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MNE Internal Capital Markets and Subsidiary Strategic Independence

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Abstract

It has been suggested that the primary function of headquarters in a multi-divisional enterprise is to run an internal capital market in which scarce project finance is transferred from lagging units to those, which have strategic promise. Such a headquarters role is particularly relevant in multinational enterprises (MNEs). It is proposed that the granting of strategic independence to subsidiaries may reduce the ability of headquarters to control their resources and thereby reduce the efficiency of the internal capital market. This is likely to have adverse effects, reducing and perhaps reversing the 'localisation' benefits of subsidiary strategic independence. Using a cross-sectional data set of UK subsidiaries of non-UK MNEs, strong evidence is found for the working of internal capital markets. It appears that subsidiary strategic independence does impede the working of these markets.

KEYWORDS: *MNE-subsidiary relations, internal capital markets*

INTRODUCTION

The role of a firm's headquarters in its relationship with the operating units has been the subject of considerable recent interest. One of the reasons for this interest has been the changing role of subsidiaries of multinational enterprises (MNEs). Subsidiaries of MNEs are expanding their role beyond traditional downstream activities like sales, service and assembly to encompass upstream activities like research and development (R&D), component production, strategic marketing and support activities [Bartlett and Ghoshal 1989, Gupta and Govindrajana 1991, Taggart 1996a, Cantwell 1997]. In this context, MNEs have been consolidating their subsidiaries to give them geographic or product range responsibilities [Hood, Young and Lal 1994, Birkinshaw 1995].

The process of consolidation creates both winners and losers – some units receive broader mandates and responsibilities while others are slimmed down or closed altogether. These decisions are typically made at headquarters and often involve channelling resources within the firm. There is a recent body of literature suggesting that the primary function of the headquarters is to run this internal capital market, which effectively re-distributes resources within the firm [Shin and Stulz 1996, Lamont 1997, Stein 1995, 1997].

Further, it is argued that the effectiveness of this internal capital market increases with the noise in headquarters' information flows. Note that since the managers of various subsidiaries are in competition with each other for resources allocated by headquarters, they have an incentive to overstate the value of their projects. As headquarters' ability to assess the true value of subsidiary projects declines, the value of the internal capital market as an allocation mechanism increases. Thus, internal capital markets are likely to be most

effective in MNEs where geographical and cultural distances create the greatest chance that inaccuracies in information are difficult to pinpoint.

The question addressed in this paper concerns the relationship between the mandate of the subsidiary and the extent to which it is an active part of the internal capital market. In other words, does the acquisition of a broad mandate by a subsidiary reduce headquarters' control over its resources? The answer to this question has important implications for headquarters and subsidiary strategies within MNEs. If the breadth of the mandate of the subsidiary does not affect the ability of headquarters to control its resources, then the formation of strategically independent subsidiaries with global mandates is always beneficial for MNEs. The advantages of globalisation derived from headquarters are reinforced by the advantages of strategic decision-making at the local and regional level. However, if increasing the scope of a subsidiary's mandate reduces headquarters' ability to control its resources, then the advantages of subsidiary strategic independence must be offset against the reduced efficiency of the MNE's internal capital market.

This view of headquarters-subsidiary financial relations is examined using a cross-sectional data set of MNEs operating in the UK. The empirical results offer considerable support for the proposed hypothesis. These results are of considerable importance to MNE managers since they suggest that the devolution of strategic responsibilities to subsidiaries must consider the impact on the firm's internal capital market. In particular, in situations where the internal capital market is most useful, strategic decision-making is best retained at the firm's headquarters. It has been suggested that such situations are those where the external capital markets are relatively undeveloped so that information and agency

problems are particularly pronounced [Stein 1997]. Conversely, where external markets are very well-developed, the additional gains from internal markets are likely to be small, so that strategic devolution is more likely to be a net benefit to the firm.

RESEARCH QUESTIONS AND METHODOLOGY

The basic question concerns the relationship between a subsidiary's strategic independence and the MNE headquarters' control over its financial resources. The question of a subsidiary's strategic independence has been the subject of a large literature in international business, so a comprehensive literature survey will not be attempted here. Good reviews are available in Birkinshaw (1994) and Birkinshaw and Morrison (1995). In addition, a large and focused literature has been developed by Nordic scholars [see, for example, Andersson and Forsgren 1995, Forsgren, Holm and Johansen 1995, Forsgren and Johansen 1992, Holm 1992]. Many taxonomies of subsidiary types are available in the literature. A taxonomy relevant for the current study is drawn from D'Cruz (1986) and Moore (1995) and presented as Figure 1.

