Foreign exchange risk management in UK, USA and Asia Pacific multinational companies

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Abstract

The objective of this paper is to simultaneously survey the foreign exchange risk practices of large UK, USA and Asia Pacific multinational companies (MNCs). It investigated whether foreign exchange risk management practices vary internationally, including for the first time a large sample Asia Pacific MNCs. From 179 (30%) usable responses it is shown that there are statistically significant regional differences in the importance and objectives of foreign exchange risk management, the emphasis on translation and economic exposures, the internal/external techniques used in managing foreign exchange risk and the policies in dealing with economic exposures. In general, UK and USA MNCs have similar policies, with a few notable exceptions, however, Asian Pacific MNCs display significant differences. To control for regional variations in the characteristics of respondents the results are also compared by size, percentage of overseas business and industry sector. It was found that either the size of the respondent or the industry sector could also explain the emphasis on translation and economic exposure and use of external hedging instruments. © 2000 Elsevier Science B.V. All rights reserved.

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1. Introduction

Although foreign exchange risk is one of the many business risks faced by multinational companies (MNCs) its management has become one of the key factors in overall financial management. Whether the objectives of MNCs are to minimise foreign exchange losses or maximise exchange gains, they need to understand the extent of exposure they face and manage it to an acceptable level. The contribution of this paper is to consider whether there are differences internationally in attitudes towards foreign exchange risk and the methods used to manage it.

There have been a number of prior UK and USA surveys on derivative use, several case studies on foreign exchange risk management policies in the UK and USA and one survey of derivative use in the Asia Pacific region (New Zealand)\(^1\). However, these previous studies are extended by considering only large MNCs\(^2\), focusing on a much wider question of foreign exchange risk than previously examined, considering the views of many of the countries in the Asia Pacific region which have never been examined before and finally, carrying out a simultaneous international comparison between regions using the same survey questionnaire\(^3\).

The results indicate that there are statistically significant regional differences in the objectives and importance of foreign exchange risk, the emphasis in the management of translation and economic exposures, internal/external techniques used in managing foreign exchange risk and the policies in dealing with economic exposure. On the whole, UK and USA MNCs have similar policies in general, with a few notable exceptions, but Asian Pacific MNCs display significant differences in their management of foreign exchange risk. To test whether these differences could also be caused by different company characteristics the responses were also analysed by size, percentage of overseas business and industry sector. Surprisingly, the percentage of overseas business had no statistically significant effect on any of the responses. The size of the respondents was statistically related to the view and management of translation exposure while the industry sector was significant in the

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\(^1\) Rodriguez (1981) and Davis et al. (1991) surveyed foreign exchange risk management in the US and UK MNCs, respectively. Collier and Davis (1985) and Belk and Glaum (1990) considered the management of currency risk by UK companies from interviews with 51 and 17 companies, respectively. In a later study Collier et al. (1992) examined case studies on foreign exchange management by 23 UK and US companies. US surveys of derivative use include Bodnar et al. (1995, 1996, 1998), Phillips (1995). Grant and Marshall (1997) provided a UK survey of derivative use and Berkman et al. (1997) surveyed 79 New Zealand companies and then compared their results to the Bodnar et al. (1996) US survey.

\(^2\) The previous evidence indicates large companies are exposed to foreign exchange risk to a greater extent than a cross section of companies and are also more likely to use hedging instruments. The survey sample had to meet two criteria; it had to be defined as a MNC (a corporation having at least one overseas subsidiary over which it has financial and management control) and it should not be a financial, banking, insurance and investment corporation.

\(^3\) The same questionnaire, written in English, was sent to all MNCs, however, for the Japanese MNCs it was translated. Confidentiality was guaranteed to respondents, however, a copy of the 600 MNCs surveyed and the questionnaire is available from the author on request.
importance of foreign exchange risk management, emphasis of economic exposure and the external hedging instruments used. Consequently, some of the regional differences could also be due to the company characteristics, however differences in the objectives of foreign exchange risk management, the internal techniques used in managing foreign exchange risk and the policies in dealing with economic exposures could only be explained by the region of the respondents.

The paper is organised as follows. Section 2 describes the research approach using a questionnaire survey. Section 3 describes the sample used in the survey. Section 4 presents the results of the survey and finally, concluding remarks appear in Section 5.

2. Questionnaire

In selecting the sample, since the author was interested in the attitude of corporations to foreign exchange risk, MNCs who would most likely be exposed to this risk were considered. From a review of the previous studies this suggested one concentrate on only the largest MNCs in each region. In July 1998 questionnaires were sent to the largest 200 UK, USA and Asia Pacific MNCs (20 Australia, 30 Hong Kong, 100 Japanese, 40 Singapore and ten South Korea). Responses were received between July and September 1998. The response rate of the survey and the breakdown of responses from the Asia Pacific region are shown in Table 1. The 30% overall response rate compares favourably with the previous single country studies in this area.

4 In general the responses of the Asia Pacific region were similar and the results were grouped together, nonetheless any significant differences found inter-region were highlighted.

