Foreign Exchange Exposure: An Investigation of the Determinants in the UK Multinationals

Ibrahim Zubairu[1], Ahmed Jamal Iddrisu[2]

[1]Department of Accounting and Finance, Accra Technical University, Accra, Ghana

[2]Department of Banking and Finance, University of Professional Studies, Accra, Ghana

Email address:

Ibrazubairu@yahoo.com (I. Zubairu), ahmedjamal209@gmail.com (A. J. Iddrisu)

Abstract: The purpose of this study is to investigate the determinants of differential exchange exposure across listed UK Multinational Corporations (MNCs) from 1993-2013, so as to identify their relationships regarding their foreign operations as listed on the FTSE 350 Index. The study used quantitative analysis to reach its conclusions. This involves a time series regression analysis which was used to compute the foreign exchange exposure co-efficient. The conclusions from this analysis are summarized. Data was collected from accounting footnotes of financial statements from FAME and the DataStream on Compustat Geographical system database; while annual data updated annually about trade weights within the region was obtained from the International Monetary Fund's Directory of Trade statistics yearbook. The results suggest that 20% of the sampled MNCs have statistically significant exposure at the 5% level significance, and the regression estimates of the determinants of exchange rate exposure suggests that, the level of a firm's foreign sales, market value of its equity, and quick ratio, have strong combined explanatory power for exposure. The cross-sectional differences in the degree of exchange rate exposure are negatively related to firm size and positively related to the degree of foreign operation. Firm liquidity is shown to be a determinant of exchange exposure. Other firm characteristic variables have weak or are of no significance in terms of explaining exposure. The results from this empirical study build upon prior studies on foreign exchange exposure and offer the MNCs an alternative approach to minimize their inputs when operating in a developed market.

Keywords: Foreign Exchange Exposure, UK Multinationals, FTSE350, Hedging Incentives,
Firm-Specific Factors and Industry Characteristics

1. Introduction

The debate regarding the foreign exchange rate exposure in the UK Multinational Corporations has been largely limited to the firms with significant foreign exposure estimates using firm-specific principal currency data compared with those exposure estimates using broad exchange rate index data. This has been a long-standing issue and has been a major concern in the literature of international financial economics and reported severally in prior studies [1-9].

In the present world of increasing globalization and heightened currency volatility, changes in exchange rate have substantial influence on companies operations and profitability. Exchange rate volatility affects not just multinationals but also other corporate bodies; be they small or medium size enterprise including all those that only operate in their home country. The study [10] posits that, while understanding and managing exchange risk is a subject of significant importance to business owners, investors should also be familiar with the huge impact it can have on their investment holdings.

The purpose of this paper is to explore the determinants of differential exchange exposure across listed UK Multinationals Corporations (MNCs). Cross-sectional differences in exchange exposure are investigated by testing whether foreign exchange exposure depended on firm-specific variables as well as the characteristics of industry to which each firm belongs. The studies [11, 12] also examine the effects of firm-specific variables and the choice of model structure. Firm specific factors used in this study include the

level of a firm's international operations, the size of the firm, long-term debt ratio, book to market value of equity, liquidity and R&D (scaled for size). Industry characteristics include the export and import ratio. These factors impact economic exposure. Exchange rate exposure is one component of economic exposure. This paper tries to verify whether some of the factors that determine economic exposure also impact foreign exchange exposure.

Ordinary Least Square (OLS) regression estimates of the determinants of exchange rate exposure suggest that the cross-sectional differences in the degree of exchange exposure are negatively related to firm size and positively related to the degree of foreign operation. Firm liquidity is shown to be a determinant of exchange exposure. Other firm characteristic variables have weak or no significance whatsoever in terms of explaining exposure.

2. Propositions for the Study

This examines the basis of estimating foreign exchange exposure, the determinants of the exchange rate exposure, where firm specific and industry factors are explored. Companies are exposed to three main types of risk caused by currency volatility; and these include: transaction exposure, translation exposure, and economic exposure.