- FIGURE 1 ABOUT HERE -

A movement towards the bottom right cell in this simple taxonomy captures devolution of increasing strategic responsibilities. If such movement is accompanied by reduced headquarters control over subsidiary financial resources, then the devolution incurs costs in the form of reduced internal capital market efficiency. This reduced efficiency is likely to be a hindrance to the MNE if it has other subsidiaries with good strategic prospects, operating in locations where external capital markets are relatively poor. Its strategically independent subsidiaries will reduce its ability to channel aid to those subsidiaries through

its internal capital market. In contrast, a negation of the above hypothesis implies that increasing the scope of the subsidiary's mandate can be one of the best ways to capture the MNE's inherent strategic advantages.

It is necessary at this point to address some important issues. First, it is important to make a distinction between the MNE's central treasury function and its internal capital market. Both are concerned with the management of the financial resources of the entire enterprise, but there is a difference in their decision horizons. The treasury department's focus is mainly on short-term cash management and on efficient financial structure. Its concerns are more tactical and therefore short term. The internal capital market is concerned with long-term project finance and considerations of the MNE's geographic and product focus. It factors in the covariance of returns on different projects and takes into consideration the issues of capital budgeting and investment appraisal. All this requires taking a strategic and long-term view of the firm as a whole.

Second, do weakened internal capital markets really matter that much? It may be argued that independent subsidiaries that act as profit centres can tap external capital markets (where they are well developed) and so that the winning and losing subsidiaries within the MNE can be picked and monitored externally. Further, if such strategic independence makes subsidiaries more dynamic, then it is a net benefit for the MNE. There are two points that need to be made here. First, as pointed out by Stein (1997), the external capital market can only grant or not grant financial support to subsidiary projects. It cannot transfer funds across projects. Thus, it serves to reinforce, rather than alleviate the unit-focused biases of the subsidiary managers. The major role of the internal capital

market is to overcome these biases. Second, while it is possible that strategic independence *per se* makes subsidiaries more dynamic, the point of this paper is that this may have some cost in terms of efficiency.

Third, the issue of power, while not explicitly addressed in this paper, is an important latent factor. Whether subsidiary mandates are granted or taken is an open question [Doz and Prahalad 1981, Forsgren, Holm and Johansen 1995]. Headquarters may have little control of any kind over powerful subsidiaries, making the issue of control their financial resources moot. This point is related to the second point above, for if subsidiaries operate with complete independence and the role of headquarters is limited, it is inevitable that a substantial portion of the benefits of globalisation will be lost. This is not to deny that there are strong forces pushing the MNE towards such a ‘multi-domestic’ strategy (Buckley and Carter 1998, Casson 1987, 1994).

Methodology: The MNE and its subsidiaries are engaged in a principal-agent relationship. Both the internal capital market and subsidiary strategic independence must be implemented through the incentives given to the local managers. It is therefore assumed that the incentive compatibility constraints emerging from the underlying principal-agent model are satisfied.

The relationship of interest, concerning the functioning of the MNE’s internal capital market, can be thought of as a reduced form conditioned on the system of managerial incentives.¹ This reduced form can be represented by the relationship between the financial outflows from the subsidiary to its MNE parent and variables measuring the performance of the subsidiary relative to the MNE’s other operations, as well as variables measuring the relative attractiveness of the subsidiary’s location.

The objective of this paper is to test for the effect of subsidiary strategic independence on headquarters control of its financial resources. This is done by adding variables measuring subsidiary strategic independence to the above relationship. Denoting the net financial flows from the subsidiary to its MNE parent by NF_t , the relationship to be estimated is:

$$(1) NF_t = f[(\text{Subsidiary performance measures})_t, (\text{Location attractiveness})_t, (\text{Subsidiary strategic independence})_t]$$

The two research hypotheses may be formally stated as follows:

¹ Subsidiary strategic independence may create divided loyalties in managers, who may now have the opportunity to choose between the local operation and the MNE parent. The incentive structure is likely to influence the managers’ allegiance, supplementing the effects of culture. The possibilities based on cultural background can be summarised as follows:

| | | Allegiance to local operation | |
|---------------------------------|-------------|--------------------------------------|----------------|
| | | <i>Low</i> | <i>High</i> |
| Allegiance to MNE parent | <i>Low</i> | Free agents | Local managers |
| | <i>High</i> | Expatriate managers | Dual nationals |

Adapted from Black *et al* (1992)

The objective of the incentive structure is to influence managers’ behaviour to mimic that of dual nationals.