5 For example, the response rate for the other major studies in this area are: 18.9% Phillips (1995), 36.4 and 22% Grant and Marshall (1997), 26.5% Bodnar et al. (1995), 16.2% Bodnar et al. (1996), 27.8% Jesswein et al. (1995) and 20.7% Bodnar et al. (1998). Although one was only targeting the largest 200 MNCs in each region a Kruskal Wallis test was applied to test for non-response bias between the respondents and non-respondents in each region. Using the information service, Datastream, eight financial variables (sales, profits, earnings per share, total loan capital, net profit margin, total assets, working capital ratio and borrowing ratio) were collected for the total samples for each from 1992 to 1997 (data on 11% of the sample was not available). Averages for each variable per year were compared for the response and non-response samples. No evidence was found of significant differences between the samples for six of the variables. For total assets and sales, there was a difference in a few regions (Australia, Hong Kong, UK only sales, and USA only total assets). The mean for the respondents in some years was larger than the mean for the non-respondents, indicating that the larger MNCs in these regions were more likely to respond. Since we were interested in the largest MNCs in each region this bias in respondents was not a significant problem. The industry sector of the response sample was also considered in comparison to the non-response sample for each region and found no significant differences in any of the regions. Nonetheless, the normal caveats apply when dealing with questionnaire survey data.
Table 1
Response to survey

<table>
<thead>
<tr>
<th>Regions</th>
<th>No. surveys sent</th>
<th>No. responses</th>
<th>No. usable responses</th>
<th>% of usable responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>UK</td>
<td>200</td>
<td>82</td>
<td>79</td>
<td>39.5</td>
</tr>
<tr>
<td>USA</td>
<td>200</td>
<td>49</td>
<td>47</td>
<td>23.8</td>
</tr>
<tr>
<td>Asia Pacific</td>
<td>200</td>
<td>54</td>
<td>53</td>
<td>26.5</td>
</tr>
<tr>
<td>Total</td>
<td>600</td>
<td>185</td>
<td>179</td>
<td>30.0</td>
</tr>
</tbody>
</table>

Table 2
Mean sales/total assets/profits of the multinational companies (MNCs) from each respondent region

<table>
<thead>
<tr>
<th>Sales</th>
<th>Total assets</th>
<th>Profit</th>
</tr>
</thead>
<tbody>
<tr>
<td>UK</td>
<td>3 528 798</td>
<td>1 344 467</td>
</tr>
<tr>
<td>USA</td>
<td>10 871 447</td>
<td>3 606 454</td>
</tr>
<tr>
<td>Asia Pacific</td>
<td>1 419 576</td>
<td>1 028 573</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Nos. (% of region)</th>
<th>Quartile 1 (largest sales)</th>
<th>Quartile 2</th>
<th>Quartile 3</th>
<th>Quartile 4 (smallest sales)</th>
</tr>
</thead>
<tbody>
<tr>
<td>UK</td>
<td>7 (9%)</td>
<td>17 (22%)</td>
<td>29 (37%)</td>
<td>25 (32%)</td>
</tr>
<tr>
<td>USA</td>
<td>24 (53%)</td>
<td>17 (38%)</td>
<td>3 (7%)</td>
<td>1 (2%)</td>
</tr>
<tr>
<td>Asia Pacific</td>
<td>13 (27%)</td>
<td>6 (13%)</td>
<td>13 (27%)</td>
<td>16 (33%)</td>
</tr>
</tbody>
</table>

* Information for Datastream/Extel Company Research, all values in £000s. Mean values of sales, total assets and profits were obtained from the 1998 financial statements. Based on the mean sales MNCs were ranked and the sample was split into size quartiles. Not all information on sales from the responding MNCs was available (numbers unavailable were 1, 2, and 5 for the UK, USA and Asia Pacific MNCs, respectively).

3. Sample

The primary focus of this study was to consider differences in the attitudes to foreign exchange risk management between regions. One of the problems in using the different regions is that the largest MNCs in each region could differ in terms of their size, industry and degree of internationalisation. Variations in the regional responses could simply be due to different company characteristics. This problem is controlled for by not only considering the responses in terms of their region but also in size (analysed by quartiles determined by sales), degree of internationalisation (four groups measured by the percentage of overseas business) and the industry sector (categorised in seven industry groups). To test for statistical differences between the responses and respondents from different regions, the size of the MNCs, the degree of internationalisation and the industry sector, chi-square ($\chi^2$)
Table 3
Percentage of overseas business to total revenues<sup>a</sup>

<table>
<thead>
<tr>
<th>No. (% of region) of MNCs in each percentage group</th>
<th>1–25%</th>
<th>26–50%</th>
<th>51–75%</th>
<th>76–100%</th>
</tr>
</thead>
<tbody>
<tr>
<td>UK</td>
<td>26 (33%)</td>
<td>11 (14%)</td>
<td>25 (32%)</td>
<td>17 (21%)</td>
</tr>
<tr>
<td>USA</td>
<td>22 (47%)</td>
<td>18 (38%)</td>
<td>7 (15%)</td>
<td>0</td>
</tr>
<tr>
<td>Asia Pacific</td>
<td>18 (34%)</td>
<td>19 (36%)</td>
<td>9 (17%)</td>
<td>7 (13%)</td>
</tr>
<tr>
<td>Total</td>
<td>66 (38%)</td>
<td>48 (27%)</td>
<td>41 (23%)</td>
<td>24 (12%)</td>
</tr>
</tbody>
</table>

<sup>a</sup> Information given by respondents in the questionnaire.

Tests were used<sup>6</sup>. Figures of the regional breakdown of responses are presented, however, the Appendix provides the detailed results of the χ<sup>2</sup> tests of the responses compared to region, size, degree of internationalisation and industry sector.

Table 2 presents information on the average size of the respondents in the three regions, using sales, total assets and profit. Also, the number of MNCs from each region in the size quartiles as measured by sales are presented, which were used to examine the responses. There is a significant difference in the size of the responding MNCs from each region (χ<sup>2</sup> (6) = 50.91015; P-value = 0.000). Unsurprisingly, the USA respondents are the largest. This is inevitable given the aim of the survey was to survey the 200 largest in each region and the overall size of USA MNCs. The UK MNCs are on average larger than the Asian Pacific MNCs, however, there is a larger percentage of Asian Pacific MNCs in the highest size quartile, primarily Japanese MNCs. There is therefore a large variation in the size of the Asian Pacific MNCs, which reflects some of the different regions involved.