The transaction exposure arises from the effect that, exchange rate fluctuations have on a company's obligations to make or receive payments denominated in foreign currency and can be short-term or medium-term in nature. The translation exposure arises from the effect of currency fluctuations on a company's consolidated financial statements, especially when it has foreign branches of subsidiaries; and this can be medium-term to long-term in nature. The economic exposure also known as operating exposure is caused by the effect of unexpected currency fluctuations on a company's future cash flows and market value; and it is usually long-term in nature. This exposure is not popularly known like the transaction and translation. However, it poses a significant risk, and its impact can be substantial as unanticipated exchange rate changes and this can greatly affect a company's competitive position, even if it operates locally and does not operate or sell overseas. Economic exposure by definition is impossible to predict because companies prepare their budget and forecast for the future based on certain assumptions which represent their expected change in currency rates. While transaction and translation exposure can be accurately estimated and therefore hedged, economic exposure is difficult to quantify precisely and as a result challenging to hedge.

2.1. Estimation of Foreign Exchange Exposure

Exchange rate exposure was empirically examined by prior studies [2, 6, 8, 13-15]. In this study however, the following augmented market model was used to estimate the exchange exposure in common stock returns:

$$R_it = \alpha_ot + \alpha_1t\ TRWXt + \alpha2_iRmt + \varepsilon_it\ `\ t = 1... T, \qquad (1)$$

Where; R_{it} is the rate of return on the ith firm's common stock in period t

$TRWX_t$ is the percentage change in trade and regional sales-weighted average exchange rate index, measured as the dollar price of the foreign currency in period t. R_{mt} is the rate of return on the CRSP value-weighted market index.

This study examines the exchange rate exposure of a sample of listed UK Multinational firms from January 1993 to December 2013. All firms chosen for inclusion in the sample are a subset of all the FTSE 350 firms that have active international activities. Active international activities are defined as foreign operations that account for more than 10% of total operations. In Equation (1) β_{1i} the slope coefficient of the regression is the exchange-rate exposure measure, because it measures the sensitivity of stock returns to unexpected changes in exchange rates.

2.2. The Determinants of Exchange Rate Exposure

The sensitivity of firm returns to changes in the value of the domestic currency depends on firms' operating profiles, financial strategies, and industry characteristics. Furthermore, the measured ex-post exchange rate exposure of firms also depends on the extent to which they use hedging strategies to reduce their exposure to currency fluctuations. Firms that effectively hedge against unfavorable currency fluctuations may have little or no measured exposure during a given time period. Since data is not available on the hedging activities of the firms for the entire 20 year period, the use of derivates was not considered. It is significant to indicate that, hedging strategies are employed in order to limit the transaction exposure toward exchange rate, fluctuations on future revenues and costs, committed and forecasted future sales and purchases in major currencies. Foreign exchange exposure differs from foreign exchange risk. While foreign exchange exposure is the degree to which a company is affected by changes in exchange rates, and is difficult to manage largely due to imports and exports, foreign exchange risk is concerned with the change of value in one currency relative to another which will reduce the value of investments denominated in a foreign currency, and this can be mitigated through the use of hedging techniques, less volatile currency to report results and can be in the form of transaction, translation and economic risk.

It follows that characterization of exchange rate exposure as a function of firm-specific variables presumes that the exchange rate exposure faced by the firm is not fully eliminated by hedging strategies. Thus, a cross-sectional analysis is necessary to understand why individual firms display varying sensitivity to exchange risk. Cross-sectional differences in exchange exposure depend not only on firm-specific variables but also the characteristics of industry to which each firm belongs.

Firm specific factors include the level of a firm's international operations and a firm's operating characteristics which influence its potential reaction to exchange rate changes. Industry characteristics include the export and import ratios.

2.3. Firm-Specific Factors

A.1. Degree of foreign involvement

Recent studies on the degree of foreign involvement in [9, 13, 14, 16, 17] as well as The study [18] demonstrate that a firm's exchange rate exposure is significantly related to the level of its foreign involvement. As the degree of foreign involvement is increased, the exposure should increase and a positive relationship suggests that firms with high foreign involvement are more sensitive to exchange rate changes. This degree of foreign involvement is measured as the degree of foreign operation. It is hypothesized that the degree of foreign operation is positively related to the level of exposure. A proxy for the degree of foreign operation is measured as the ratio of Foreign Sales to Total Sales (FSALE).