H1: The headquarters of an MNE operates an internal capital market, in which financial resources are transferred from one subsidiary to another on the basis of the overall strategic prospects and fit.

H2: Subsidiary strategic independence impedes the working of this internal capital market in the MNE.

The two hypotheses are nested, in the sense that H2 becomes relevant for testing only if H1 is not rejected. Statistical significance of the variables from the first two groups confirms the working of an internal capital market in MNEs (H1). A significant and negative impact of variables from the third group supports the hypothesis that increasing strategic independence of the subsidiary impedes the working of this internal capital market (H2).

DATA AND ESTIMATION

Data was obtained in two stages. In the first stage, a list of MNE engineering and engineering-related operations in the West Midlands region of Britain was compiled from business directories. All the firms were non-UK firms with subsidiaries operating in the UK. The region was chosen because it has been Britain's most successful region for attracting inward investment, with more than 900 companies investing over £3 billion and employing over 100,000 workers (Griffiths, 1993). After phone confirmations, a final list of 224 companies with personal contact names was assembled for the purpose of a directed mail survey.

The questionnaire was accompanied by a cover letter explaining the aims of the study, guaranteeing confidentiality and urging response. In order to improve the response rate, the questionnaire had to be short, concise and of current interest (salient) to the respondent (Heberlein and Baumgartner 1978). Ten days after the survey was mailed out, a reminder postcard was sent to all companies that had not yet responded.

Overall, 85 responses were received to the mail survey (37.9%). Of these, four were found to be national firms mistakenly identified as MNEs and seven were unusable for various other reasons, leaving 74 (33.0%) valid responses for evaluation. The response rate is well within the range expected for an unsolicited mail survey. The survey collected information on measures of strategic independence of MNE subsidiaries, net capital flows out of the UK subsidiary, the rate of return on corporate liquid funds and measures of corporate risk.

In the second stage, several international statistics were computed for the host countries of the MNEs in the sample. These statistics were obtained from *International Financial Statistics* published by the International Monetary Fund. In addition, country risk indices were drawn from the capital markets publication *Euromoney*.

Survey responses were cross-checked against company annual reports where possible. Some variables could be checked for the entire received sample (global sales, employment, geographic and functional scope of the UK subsidiary's mandate and duration of UK operations). Others could only be checked for a majority of firms, while some very specific variables were not reported in published data. A high degree of correspondence between published data and survey responses was found, supporting the veracity of the survey responses. This is particularly important in the case of financial flow data between the subsidiary and its parent, since this can be subject to a number of distortions arising from transfer pricing. Published data is generally considered reliable since most MNEs minimise risks of being penalised by authorities by following a 'whiter than white policy' (Coates *et al* 1993).

Non-response bias was investigated with the widely used method suggested by Armstrong and Overton (1977). This involved comparing early and late respondents. Late respondents were defined to be those who responded after receiving the reminder postcard. Six sample measures were compared using a χ^2 test of independence. The responses from early and late respondents were virtually identical.

The variables assembled for use in the study correspond to the requirements of estimating equation (1). The dependent variable is the net financial outflow from the UK subsidiary to its overseas parent.

The first set of explanatory variables relates to subsidiary performance and location attractiveness. The variables were drawn following the literature on international investment decision-making [Bettis and Hall 1982, Bettis and Mahajan 1985, Shapiro

1986, Mudambi 1995, Chenells and Griffith 1997, Eun and Resnick 1998]. The variables relating to subsidiary performance measure the risk and return associated with the UK subsidiary's operations, relative to the MNE's overall operations. The variables relating to location attractiveness include an index of relative location risk (whose component parts include macroeconomic indicators and overall financial sector risks), exchange rate risks and relative tax rates. (See Appendix 1 for a detailed description of the variables.)