Table 3 indicates that the majority of respondents (65%) rely on their home markets for over 50% of their sales. However, there is a significant difference in the responding region and the percentage of overseas business (χ<sup>2</sup> (6) = 24.98983; P-value = 0.001). Despite the growing presence of US MNCs in the world market, their revenues from overseas business remain low compared with the revenues from home markets, only 17% of US MNCs have more than 50% of revenue from overseas. Given their large single currency home markets, this was not surprising. UK MNCs appear to be the most reliant on overseas trade with about half having more than 50% of their revenues from overseas. The significance of overseas business for UK MNCs is driven by the relatively smaller size of the home markets and investments the UK MNCs have in the Commonwealth, Western Europe and North America. The relatively short history of many Asian Pacific MNCs, starting in the 1960s and 1970s, could account for only 30% of Asian Pacific MNCs having more than 50% of their sales from overseas.

Formal hypothesis are not set out, the null hypothesis is no association between the responses and the regions, size, degree of internationalisation and industry sector. Throughout the paper the null hypothesis of no association is rejected for probability P-values less than or equal to 10%. The degrees of freedom following the χ<sup>2</sup> statistic are in parenthesis.
Table 4
Industry classification of the respondent multinational companies (MNCs)\textsuperscript{a}

<table>
<thead>
<tr>
<th>No. MNCs in each industry sector</th>
<th>Transport/utility</th>
<th>Services</th>
<th>Industrial</th>
<th>Manufacturing</th>
<th>Property</th>
<th>Retail/wholesale</th>
<th>Other/consolidated</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>UK</td>
<td>11</td>
<td>11</td>
<td>15</td>
<td>23</td>
<td>5</td>
<td>13</td>
<td>1</td>
<td>79</td>
</tr>
<tr>
<td>USA</td>
<td>7</td>
<td>3</td>
<td>8</td>
<td>20</td>
<td>0</td>
<td>8</td>
<td>1</td>
<td>47</td>
</tr>
<tr>
<td>Asia Pacific</td>
<td>5</td>
<td>4</td>
<td>15</td>
<td>16</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>52</td>
</tr>
<tr>
<td>Total</td>
<td>23</td>
<td>18</td>
<td>38</td>
<td>59</td>
<td>8</td>
<td>25</td>
<td>7</td>
<td>178</td>
</tr>
</tbody>
</table>

\textsuperscript{a} Industries allocated according to Extel Financial Company Research industry classifications, one Asian MNCs classification was not available.
Fig. 1. A comparison of the importance of foreign exchange risk management to business risk management.

Table 4 indicates that the majority of respondents are part of the industrial/manufacturing industry grouping. Notable differences between the regions were the relatively high numbers of service and retail/wholesale MNCs in the UK, however, there was no statistically significant industry difference. Consequently, differences between the regional responses may be driven by the size of the respondents and the percentage of overseas business. This is controlled for by considering the responses not only by regional grouping but also by their size and their degree of internationalisation. Although there is no significant difference in the regional industry breakdown it is also considered if there is an industry effect in the responses.

4. Analysis of results

4.1. Importance of foreign exchange risk management

It has been noted that financial risk management is one of the most significant financial activities of MNCs (Rawls and Smithson, 1990). Fig. 1 shows the importance of foreign exchange risk management in relation to business risk management for each region. The majority of the respondents stated that foreign exchange risk management is equally or significantly important in relation to business risk management, however, Fig. 1 shows a significant difference between
the regions ($\chi^2 (8) = 16.791$; $P$-value $= 0.05$). There was no statistically significant difference between UK and USA MNCs but there was a significant difference with both regions and Asia Pacific MNCs when considered on a paired basis. In Asia Pacific, a total of 87% of respondent companies rank foreign exchange risk management as equally or significantly important. The Asian crisis, which caused Asian currencies to depreciate by as much as 70% clearly influences this result. For example, one South Korean respondent said: “until last year, foreign exchange risk was a minor concern for most South Korea companies. However, foreign exchange risk management will be one of the most important factors in corporate management in the years to come”.

A high proportion of UK respondents ranked foreign exchange risk management as significantly important or most important, which is expected as the UK MNCs rely on a high degree of overseas business. One UK respondent explained that foreign exchange risk “impacts directly on the creation of shareholder value and competitive position”. However, this view does not seem to be shared in the USA as 45% of USA respondents’ report that foreign exchange risk management is marginally important or least important. One USA respondent explained that “foreign exchange risk management is another attribute of doing business on a global basis. It is one of the many items that are necessary to do business…but is no more a burden than another items”. The Appendix demonstrates a significant difference between the industry sector and the importance of foreign exchange risk ($\chi^2 (24) = 36.447$; $P$-value $= 0.05$). This difference was driven by the lower importance of foreign exchange risk in the service industry sector, which may indicate a higher reliance on domestic business and less exposure to overseas competitors in this sector.

### 4.2. Objectives of managing foreign exchange risk

The result of the previous section demonstrated that in general foreign exchange risk management is an important activity for many of the MNCs surveyed. However, there are a number of approaches in dealing with this risk. It has been reported that the overall objective in foreign exchange risk management of many corporations is defensive in an attempt to minimise foreign exchange losses (Tran, 1980; Rodriguez, 1981). Other stated objectives of managing foreign exchange risk include; reducing the volatility of cash flows (Copeland and Joshi, 1996; Cummins et al., 1998), hedge the risk irrespective of the views on foreign exchange risk (Dolde, 1993) and protecting earnings fluctuations (Tran, 1980).