A.2. The Incentives for reducing exposure

i) Bankruptcy Costs

The study [19, 20] also argue that hedging decreases the probability that a firm will go bankrupt and thus mitigates the expected costs of financial distress by reducing the variability of the future value of the firm. A firm's Long-term Debt Ratio (LTDEBT) is used as proxy for its pre-hedging measure of financial distress. Hence, it is proposed that firms with greater financial leverage are more exposed to economic exposure and exchange-rate risk. A firm's Long-term Debt Ratio (LTDEBT) is measured as the ratio of year-end book value of long-term debt to the market value of equity.

ii) Underinvestment Problems

Underinvestment problems, also known as debt-overhang problem, have to do with agency relationship between shareholders and debtholders following the hypothesis that, managers act in the shareholder's interest; else between new and old shareholders, managers will act in the interest of the old ones [21, 22]. This followed the empirical study in which The study [23] characterizes firms' potential investment opportunities as options and demonstrates that, with fixed claims in the firm's capital structure, taking a positive net present value project can reduce shareholders' wealth if the gains accrue primarily to the debtholders. Consequently, the shareholders may have incentives to forego positive NPV projects. The study [24] argues that without hedging, firms are more likely to pursue suboptimal investment projects. Hedging reduces this underinvestment problem by reducing not only the costs of obtaining external funds, but also a firm's dependence on external financing. The benefits of hedging thus increase with a rise in potential underinvestment costs. Hence, it is proposed that firms with more investment opportunities are more likely to use hedge and thus, are less exposed to exchange-rate risk. The investment opportunities are proxied both by the firm's Research and Development expenditures scaled by its sales (R&D) and the Book Value of a firm's common equity scaled by its Market Value (BM).

iii) Short-Term Liquidity

According to the study [25], short-term liquidity is intended to provide information about a firms' solvency or liquidity over the short-run; looking at its ability to meet short-term requirement for payments of obligations without undue stress. It focuses on current assets and current liabilities, ensuring that a borrowing firm is able to meet its short-term obligations. The study [27] argues that firms can mitigate the expected financial distress and agency costs associated with long-term debt by maintaining greater short-term liquidity. Two variables are used as proxies for a firm's short-term liquidity; and these are the Quick Ratio (QUICK) and the Dividend Yield (DIV). The quick ratio measures a firm's ability to repay short-term operating liabilities with readily available cash. The greater a firm's quick ratio and the lower its dividend payout ratio, the greater its need not to hedge to reduce the expected financial distress and agency costs of straight debt, and hence the lower its exposure.

iv) Economies of scale in costs of hedging

Economies of scale occur when firms cost decreases as a result of large masses of production efficiencies. According to [26], this can be due to a variety of changes such as reduction in cost of goods used, new capital infrastructure investments, or improvements on business-specific level. Related macroeconomic variables outside the control of the company can cause improvements in economies of scale. These variables are managed through corporate hedging strategies to reduce risk of higher costs. They argued that, globalization is a key variable in economies of scale which allows large business to realize greater economies of scale by pursuing cheaper resources around the world, more efficient cost structure, and combined resources of the entire globe. This study argues that, MNCs can obtain cheaper capital, sell in lower tax economies, and generate large profits from the economies around the globe but will face the risks of foreign exchange rate dynamics which require careful strategies to mitigate them. The study [27] observe that the off-balance sheet instruments exhibit significant scale economies in the structure of transaction costs and thus, large firms are more likely to hedge with these instruments. The study [28] argue that costs associated with implementing and maintaining a risk management program, including those related to the acquisition of expertise, exhibit economies of scale related to the amount of risk managed. It is hypothesized that multinational firms with economies of scale of hedging are more likely to use hedging instruments, and then those firms are less likely to be exposed to foreign exchange exposure. Therefore, firm size is negatively related to the level of exposure since large firms are more likely to hedge. Firm Size (SIZE) is computed as the natural log of the market value of its equity.