The second set of variables relates to subsidiary strategic independence. These variables were drawn from selected studies on MNE-subsidiary relationships [Rugman (1981), D'Cruz (1986), Prahalad and Doz (1987), Roth and Morrison (1992), Birkinshaw (1996), Birkinshaw and Morrison (1995), Moore (1995), Taggart (1996b) and Mudambi and Mudambi (1997)]. The variables measure the extent of the local operation's R&D and exports, the extent of local decision-making regarding suppliers, human resource management and process engineering, the functional and geographic scope of the subsidiary's output mandate and the duration of the subsidiary's operations in the UK. (See Appendix 1 for a detailed description of the variables.)

The estimation of equation (1) is carried out using multiple regression analysis. The net flows from the subsidiary to its parent (NF94) is the dependent variable in the analysis, while the subsidiary relative performance measures, relative location attractiveness and subsidiary strategic independence measures are the explanatory variables.

The first set of variables, i.e., those relating to the relative performance of the subsidiary and the relative attractiveness of the UK as a location are metric and can be used directly in the estimation of equation (1). However, two problems arise in using the variables in

second set, i.e., those measuring the subsidiary's strategic independence. Firstly, several of them are categorical and/or ordinal. Secondly, several of them are highly correlated with each other. These reasons mean that they are unsuitable for direct use as regressors.

Factor Analysis: The problems are addressed by constructing statistical variables to summarise the information content along identifiable dimensions. This is done by running all the variables in the second set through principal component factor analysis. The latent root criterion is used to determine the number of factors (or summary variables) extracted. The rationale is that the variation in each variable is unity after the variable has been standardised. Thus, each factor should account for the variation in at least one variable if it is to be considered useful from a data summarisation perspective (Churchill 1995).

The factor analysis results are presented in Table 1. There are three factors with eigenvalues greater than unity. The eigenvalue for the fourth factor is 0.6315. The three factors extracted may be termed 'strategic responsibilities' (STRAT), 'external orientation' (EXTERNAL) and 'process responsibilities' (PROCESS), on the basis of the varimax rotated factor loading matrix.

The first factor, 'strategic responsibilities', explains 33.2% of total variance. The extent to which supplier decisions are made by the subsidiary (SUPPLY), the amount of subsidiary R&D, the functional scope of the subsidiary's activities (FSCOPE) and the experience of the subsidiary in the location (DT) all load heavily on this factor.

The second factor, 'external orientation', explains 27.4% of total variance. The geographic scope of the subsidiary's output mandate (GSCOPE), the percentage of its output that is exported (WEXPORT) and its export experience as a percentage of total tenure (EXPt) are the variables that load heavily on this factor.

The third factor, 'process responsibilities', explains another 16.5% of total variance. The subsidiary's responsibilities in process engineering (PROC) and training (TRAIN) are the variables that load heavily on this factor. In interviews with managers at several of the responding firms, it became clear that a considerable amount of training that occurred at these subsidiaries was of the operational or process type. This would explain the loading pattern that emerged.

Overall, the first three factors account for over 77% of the variance of all the underlying variables. The communalities of individual variables are very high as well, with the lowest value in excess of 70% and a high in excess of 90%.

Regression Analysis: The objective of this analysis is to estimate equation (1). The base-line estimation is carried out using ordinary least squares (OLS). These estimates are presented in Table 2. However, as the subsidiaries varied considerably in terms of size, there was reason to suspect heteroscedasticity. This is because the net outflows of large subsidiaries have a much greater potential variation than the net outflows of smaller ones. This translates into conditional variances that vary systematically with subsidiary size, which means that the OLS estimators are inefficient. This suspicion is confirmed by observing the results of the Breusch-Pagan test for heteroscedasticity, which is comprehensively failed (see Table 2).

This problem is addressed in three separate ways. First, the standard errors are re-estimated using White's heteroscedasticity-consistent variance-covariance matrix. This allows the estimated errors themselves to serve as scaling factors in adjusting the estimated conditional variances. The use of White's matrix generally results in improvements in the values of individual 't' statistics, as would be expected.

Second, weighted least squares (WLS) estimates are generated. These results are also presented in Table 2. The employment of the subsidiary (EMPL) is used as the proxy for size. The use of employment as the proxy for size is justified on the grounds that the firms are all in closely related lines of business, so that fundamental differences in the employment-size relationship are unlikely. The procedure is successful in correcting the heteroscedasticity problem, as the Breusch-Pagan test is now passed (see Table 2).