It can be seen from Fig. 2 there was a significant difference between the objective of managing foreign exchange risk management and the respondent region ($\chi^2$...
Again, this difference is driven by the Asian Pacific MNCs as the responses for the UK and USA MNCs are very similar with 85% of UK and USA respondents seeking to achieve certainty of cashflow and to minimise the fluctuations of earnings. This finding for the UK and USA MNCs is consistent with previous single country studies in these regions (see Bodnar et al., 1995; Grant and Marshall, 1997) and the arguments of Copeland and Joshi (1996) and Cummins et al. (1998). Although not significant, MNCs in the largest size quartile were particularly concerned with minimising the fluctuations in earnings, while those MNCs with the highest degree on internationalisation had the primary objective of achieving certainty of cashflows. In contrast, the main objective of 60% of Asia Pacific MNCs is to minimise fluctuations of earnings (in particular in Japan, where 75% of respondents favoured this objective), while only 25% seek certainty of cashflows. For many of the Asian Pacific MNCs maintaining a steady and certain stream of cashflows has a lower priority than maintaining earnings. The difference between the regions could not be explained by any of the company characteristics, as the Appendix shows no other statistically significant relationships.

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Fig. 2. Objectives of managing foreign exchange risk.

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The relevant test statistics for the paired association between the respondent region and the objectives in foreign exchange risk management are for UK versus Asia Pacific $\chi^2 (3) = 10.745$ ($P$-value = 0.01) and USA versus Asia Pacific $\chi^2 (3) = 7.918$ ($P$-value = 0.02).
4.3. Types of foreign exchange risk

There are commonly three different types of foreign exchange risk exposures discussed in the literature, namely translation, transaction and economic exposures. There is no agreement as to which of these exposures is the most important or which exposure needs to be emphasised for management. There is also confusion due to the overlapping and imprecise nature of these terms. Empirical studies in the UK and USA suggest that most companies tend to manage transaction exposure more than the other two exposures. Belk and Edelshain (1997), Duangploy et al. (1997) and Khoury and Chan (1988) in their research on USA MNCs found that majority of respondents indicated that their day-to-day management of transaction exposure was the centrepiece of their foreign exchange risk management.

Whether translation should be actively managed has been widely debated. Many textbooks (see Shapiro, 1998 amongst others) present the view that translation exposure should not be managed as it is purely an accounting concept not related to cash flows. However, Rodriguez (1977) and Collier et al. (1992) confirm that USA and UK companies do manage translation exposure. The decision on the hedging translation exposure is influenced by the financial reporting requirements at play in the reporting country (see Hakkarainen et al., 1998 for a discussion).

Glaum (1990) and Kohn (1990) emphasise that economic exposure management is the most important concept in foreign exchange management. However, although many companies seem to recognise the importance of economic exposures they have not systematically managed them. Blin et al. (1980) observe that fewer than a third of companies in their survey indicated that some internal adjustments for economic exposure were undertaken. This research seeks to establish the emphasis placed by MNCs in different regions on each of these risks and whether there is a regional variation.

4.3.1. Transaction risk

As shown in Fig. 3, the majority of the respondents in each region placed transaction exposure as highly important, particularly in the USA, where 59% of the respondents placed the most emphasis on transaction risk. The Appendix shows there was no significant difference between the regions, size, degree of internationalisation or industry sector with over 80% rating the importance as 4 or 5 (the mean response was 4.21, 4.37 and 4.17 for the UK, USA and Asia Pacific MNCs, respectively). The emphasis placed on transaction risk is understandable in view of immediacy of impact of transaction risk on the cashflows and profitability. The high emphasis is consistent with all the previous single country evidence.

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9 It is important to appreciate that translation, transaction and economic exposures are not discrete exposures but overlapping and interrelated parts of foreign currency exposure. MNCs are not exposed only to just one type of exposure in isolation. This research does not attempt to establish any interrelationship between the different types of foreign exposures. Rather it attempts to establish the emphasis placed by MNCs in managing each type of the exposure.

10 All Korean MNC ranked transaction exposure as most important and 62% of Japanese respondents, while only 35% of Australian MNC shared this view.
4.3.2. Translation risk

Fig. 4 illustrates a significant difference between the respondent region and their emphasis on translation exposure, ($\chi^2 (8) = 25.43389; P\text{-value} = 0.01$). When considered on a paired basis, there was a significant difference between the USA MNCs and the other two regions\textsuperscript{11}. USA respondents placed least emphasis on translation risk (63% MNCs rating it 1 or 2), with a mean response of 2.34 compared with a UK mean of 3.02 and an Asia Pacific mean of 3.45. This could be explained by the lower percentage of overseas revenue of USA MNCs than the other two regions. For the UK and Asia Pacific MNCs the higher emphasis could be explained by their comparatively higher proportion of overseas business which results in higher translation gains or losses if there are movements in foreign currencies. This seems to be particularly true for the Asia Pacific MNCs, with 48% rating it 4 or 5. Singaporean MNCs were especially prominent in rating translation exposure highly. The other important influence will be the individual accounting requirements in each region as the distinct requirements could influence the impact of translation exposure on the financial statements. Finally, the relative strength of the reporting currency will be an important consideration as this will impact of the

\textsuperscript{11} The relevant test statistics for the paired association between the respondent region and the importance of translation exposure are for UK versus USA $\chi^2 (4) = 10.726 (P\text{-value} = 0.05)$ and USA versus Asia Pacific $\chi^2 (5) = 25.693 (P\text{-value} = 0.00)$. 
value of assets and liabilities held abroad. The weakening Asian currencies in the survey period could therefore explain the importance the Asian Pacific MNCs attribute to translation exposure. It is also noted, from the Appendix, that the largest size quartiles (containing many of the USA MNCs) also placed a significantly lower emphasis on translation exposure and there was a significant relationship between the size of respondents and the emphasis on translation exposure ($\chi^2 (12) = 21.7497; P$-value = 0.05). Unsurprisingly, given the nature of their investments, property MNCs also rated translation exposure highly, although the industry sector was not a significant determinant of the responses.