v) Substitute for Derivatives Hedging

Foreign currency derivative is a financial derivative whose payoff depends on the foreign exchange rates of two (or more) currencies. These instruments are commonly used for hedging foreign exchange risk or for currency speculation and arbitrage. Specific foreign exchange derivatives include: foreign currency forward contracts, foreign currency futures, foreign currency swaps, currency options, and foreign exchange binary options. These instruments are called derivatives because their value is

derived from an underlying asset, a foreign currency. Hedging involves financial transaction that reduces or fully eliminates the risk associated with another transaction; but derivative instruments are financial contracts whose value depends on another financial asset. Hedging risky transactions involving foreign exchange can help avoid heavy losses in financial markets. Currency derivatives hedging can be substituted to reduce risks associated with cost of long-term finance. Multinational Companies purchase financial derivatives in order to reduce the risk associated with cash flows denominated in foreign currency and as a result hedge the exchange rate risk on the expected profit, speculation, or arbitrage.

In their study of the determinants of the use of currency derivatives by US firms, [28] find on the one hand that foreign debt and currency derivatives may act as substitutes for hedging foreign operations and on the other hand currency derivatives use is positively associated with the use of foreign debt. Another study that also found a positive relationship in multi-country tests is [29]. Both studies conclude that the implication of this is that foreign currency debt is a source of foreign currency exposure, which requires hedging via the use of foreign currency derivatives. This will be the case if foreign debt is issued in a currency in which assets are not held and so creates an exposure, in which case a currency swap could be used to translate the debt into the appropriate currency for matching purposes. However, a positive correlation between currency derivative use and foreign debt might be observed if both are used for hedging but hedge different sources of exposure to exchange rate risk. For example, forwards, futures and options might be used to hedge short-term transaction exposures, whereas long-term foreign currency borrowing might hedge the assets in a foreign operation when the commitment to the investment is of a long-term nature. Data for 94 US firms were collected by [30] from the notes in annual reports to compare the use of foreign currency derivatives and foreign debt. They did not find any significant evidence that firms with revenues from operations abroad prefer to use foreign currency derivatives or foreign debt to hedge currency exposure from foreign operations. This result implies that currency derivatives and foreign debt might be seen as alternatives for hedging currency exposure from foreign operations. Although, they find significant evidence that exporters prefer the use of foreign currency derivatives to the use of foreign currency debt. The study conducted by [28] and [30] on firms with foreign operations find foreign currency debt and currency derivatives equally viable for hedging and this exposure requires further scrutiny. This is because, as suggested above, not all currency derivatives can effectively substitute for foreign debt when hedging foreign operations. The exposure arising from foreign operations is usually long term in nature and therefore might be more effectively hedged using an instrument with a similar maturity, such as long term foreign debt or a currency swap, since this reduces basic risk. Foreign currency forwards, futures or options might not be appropriate in these circumstances because of their shorter maturities. Both studies provide no indication of the derivative type composition of their sample of currency derivative users. For example, if the derivative user sample is composed of currency swap users and firms that use other currency derivatives, then the result that currency derivatives and foreign debt may act as substitutes might be driven by the inclusion of currency swap users in the derivative user sample. If this is the case, a sample of currency derivative users that excludes currency swap users might not produce the same result.

In a related study, [27] argued that firms can reduce the agency and expected financial distress costs associated with long-term financing not only by hedging, but also by issuing Convertible Debt or Preferred Stock (PFSTK), Because convertible debt and preferred stock are possible substitutes for hedging, it is therefore proposed that there might be a negative association between the use of PFSTK and exchange exposure.

B. Industry factors

In this section, the study explores the possibility that exchange risk exposure might also be industry-specific. The study [31] examined the relationship between exchange rate exposure and firm-specific factors; firm size, maturity, level of international activity as a measure of natural-hedging, using panel data approach. Their results show that the size of the firm and the level of international activity are significant in lowering the exposure and that, firms that can be characterized as net-exporters or net-importers are more likely to have significant exposure to exchange rate movements. However, [32] as well as the study of [33] argue that exchange rate movements affect some industries differently than others because some are more export or import dependent than others. For example, a depreciation of the domestic currency improves or worsens the terms of competition for export or import intensive industries since fewer foreign currency or more domestic currency units are required to purchase the exported or imported goods and services. On the other hand, UK firms that compete with imports will benefit from a depreciation, which makes their products price competitive in home currency terms. Therefore, export and import ratios at the industry level are employed as surrogates for industry characteristics. The export ratio is measured as industry export over total domestic production and the import ratio, industry import divided by the sum of industry export and import.