Third, maximum likelihood estimates are generated using a linear model of multiplicative heteroscedasticity, again using EMPL as the proxy for subsidiary size. These results are presented in Table 3. The estimates of the variance process are found to fit extremely well, suggesting both the existence of and the successful correction for the heteroscedasticity problem.

Results: Before considering the results in detail, two salient points are worth noting.

First, examining the diagnostics, all the estimates provide very good fits to the data.

Second, looking at the pattern of significance of parameter estimates, there is a remarkable degree of agreement. This is particularly notable when comparing the least squares and maximum likelihood estimates, which are generated through different estimating methodologies.

Two hypotheses are under test here. The internal capital markets hypothesis is examined first. Virtually all the variables relating to the firm's internal capital market emerge as statistically significant, the only exception being the rate of return on subsidiary free funds (RORFF) in the maximum likelihood estimation. (Even here, the acceptance of the null hypothesis of insignificance is marginal.) Further, the signs of the estimated coefficients are as predicted by theory.

As the excess return in the subsidiary (ABROR) decreases and its financial (RISK) and relative locational risks (RLOCRSK) increase, net outflows increase. As available local rate of return on liquid funds (RORFF) and the relative local tax advantage (TAX) increase, net outflows decline.

The effect of the exchange rate ($\Delta EXRT$) on financial flows is likely to depend on a number of conflicting considerations. On cost considerations, net outflows will increase as the local currency appreciates [Stevens 1993]. However, the impact of currency appreciation is unclear when adding in the consideration of local production versus imports. Imports become cheaper and may substitute for local production, but profits from local production become higher when translated into home country currency. On balance, it is found that an increasing exchange rate is associated with lower outflows.

Thus, the evidence in favour of the internal capital markets hypothesis is quite convincing. The results do support the contention that MNE headquarters use their control to transfer financial resources into or away from subsidiaries depending on their relative performance within the group. Subsidiaries that are lagging the group as a whole display larger

outflows of financial resources, suggesting that resources are being transferred away from them.

The second hypothesis under test is the relationship between the strategic independence of subsidiaries and the effectiveness of headquarters' control over their financial resources. Here the results are strong, but not as comprehensive. The level of subsidiary strategic responsibility (STRAT) appears significantly in all estimations and its influence is negative, as suggested by the hypothesis. As STRAT increases, the net outflows from the subsidiary to the parent, normalised for relative performance factors, decline. In other words, if the subsidiaries of two MNEs have the *same* level of relative performance within their groups, the one with the higher level of strategic responsibility experiences lower net outflows to its parent.

A second supporting test confirms this finding. An 'F' test is run on the least squares estimates to examine the exclusion restriction on the subsidiary strategic independence variables. An identical exclusion restriction is tested on the maximum likelihood estimates using a likelihood ratio test. In all cases the exclusion restriction is strongly rejected, supporting the contention that subsidiary strategic independence affects net outflows, even after normalising for relative performance.

The two other measures of subsidiary strategic independence do not appear as strongly in the estimates. The EXTERNAL variable exerts a significant negative effect in the maximum likelihood estimation and the PROCESS variable does the same in the WLS estimation. This is further evidence supporting the proposed hypothesis. The relatively weaker statistical performance of these variables may be ascribed to the fact that they are

the second and third extracted factors respectively and consequently capture less of the variation of the underlying variables. This is particularly true in the case of the PROCESS variable.

CONCLUDING REMARKS

It has been recently suggested that the major role of headquarters in a multi-unit firm is to run an internal capital market, re-distributing financial resources on the basis of its relatively unbiased evaluation of the various units' prospects. It is argued here that this role is particularly relevant to the headquarters of an MNE. In addition to the advantages available to a domestic multi-unit firm, an MNE can generate arbitrage profits through many other channels that derive from its operating in a number of different jurisdictions. These include re-invoicing centres, fee and royalty adjustments, leading and lagging, intra-corporate loans (back-to-back financing, currency swaps, etc.) shifting compensating balances, dividend adjustments and choice of invoicing currency (Lessard 1979, Emmanuel and Mehafdi 1994, Eun and Resnick 1998).

While strategically independent subsidiaries are not new (Chapman 1985), they were a declining organisational form for several decades after 1945. Over the last decade or so, there has been a resurgence of this organisational form as MNE managements seek to gain location specific and consolidation advantages. It is suggested here that such strategic independence may reduce MNE headquarters' control of their subsidiaries resources, reducing the efficiency of their internal capital markets.