4.3.3. Economic risk

Managing economic risk poses a serious challenge for MNCs, particularly as the impact of exchange rate fluctuations on net cash flows extends well beyond the accounting period in which these fluctuations occur. Although economic exposure is considered important, failure to quantify its exposure, results in lesser attention than the other forms of exposure. It can be seen from Fig. 5 that respondents placed a mixed emphasis on the economic risk. This could be expected because of the overlapping definitions of economic exposure and the difficulty in quantifying

![Fig. 4. Emphasis on translation risk. 1, least important; 5, most important.](image)
its impact. Fig. 5 indicates a significant difference between the regions ($\chi^2 (8) = 17.327$; $P$-value $= 0.05$), mainly caused by the difference between Asia Pacific MNCs and the other two regions (mean response by Asia Pacific MNCs was 3.64 in comparison to 3.02 and 3.29 for UK and USA MNCs, respectively)$^{12}$. A large number (33%) of Asia Pacific respondents place the highest emphasis on economic exposure with over 50% rating as 4 or 5 and no respondent rating it as 1. This could be influenced heavily by the recent Asian currency crisis. It would appear that competitive advantage sought by the Asian Pacific MNCs has been eroded by the Asia currency crises beyond realm of translation and transaction exposure management. To overcome the currency turmoil, Asia Pacific MNCs may have to address their long-term economic exposure and competitiveness. It was also found that MNCs in the small size quartile rated economic exposure as most important which is consistent with the high number of Asian Pacific MNCs in this grouping. Unsurprisingly, those MNCs with the highest degree of internationalisation also

$^{12}$The relevant test statistics for the paired association between the respondent region and the importance of economic exposure are for UK versus Asia Pacific $\chi^2 (4) = 12.225$ ($P$-value $= 0.02$) and USA versus Asia Pacific $\chi^2 (4) = 10.092$ ($P$-value $= 0.05$).
rated the management of economic exposure as important. However, the Appendix shows that these differences were not significant. There was a significant difference ($\chi^2 (24) = 36.38224; P$-value = 0.1) in the views of the different industry sectors with the service sector rating this as a low priority due to the low exposure to overseas business and the other/consolidated grouping viewing managing economic exposure as important, probably due to the diverse nature of their operations.

4.4. Management of foreign exchange risk

Foreign exchange management is aimed at protecting a company against adverse effects of exchange rate fluctuations. The general lack of a comprehensive framework (see Froot et al., 1994) for managing and hedging currency exposures would imply that companies would adopt a variety of methods. The literature identifies as number of approaches (see Hakkarainen et al., 1998) and there is a wide range of methods to manage foreign exchange risk. These methods are generally categorised into internal and external methods. Internal methods are a part of a firm’s organisational financial management and do not resort to special contractual relationships outside the group of companies concerned while external methods use contractual means to insure against potential foreign exchange losses. The main internal methods for managing foreign currency exposures in terms of short term cash flows are matching, leading and lagging, netting, balance sheet hedging and pricing policies. For longer-term cash flows, the main way is through international diversification in manufacturing, distribution, and financing decisions. External methods considered in the survey are forward contracts and derivatives such as currency futures, options on currency futures, currency options and currency swaps.

Table 5 considers whether the respondents manage translation and transaction exposure and whether they use internal or external methods. The vast majority of

<table>
<thead>
<tr>
<th>Table 5</th>
<th>Internal and external management of foreign exchange risk by region</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>USA No. (%)</td>
</tr>
<tr>
<td>Internal methods used to manage transaction exposure</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>42 (89)</td>
</tr>
<tr>
<td>No</td>
<td>5 (11)</td>
</tr>
<tr>
<td>External methods used to manage transaction exposure</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>46 (98)</td>
</tr>
<tr>
<td>No</td>
<td>1 (2)</td>
</tr>
<tr>
<td>Internal methods used to manage translation exposure</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>27 (57)</td>
</tr>
<tr>
<td>No</td>
<td>20 (43)</td>
</tr>
<tr>
<td>External methods used to manage translation exposure</td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>21 (45)</td>
</tr>
<tr>
<td>No</td>
<td>26 (55)</td>
</tr>
</tbody>
</table>
Fig. 6. Internal methods used for managing transaction risk. Respondents could choose more than one method.

Respondents’ use hedging instruments, only seven MNCs do not use internal hedging instruments and five do not use external hedging instruments\(^\text{13}\). In general, consistent with Fig. 5, translation exposure seems least important with the USA MNCs in comparison to Asia Pacific and the UK MNCs, with only around 50\% of USA MNCs managing this exposure using internal and/or external methods. In the UK and Asia Pacific most MNCs manage translation exposure, however in Asia Pacific they primarily use internal methods, while in the UK internal and external methods are both important. For transaction exposure the results for the three geographical regions are very similar with most MNCs managing this exposure using a mixture of internal and external methods. As expected with the choice of large MNCs for this survey, the vast majority of MNCs externally manage transaction risk, indicating the widespread use and acceptance of forward contracts and some of the derivative instruments\(^\text{14}\). The use of internal and external hedging instruments was also considered when the respondents were categorised by size,

\(^{13}\) Most respondents were using both internal and external hedging instruments. This is consistent with Hakkarainen et al. (1998) who found that most Finnish companies manage transaction and translation by initially by employing internal instruments and for the remaining exposures that cannot be hedged that way external instruments are used. The extremely high usage of external instruments (97\%) is contrast to the much lower percentages in previous studies (see Bodnar et al., 1998 for a summary of their previous surveys where the average derivative use is around 40\%) and supports the decision to survey only the largest companies in each region.