3. Methodology

3.1. Data

The data on regional foreign operations of various MNCs listed on the FTSE350 in UK are obtained from the accounting footnotes of financial statements from FAME and the DataStream on Compustat Geographical Segment Database. FTSE350 Index is a capitalization-weighted index which is the 350th largest company listed on the London Stock Exchange. It combines FTSE100 and 250 (FTSE

SmallCap Index and FTSE All-Share Index). The FTSE products are used worldwide by market participants for investment analysis, performance measurement, assets allocation and hedging. It is managed by the subsidiary of the London Stock Exchange Group [34].

Data about trade weights within the region, updated annually, are obtained by the International Monetary Fund's (IMF) *Direction of Trade Statistics Yearbook.* In order to be included within each region, an individual country's total trade (exports plus imports) should be greater than or equal to 5% of regional total trade. This approach avoids not only the problem of multicollinearity that using separate but positively correlated bilateral exchange rates would introduce, but also the large measurement errors caused by using a broad index if many of the firms in the sample are not exposed to this particular combination of currencies.

3.2. Model

The purpose of this section is to explore the cross-sectional differences of exchange exposure across Multinational Corporations (MNCs) listed on FTSE350 in the UK. The cross-sectional model used to test the explanatory capabilities of the variables is as follows.

$$|b_{1i}| = \beta_0 + \beta_1 FSALE_i + \beta_2 SIZE_i + \beta_3 QUICK_i + \beta_4 DIV_i + \beta_5 R\&D_i + \beta_6 LTDEBT_i + \beta_7 PFSTK_i + \beta_2 TRADE_i + \mu_i \ i = 1,\ldots, N \ (2)$$

The regression coefficients are estimated using OLS. The dependent variable is an absolute value of the estimated exposure, $|b_{1i}|$, from the regional sales-based Index model, $R_i t = \alpha_o t + \alpha_i t \ TRWX t + \alpha_{2i} R_m t + \varepsilon_i t$ 'for MNC i over 1993-2013. The independent variables are all measured over 1993-2013. The proposed variables are, Foreign Sales to Total Sales (FSALE), Natural log of the Market Value of its Equity (SIZE), Quick Ratio (QUICK), Dividend Yield (DIV), Research and Development (R&D) Expenditures to Total Sales (R&D), and Firm's Long-term Debt to its Market Value of Equity (LTDEBT), Book Value of Preferred Stock to Market Value of Equity (PFSTK), and a sum of Industry Export and Import Ratios (TRADE).

The inter-temporal stability of the test results is examined by dividing the entire sample period into two sub-periods, 1993-2003 and 2004-2013. Given that the absolute value of exchange rate exposure is used as the dependent variable, both the import and export ratios are expected to be positively related with the absolute value of exchange rate exposure. Thus the sum of export and import ratios (TRADE) is used as a surrogate for industry export or import share for each firm. This has been explained in the section 4 of this paper; where table 1 illustrates the independent variables we used.

4. Empirical Results

Firm-specific factors include:
1) The level of a firm's international operations and
2) A firm's operating characteristics which is a surrogate for a firm's hedging motives.

The sum of industry export and import ratios is used as the industry factor. Estimates of the exchange-rate exposure of the firms in the sample using regional sales-based exchange rate index are not reported. Table 1 provides descriptive statistics of the determinants of exchange rate exposure.

Table 1. *Summary of Financial Characteristics of Determinants of Exchange Rate Exposures.*

Variables	N	Mean	Median	Std Dev
Ratio of foreign sales to total sales (FSALE)	121	0.376	0.3515	0.170
Book value of long-term debt /market value of equity (LTDEBT)	121	0.290	0.175	0.379
R & D expenditures/ sales (R&D)	121	0.039	0.025	0.042
Book to market ratio (BM)		0.457	0.429	0.204
Quick ratio (QUICK)	121	1.099	0.947	0.626
Dividend yield (DIV)	121	2.262	2.269	1.495
Natural log of market value of equity (SIZE)	121	8.438	8.222	1.124
Book value of preferred stock/ market value of equity (PFSTK)	121	0.017	0	0.089
Share of industry trade (TRADE)	121	0.657	0.6833	0.250

Table 2 presents OLS regression estimates of the determinants of exchange rate exposure during the period 1993-2013 and two sub-periods, 1993-2003 and 2004-2013.