In a large sample of engineering and engineering-related subsidiaries of non-UK parent MNEs, the working of the internal capital market is strongly supported. Further, and more importantly from the perspective of this study, subsidiary strategic independence appears to impede the working of this internal capital market.

In order to assess the managerial implications of these results, it is necessary to consider the advantages gained from the efficient working of the internal capital market in the MNE as a whole. It has been suggested that efficient internal capital markets are particularly valuable in environments where external capital markets are poor. Thus, while the external capital markets in the UK are good, an MNE will feel the ill effects of the 'sand in the wheels' of its internal capital market so long as it has other subsidiaries in countries or regions where external capital markets are underdeveloped. This is because it will find that the strategic independence of one subsidiary will reduce its ability to take advantage of strategic opportunities in another.

APPENDIX 1

VARIABLE DEFINITIONS

Subsidiary performance and location attractiveness

| | |
|---------------|---|
| RISK | = Variance of UK subsidiary's rate of return on capital, 1986-1994. |
| ABROR | = Excess (or shortfall) of subsidiary's rate of return on capital relative to the MNE's overall rate of return on capital, 1994. |
| RORFF | = Rate of return on subsidiary liquid funds (free cash flows as defined by Jensen (1988)), 1994. |
| RLOCRSK | = Percentage differential in location risk (Home country/host country (UK)); <i>Euromoney index</i> , 1994. |
| Δ EXRT | = Percentage change in exchange rate, risk (Home country/host country (UK)), 1993-94. |
| TAX | = Percentage differential in corporation tax rate (Home country/host country (UK)); 1994. |
| NF94 | = Net financial outflows from subsidiary to its MNE parent, i.e., all outflows of dividend payments, royalties, overhead charges, license and management fees and miscellaneous transfers, less inflows of capital from the parent, but excluding capital raised directly by the subsidiary in the UK market, 1994. |

Subsidiary strategic independence

| | |
|-----|---|
| R&D | = Local research and development spending as a percentage of subsidiary turnover, 1994. |
|-----|---|

| | |
|---------|--|
| SUPPLY | = Extent to which decisions on suppliers are made locally (7 point scale). |
| FSCOPE | = Functional scope of output mandate: 1 = sales and service, 2 = assembly, 3 = Manufacturing, 4 = Product development, 5 = international market development. |
| DT | = Duration of subsidiary operation in the UK in years, 1994. |
| GSCOPE | = Geographic scope of subsidiary's output mandate: 1 = UK only, 2=Europe, 3=worldwide. |
| WEXPORT | = Exports as a percentage of UK subsidiary turnover, 1994. |
| EXPt | = Duration of subsidiary export operations as a percentage of total duration of UK operations, 1994. |
| PROC | = Process engineering responsibilities (7 point scale). |
| TRAIN | = Extent to which subsidiary has responsibility for training. |
| EMPL | = Employment in UK subsidiary ('000s), 1994. |

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TABLE 1
FACTOR ANALYSIS OF SUBSIDIARY STRATEGIC INDEPENDENCE
Factor Loadings and Communalities

(Varimax Rotation)

| <i>Variable</i> | Factor Loadings | | | <i>Communality</i> |
|-------------------|---------------------------|------------------------------|-----------------------------|--------------------|
| | <i>Factor 1 STRAT</i> | <i>Factor 2 EXTERNAL</i> | <i>Factor 3 PROCESS</i> | |
| SUPPLY | 0.861 | 0.237 | 0.017 | 0.798 |
| R&D | 0.821 | 0.064 | 0.150 | 0.701 |
| FSCOPE | 0.893 | -0.031 | 0.000 | 0.799 |
| DT | 0.830 | 0.227 | 0.190 | 0.777 |
| GSCOPE | 0.129 | 0.845 | -0.192 | 0.768 |
| EXPt | 0.116 | 0.857 | 0.053 | 0.751 |
| WEXPORT | 0.111 | 0.947 | 0.047 | 0.912 |
| PROC | 0.213 | -0.003 | 0.810 | 0.701 |
| TRAIN | 0.008 | -0.056 | 0.853 | 0.731 |
| <i>Eigenvalue</i> | 3.5597 | 2.0970 | 1.2813 | - |
| Variance | 2.9908 | 2.4621 | 1.4851 | 6.9380 |
| % Variance | 0.332 | 0.274 | 0.165 | 0.771 |

Loadings of variables associated with particular factors are shown in bold.

