential areas for future research. Further studies examining the extent to which firms are able to integrate operational policies with strategic currency management would throw light on the opportunities and limitations of operational hedging techniques that are suggested by this and other research. In addition, specific studies looking across industries may help to explain the different adoption rates identified in this study. The survey results, together with comments provided by respondents and a small number of in-depth, follow-up interviews, suggest there is considerable inter- and intra-industry variation in practice which needs to be explained.

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