The coefficients of FSALE, SIZE, and QUICK have a strong combined explanatory power for exposure and are statistically significant regardless of the model specification. Consistent with [8] study, the degree of a firm's foreign operation (FSALE) has a significant positive correlation with its foreign exchange rate exposure. Thus, the higher a UK Multinational's level of foreign sales, the larger its exchange rate exposure. A significant negative association between exposure and SIZE indicates that small firms are likely to have foreign exchange exposure. From our earlier analysis, firms with high degrees of expected financial distress are posited to have significant levels of foreign exchange exposure. The estimated coefficient of QUICK is positive and statistically significant while the coefficient of DIV is negative and not significant. The coefficients on R&D, BM, and LTDEBT are not statistically significant and the signs of R&D, LTDEBT, and PSTK are not consistent with optimal hedging theories as stated in [The study 35, 36].

The sign for expected financial distress, LTDEBT, changes from negative in the first sub-period to positive in the second sub-period. The sign is positive for the full sample period. The sign for growth opportunities, R&D, changes over the three sample periods as well. These results might indicate that agency and expected financial distress costs may not have a direct bearing on a firm's foreign exchange-rate exposures.

The sign for preferred stock, PSTK, changes from significantly positive in the first sub-period (Panel B) to negative in the second sub-period (Panel C). The coefficient is positive but not significant for the full sample period (Panel A). Overall, our study shows that there was significant exchange rate exposure for UK Multinationals, during the period we analyzed. That exposure is robust to the choice of model specification.

Table 2. *OLS Regression Estimates of the Determinants of Exchange Rate Exposures.*

Panel A: Regression Estimates (1993:01-2013:12)

Variables	Model 1	Model 2	Model 3	Model 4	Model 5
Intercept	0.8687*** (4.57)	0.5547** (2.55)	0.5481** (2.52)	0.6605*** (2.87)	0.4221 (1.64)
FSALE	0.4410*** (2.94)	0.4094*** (2.71)	0.3914*** (2.61)	0.4599*** (3.03)	0.5578*** (3.25)
SIZE	-0.0763*** (-3.37)	-0.0502** (-2.10)	-0.0551** (-2.35)	-0.0543** (-2.21)	-0.0472* (-1.75)
QUICK	-	0.1122** (2.41)	0.1221*** (2.70)	-	0.1073** (1.98)
DIV	-	-0.0189 (-0.94)	-	-0.0357* (-1.89)	-0.02274 (-0.92)
R&D	-	-0.2782 (-0.41)	-0.1051 (-0.61)	-	0.0327 (0.04)
BM	-	-	-	0.1717 (1.14)	-
LTDEBT	-	0.0950 (1.21)	0.0730 (0.97)	0.0677 (0.62)	0.1222 (1.11)
PSTK	-	0.4887 (1.65)	0.4862 (1.64)	0.8133 (0.60)	0.8677 (0.65)
TRADE	-	-	-	-	0.0415 (0.34)
F statistic	8.35***	4.30***	4.88***	4.16***	3.68***
R^2	0.141	0.174	0.169	0.148	0.199

Notes: ***, **, * represents significance at the 1%, 5%, and 10% levels, respectively. Numbers in parentheses are t values

Panel B: Regression Estimates (1993:01-2003:12)