\(^{14}\) This is in contrast with the results of Bodnar et al. (1995) and the other surveys who consider a wider range of corporations.
degree of internationalisation and industry sector\(^{15}\). The low emphasis on translation exposure by US MNCs is also reflected in the size quartiles, as the highest percentage who do not manage translation exposure using internal or external methods are in the largest size quartiles. There are no notable differences when the responses are considered by the degree of internationalisation and the industry sector.

4.4.1. Management of transaction risk

4.4.1.1. Internal methods. Fig. 6 shows no significant difference between the regions in the internal methods to manage transaction exposure. Similarly, the Appendix also shows there was no statistically significant difference in any of the company characteristic variables. Broadly, netting seems to be the most popular technique amid the UK and USA respondents, although matching and pricing policies are also fashionable and many MNCs were using at least two of these methods. This is understandable given the similarities in the process of implementing internal methods. The prevalence of the netting technique could be due to the ease of establishing an intra-group settlement program and potential substantial savings in bank charges and communication expenses. Matching is the next most popular method among the UK and USA MNCs. There is no one particular method that is dominant among Asia Pacific MNCs. Netting and matching are used evenly among the Asia Pacific respondents, although netting is unpopular in Hong Kong. Pricing policies are frequently used by the respondents and the use of these policies seems to be common practice in Australia. They are also commonly used in the transport/utility industry grouping which due to the relationships with suppliers and customers in these industries may be more suited to the use of this type of policy. There was also a noted preference for pricing policies amongst the MNCs with the highest degree of international operations due to their high volume of transactions and experience of international trade. Leading and lagging is not as widespread as the major international textbooks would predict (see Shapiro, 1998), although any popularity seems to be with the smaller MNCs in the sample\(^{16}\). As expected, balance sheet hedging methods are not commonly used for internally hedging transaction risk. As will be seen this is in contrast to the results for the internal methods for hedging translation risk.

4.4.1.2. External methods. It can be seen from Fig. 7 that the forward contract is the most popular method in managing the transaction risk with nearly all the MNCs using forwards. Many of the MNCs were only using forwards, the average number of methods used for all the MNCs was less than two of the methods listed.

\(^{15}\) This information is available from the author on request.

\(^{16}\) Rodriguez (1981) found in a survey of US companies that leading and lagging was the most preferred method and this sample included smaller companies than the present study. There is some recent anecdotal evidence that a number of Asian companies faced with the currency crisis employed leading techniques. Consequently, the preference for some of these methods may change over time and as economic conditions change.
However, Fig. 7 shows there is a significant difference between the regions ($\chi^2(10) = 16.556; P$-value = 0.1), this was driven by differences between UK and Asian Pacific MNCs. Derivatives are not as commonly used as forward contracts, however, currency swaps, currency options are used by approximately 50% of respondents, especially currency options in Asia Pacific. This percentage of derivative use is high in comparison to previous single country surveys indicating the comparatively sophisticated risk management practices of the MNCs surveyed in the paper. Despite the size of the UK and USA derivative exchanges, with the largest selection of exchange-traded currency products and many theoretical advantages, currency futures and options on currency futures are the least adopted derivatives among the UK and USA MNCs. Surprisingly, the usage of these

Fig. 7. External methods used for managing transaction risk. Respondents could choose more than one method.

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17 The relevant test statistics for the paired association between the respondent region and the external methods used to manage transaction exposure for UK versus Asia Pacific is $\chi^2(5) = 10.207 (P$-value = 0.1).

18 Currency options were very popular in Australia and Japan. Asian Pacific MNCs were also more likely to use a larger number of methods as on average they used 2.5 of the methods listed while UK and USA MNCs used 1.97 and 2.01 of the methods, respectively.

19 The use of currency swaps and currency options as a percentage of derivative users from prior surveys of US and Asia Pacific (New Zealand) was 15 and 14% (Phillips, 1995), and 31 and 34% (Berkman et al., 1997), respectively. The UK survey does not present results on currency swaps.
derivatives is higher in Asia Pacific, especially in Japan and Singapore. The exchanges here have seemingly had more success in convincing the MNCs in these regions of their advantages. The Appendix shows there was a significant difference between the industry sector and external methods used to manage transaction exposure \( \chi^2 (30) = 71.2741; \ P\text{-value} = 0.00 \). This was principally caused by the high usage in the transport/utility sector of the exchange-traded derivatives. This could be explained by the experience these MNCs may have in using commodity derivatives, which are commonly used in these sectors, which then enables them to have the confidence to use currency futures and options on currency futures in managing currency risk.

4.4.2. Management of translation risk

4.4.2.1. Internal methods. Fig. 8 shows that for those MNCs who manage translation risk balance sheet hedging is the most common method. Many of the MNCs were only using this method\(^{20}\). However, it was less popular in Asia Pacific than the other two regions. This is understandable given the link between the Asian Pacific MNCs and the smallest size quartile and their lack of investments overseas. The

\(^{20}\) The average number of methods used by all the MNCs was 1.67, which was similar for all regions.
usage of other methods varies among the three regions and Fig. 8 shows there was a significant difference between the regions \( (\chi^2 (10) = 23.028; P\text{-value} = 0.02) \), driven primarily by differences between the UK MNCs policies and the other regions\(^{21}\). Netting and matching are the next most preferred methods. Table 5 demonstrated that UK MNCs and Asian Pacific MNCs are the most active in hedging this risk but the Asian Pacific MNCs seem to employ a large number of different techniques while UK MNCs restrict themselves to one of the most popular methods. Pricing policies and leading and lagging are not used very often, especially in UK. The wide use of balance sheet hedging, netting and matching techniques indicated that the MNCs surveyed are more concerned with their net asset translation risk exposure than earnings exposure. The Appendix shows no significant relationship between the management of translation exposure and the MNCs company characteristics and accordingly, there is only a regional factor in the use of internal methods for managing translation exposure.