TABLE 2**LEAST SQUARES ESTIMATES OF THE NET FINANCIAL FLOW EQUATION***Dependent Variable: NF94*

| Regressor | OLS Estimates | WLS Estimates (Wts.=EMPL) |
|---|--------------------------------|------------------------------|
| Constant | -0.339 (1.19) <i>(1.23)</i> | 0.393 (1.09) |
| ABROR | -3.262 (1.98) <i>(2.62)*</i> | -3.003 (2.16)* |
| RISK | 0.0960 (6.05)* <i>(5.25)*</i> | 0.0967 (6.98)* |
| RORFF | -12.264 (2.29)* <i>(2.35)*</i> | -25.741 (3.92)* |
| RLOCRSK | 0.00265 (2.53)* <i>(3.17)*</i> | 0.00190 (2.07)* |
| Δ EXRT | -2.307 (3.89)* <i>(5.21)*</i> | -1.534 (2.47)* |
| TAX | 0.250 (2.97)* <i>(3.10)*</i> | 0.184 (2.12)* |
| STRAT | -0.511 (5.65)* <i>(6.32)*</i> | -0.529 (5.96)* |
| EXTERNAL | -0.0956 (1.40) <i>(1.46)</i> | 0.00979 (0.11) |
| PROCESS | -0.0278 (0.41) <i>(0.46)</i> | -0.194 (2.62)* |
| <i>Diagnostics</i> | | |
| Adj.R ² | 0.8456 | 0.8791 |
| 'F' Stat; (d.f.) | 45.42; (9, 64) | 59.97; (9,64) |
| Joint exclusion restriction on subsidiary strategic independence coefficients 'F' Stat; (d.f.) | 13.981; (0.000) | 14.737; (0.000) |
| Breusch-Pagan Test: $\chi^2(9)$; (p value) | 29.724; (0.000) | 8.108; (0.523) |
| Akaike IC | 1.597 | 2.160 |

NOTES:

(1) 't' statistics in brackets. Those calculated using White's heteroscedasticity-consistent variance-covariance matrix are shown in italics.

(2) Estimates significant at the 5% level are marked with a '*'.

TABLE 3**MAXIMUM LIKELIHOOD ESTIMATES OF THE NET FINANCIAL FLOW EQUATION***Dependent Variable: NF94*

| Regressor | Linear Model with Multiplicative Heteroscedasticity (Wts.=EMPL) |
|--|--|
| Constant | -0.497 (2.00)* |
| ABROR | -3.161 (2.20)* |
| RISK | 0.0983 (6.18)* |
| RORFF | -9.121 (1.94) |
| RLOCRSK | 0.00280 (2.92)* |
| Δ EXRT | -2.494 (4.74)* |
| TAX | 0.255 (3.38)* |
| STRAT | -0.508 (6.40)* |
| EXTERNAL | -0.121 (2.06)* |
| PROCESS | 0.00878 (0.15) |
| <i>Estimates of the (Log-linear) Variance Process</i> | |
| $(S_u)^2$ | 0.1464 (8.44)* |
| EMPL | 0.0203 (2.08)* |
| <i>Diagnostics</i> | |
| Log-Likelihood | -47.0518 |
| Restricted Log-Likelihood | -49.0937 |
| LR Test $\chi^2(1)$; p value | 4.0838; (0.0433) |
| Joint exclusion restriction on subsidiary strategic independence coefficients LR Test $\chi^2(3)$; p value | 38.9328; (0.000) |
| Iterations | 13 |

NOTES:

- (1) The estimated model sets the conditional variance as a log-linear function of subsidiary size as measured by employment (EMPL).
- (2) 't' statistics in brackets. Estimates significant at the 5% level are marked with a '*'.
*.

FIGURE 1

MNE SUBSIDIARY TYPES

| | | <i>Extent of Strategic Decision-making</i> | |
|---|----------|--|--------------------------------|
| | | Low | High |
| <i>Extent of Responsibilities</i> | National | Local Assembly | National Mandate |
| | Regional | Regionally Rationalised Assembly | Regional Subsidiary Mandate |
| | Global | World Product Mandate | Global Subsidiary Mandate |

Adapted from D'Cruz (1986) and Moore (1995).