Variables	Model 1	Model 2	Model 3	Model 4	Model 5
Intercept	0.7566*** (4.16)	0.7456*** (3.86)	0.6960*** (3.19)	0.1442 (0.48)	0.6796*** (2.90)
FSALE	0.3749** (2.44)	0.3139** (2.03)	0.3535*** (2.28)	0.3425** (2.20)	0.5158*** (2.96)
SIZE	-0.0639*** (-2.85)	-0.0622** (-2.5)	-0.0539*** (-2.08)	-0.0195 (-0.68)	-0.0624** (-2.24)
QUICK	-	-	-	0.1117*** (2.81)	-
DIV	-	-0.0015 (-0.07)	-0.0182 (-0.83)	-	-0.0136 (-0.51)
R&D	-	0.9700 (1.4)	-	-	0.5117 (0.60)
BM	-	-	0.1007 (0.85)	0.1208 (0.97)	-
LTDEBT	-	-0.0810 (-1.22)	-0.1080 (-1.57)	-0.0116 (-0.12)	-0.0877 (-0.94)
PSTK	-	0.6073** (2.03)	0.6148*** (2.03)	0.5138 (1.64)	1.112 (1.07))
TRADE	-	-	-	-	0.0534 (0.37)
R^2	0.079	0.131	0.124	0.153	0.154

Notes: ***, **, * represents significance at the 1%, 5%, and 10% levels, respectively. Numbers in parentheses are t values

Panel C: Regression Estimates (2004:01-2013:12)

Variables	Model 1	Model 2	Model 3	Model 4	Model 5
Intercept	1.3196*** (4.43)	1.2545*** (4.01)	0.9466*** (2.83)	0.8363**	0.9815*** (2.75)
FSALE	0.1915 (0.82)	0.2363 (0.97)	0.2067 (0.86)	0.2754 (1.15)	0.2673 (0.99)
SIZE	-0.0949*** (-2.71)	-0.0885** (-2.43)	-0.0782** (-2.19)	-0.0593 (-1.52)	-0.0758* (-1.92)
QUICK	-	-	0.1677** (2.38)	-	
DIV	-	-0.0210 (-0.07)	-	-0.0252 (-0.87)	-0.0346 (-1.35)
R&D	-	0.3503 (0.38)	0.3100 (0.35)	-	-0.2756 (-0.24)
BM	-	-	-	0.5366 (1.92)	-
LTDEBT	-	0.1296 (0.83)	0.1808 (1.25)	0.0103 (0.07)	0.0630 (0.33)
PSTK	-	-0.2740 (-0.57)	-0.2790 (-0.55)	-0.0393 (-0.08)	0.8730 (0.48)
TRADE	-	-	-	-	0.2984* (1.68)
R^2	0.047	0.056	0.089	0.078	0.102

Notes: ***, **, * represents significance at the 1%, 5%, and 10% levels, respectively. Numbers in parentheses are t values

5. Conclusion

This paper investigates the relation between changes in exchange rates and changes in firm value, and explores the determinants of differential exchange-rate exposure across UK multinational corporations. The study finds that 20% of the sampled firms have statistically significant exposure (at the 5% level of significance). Regression estimates of the determinants of exchange rate exposure suggest that FSALE (the level of a firm's foreign sales), SIZE (natural log of market value of its equity), and QUICK (the quick ratio) have a strong combined explanatory power for exposure.

The cross-sectional differences in the degree of exchange exposure are negatively related to firm size and positively related to the degree of a firm's foreign operation. Thus, the higher a UK Multinational's level of foreign sales, the larger its exchange rate exposure. A significant negative association between exposure and SIZE indicates that the degree to which a firm is exposed is negatively related to its size. A significant positive sign on the QUICK variable indicates that the greater a firm's quick ratio, the lower its incentive to hedge and the lower its exposure. The coefficients on the DIV, R&D, BM, R&D and LTDEBT are not statistically significant. This indicates that these factors play no explanatory role in determining foreign exchange rate exposure.

Multinational corporations, having identified their level foreign exchange exposure can alleviate the risk of economic exposure, which is not readily apparent to investors through operational strategies or currency risk mitigation strategies. For operational strategies, companies can diversify production facilities and markets for products; explore flexible sources for key inputs for the opportunity to avoid expensive inputs from a singular source; diversify financing sources where, access to capital markets in several major jurisdictions allows a multinational company the flexibility to raise cheaper capital from the market with the cheapest cost of funds. With currency mitigation strategies, MNCs can match foreign currency inflows and outflows, enter into currency risk-sharing agreements, arrange for back-to-back loans or credit swap and undertake currency swaps.

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