### 4.4.2.2. External methods

Table 5 demonstrated that over half the MNCs in the USA and Asia Pacific did not manage translation exposure using external methods. However, those that do, primarily use forward contracts, options and swaps (in Asia Pacific), to a lesser extent currency futures are used. Typically, the MNCs who manage this risk with external methods, would use on average two of these methods. For example, the 75% of UK MNCs who manage this risk rely heavily on currency swaps followed by forwards. Consistent with the characteristics of the UK MNCs, swaps are also popular in the industrial/manufacturing sectors and with MNCs with a high percentage of international business. The high use of swaps can also be explained with the emphasis on the internal method of balance sheet hedging and may actually be seen as a more convenient way to hedge, without borrowing in overseas markets. Consequently, Fig. 9 shows a statistically significant difference between the regions \( (\chi^2 (10) = 30.854; P\text{-value} = 0.000) \) and the use of external methods for managing translation exposure, especially between UK MNCs and the other two regions\(^{22}\). It is worth noting, despite the small numbers of Asia Pacific and USA MNCs who manage this exposure, they do so in a comparatively sophisticated manner as currency options are popular with about half of the respondents in Asia Pacific and the USA. Currency futures are not popular in the UK and USA, but one in five Asia Pacific MNCs use these derivatives. The Asian Pacific MNCs seem to be the more sophisticated derivative users and have moved on from the simple forward contract. Currency options are also popular in the smaller size quartiles (which may be the influence of the Asian Pacific MNCs) and

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\(^{21}\) The relevant test statistics for the paired association between the respondent region and the internal methods used to manage translation exposure are for UK versus USA \( \chi^2 (5) = 20.743 \) \((P\text{-value} = 0.00)\) and UK versus Asia Pacific \( \chi^2 (5) = 11.689 \) \((P\text{-value} = 0.01)\).

\(^{22}\) The relevant test statistics for the paired association between the respondent region and the external methods used to manage translation exposure are for UK versus USA \( \chi^2 (5) = 22.011 \) \((P\text{-value} = 0.00)\) and UK versus Asia Pacific \( \chi^2 (5) = 24.638 \) \((P\text{-value} = 0.00)\).
consequently, the Appendix shows a significant difference between the size proxy and external methods used to manage translation exposure ($\chi^2 (15) = 28.34517$; $P$-value = 0.02). They was also a significant difference, from the Appendix, in the use of external instruments for managing translation exposure when the industry sector was analysed ($\chi^2 (30) = 60.35102$; $P$-value = 0.00). The consolidated/other industry sector were comparatively high users of exchange trade derivatives while the industrial and transport/utility sectors were high users of swaps in comparison to the other sectors. This may be reflective of the fact that because of the nature of these industry sectors they may be more experienced users of derivatives and also the nature of their overseas investments.

4.4.3. Management of economic risk

Although there is no practical derivative for managing economic risk (Duangploy et al., 1997), there are a wide range of internal methods available. The literature perceives economic exposure management as a dynamic concept that should be incorporated into the long range, strategic planning system of the corporation (Glaum, 1990). Fig. 10 confirms MNCs use a number of different methods for

![Diagram of external methods used by multinational companies (MNCs) who manage translation risk. Respondents could choose more than one method.](image)
managing the economic exposure, however there was a significant difference between the regions ($\chi^2(10) = 24.632; P\text{-value} = 0.01$), with UK MNCs being notable for their difference with the other regions$^{23}$. Although there are a number of popular methods, pricing strategy is the favourite choice. The widespread use of pricing strategy implies that MNCs are faced with a relatively high degree of price elasticity of demand, that is, highly competitive markets. Thus, MNCs are willing to sacrifice profit margins than sales volume when the home currency appreciates. The use of productivity raising strategies by Asian Pacific respondents is higher than their counterparts in UK and USA and second only to pricing strategies. This is consistent with the characteristics of Asia Pacific MNCs, which may view flexible technology, skilled and low cost management and low overheads as their primary strengths and sources of competitive advantages. The use of a planning strategy by the respondents in UK is low in comparison to Asia Pacific and USA, for example, one UK respondent said that rather than having a long-term plan their strategy varied from case to case.

$^{23}$The relevant test statistics for the paired association between the respondent region and the methods used to manage economic exposure are for UK versus USA $\chi^2(5) = 11.901$ ($P\text{-value} = 0.05$) and UK versus Asia Pacific $\chi^2(5) = 17.931$ ($P\text{-value} = 0.01$).
The nature and extent of economic exposures vary from one MNCs to another. As a result, it is not surprising that MNCs adopted different approaches. As one UK respondent put it: “the uncertainty of economic exposure is too great, e.g. locating in a country whose currency has devalued — within a few years the currency may be revalued”. As part of the ‘others’ category, although academically unpopular, diversification was suggested as a possible solution to reducing economic risk by a few of the MNCs. For example, one USA respondent said that diversification is the key to spreading economic risk. It seems the difference in views on methods to manage economic exposure is a regional as there are no notable differences in the other company characteristics of the MNCs examined and the methods used in managing economic exposure, see the Appendix.

Although theoretically economic exposure is a very significant form of risk, quite a number of MNCs surveyed do not actively manage economic risk. Some of the company characteristics were an important influence in this decision. For instance, economic exposure was not actively managed in the service industry sector, however the vast majority of internationalised MNCs, as measured by their degree of international business, did manage this exposure. Fig. 11 illustrates that there are 43% of respondents in UK, 26% in USA and 21% in Asia Pacific do not manage the economic exposure.

The results establish the primary reasons for not managing economic risk are that there are no effective tools and that the costs of managing it outweigh the benefits. This could be due to the lack of understanding of economic risk because

![Fig. 11. Reasons for not managing economic risk.](image)

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24 The small numbers in this section precluded any statistical analysis.
of the overlapping definitions (Lessard, 1990) and the difficulty in quantifying its impact. Economic management strategy depends on the nature of the firm and the exposure to exchange rate. Thus, it is not surprising to find that some companies do not manage this exposure at all and consider that it has no significant impact. This seems especially true in the responses by the UK MNCs. It is not certain whether companies have underestimated its impact, which is difficult to quantify, or there is lack of effective tools to deal with the complexity of the exposure. According to some, especially in the UK, the cost of managing this exposure may also outweigh the benefit.

5. Conclusion

In this paper the author has attempted to investigate the foreign exchange risk practices of multinational companies (MNCs). The primary contribution was to identify any international differences in approach to risk management between UK, USA and Asia Pacific MNCs. A number of similarities were identified, however, there were some notable variations between the USA and UK and in particular, respondents from Asia Pacific MNCs. There was a difference between the regions in their views on the importance and objectives of foreign exchange risk, emphasis on translation and economic exposure, the use of internal/external hedging instruments and policies in managing economic exposure. The responses by different company characteristics were also considered, including size, percentage of overseas business and industry sector. The percentage of overseas business was not a significant factor however, either the size or the industry sector of the MNCs were statistically significant in the importance exchange rate risk, emphasis on economic and translation exposure and external methods used in hedging. Consequently, the regional factor was the only statistically significant influence in the difference in responses on the objectives of managing foreign exchange risk, the internal hedging methods used and the policies in managing economic exposure.

The main objectives of managing foreign exchange risk are found to be minimisation of fluctuation in earnings and seeking certainty of cashflows, although a higher proportion of Asia Pacific MNCs main objective is to minimise fluctuations in earnings. It was established that the majority of the Asia Pacific MNCs ranked foreign exchange risk management as equally or significantly important in relation to their business risk management whilst the UK and USA MNCs ranked foreign exchange risk management as equally important as business risk management and one third of USA MNCs rated it only as marginally important, which could be explained by their smaller proportion of overseas business. The Asia Pacific MNCs emphasis on the importance of foreign exchange risk management and economic exposure could be influenced by Asian economic crisis. The industry sector had also a significant impact on the views on the importance of foreign exchange risk. The service industry did not rate foreign exchange risk as important as all the other industry sectors.

This survey established that MNCs placed more emphasis on transaction risk and less emphasis on translation risk, particularly in the USA where over one third of
respondents rated translation exposure as least important. However, the largest of the MNCs placed highest emphasis on translation exposure, which could be explained by the larger amount of overseas investments held by these MNCs. Economic risk received mixed emphasis, although a higher proportion of Asia Pacific MNCs placed more importance on it. Again the service industry gave this risk a low priority. The emphasis placed on transaction risk because it affects short-term financial results that require immediate attention from the management.

There are a large number of internal and external methods of managing translation and transaction exposure. The key issues to be addressed by this research are to determine which methods are used for translation and transaction exposures. It was found that, for translation risk, the main internal method used is balance sheet hedging method while matching and netting are the predominantly internal methods for managing transaction risk. The most popular external method for managing translation and transaction exposures is the forward contract, although currency swaps are also faddish among the UK respondents for managing translation exposure. The results revealed that a majority of MNCs do not favour the exchange-traded instruments such as currency futures and options on currency futures. However, Asian Pacific MNCs were more likely to use a larger number of external instruments and the exchange traded instruments. The industry sector was an important determinant in the use of external derivatives, especially the exchange-traded derivatives. Due to the experience in other types of derivatives, such as commodity, and the nature of their operations some MNCs sectors, such as transport and utility, have moved on from the forward contract and are comparatively the highest users of currency futures.

The literature suggests that there is a strong case for managing economic exposure because it creates uncertainty on the future cash flow positions of a company and subsequently affects its competitive stance. A number of the samples did not manage economic exposure citing reasons such as it is difficult to quantify, or there is lack of effective tools to deal with the complexity of the exposure. The key issue for those who manage this risk is the selection of method for managing economic exposure. It was found that pricing strategy such as price variations and currency of invoicing are the most widely used method, however, there was a significant difference between the regions. Pricing strategy is more popular because it requires a short lead-time to implement compared to the other methods. Nonetheless, there are a wide range of methods used by a number of MNCs in all the regions, indicating, as would be expected due to the nature of this risk that there is no definite method in dealing with economic risk.

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Appendix. Chi-squared tests of the association between the response and the region, size, % of overseas business and industry sector

<table>
<thead>
<tr>
<th>Region</th>
<th>Size</th>
<th>% of overseas business</th>
<th>Industry</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Objectives of managing foreign exchange risk</td>
<td>11.7454 (6)*</td>
<td>11.7151 (9)</td>
<td>3.8714 (9)</td>
</tr>
<tr>
<td>Emphasis on economic exposure</td>
<td>17.3274 (8)**</td>
<td>14.4167 (12)</td>
<td>14.3782 (12)</td>
</tr>
<tr>
<td>External methods for managing transaction exposure</td>
<td>16.5561 (10)*</td>
<td>4.9758 (15)</td>
<td>4.2164 (15)</td>
</tr>
<tr>
<td>External methods for managing translation exposure</td>
<td>30.8545 (10)**</td>
<td>28.3451 (15)**</td>
<td>11.1365 (15)</td>
</tr>
</tbody>
</table>

*a The size quartiles were based on total sales from the information from the 1998 financial statements. Information was obtained from Datastream. The % of overseas business was given by the respondents on their questionnaires. The industry sector was obtained from the Extel Company research database. Due to the small numbers involved the question on ‘the reasons for not managing economic risk’ was not considered.

* Significant at 10% level. ** Significant at 5% level. *** Significant at 1% level.
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