# Foreign Currency Exposure and Hedging: Evidence from Foreign Acquisitions

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## Abstract

While theoretical research suggests that many firms should have significant exchange rate exposure, empirical research has documented a low stock price reaction to exchange rate movements. In this paper we investigate the SEC filings of a sample of firms for which currency risk is important and we use these data to determine the extent to which hedging activity masks the relationship between firm value and exchange rates. Our sample consists of U.S. firms that have acquired foreign companies and thus have underlying exposure to at least one bilateral exchange rate. As with many previous studies, their stock returns are not strongly affected by exchange rate movements. We find that this result does not owe to the use of financial derivatives. In contrast, the evidence shows some support for a role for operational hedging in the currency exposure puzzle.

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## Abstract

While theoretical research suggests that many firms should have significant exchange rate exposure, empirical research has documented a low stock price reaction to exchange rate movements. In this paper we investigate the SEC filings of a sample of firms for which currency risk is important and we use these data to determine the extent to which hedging activity masks the relationship between firm value and exchange rates. Our sample consists of U.S. firms that have acquired foreign companies and thus have underlying exposure to at least one bilateral exchange rate. As with many previous studies, their stock returns are not strongly affected by exchange rate movements. We find that this result does not owe to the use of financial derivatives. In contrast, the evidence shows some support for a role for operational hedging in the currency exposure puzzle.

## 1. Introduction

A large literature has puzzled over the fact that exchange rates do not seem to affect firm value much (Jorion, 1990; Bodnar and Gentry, 1993; Amihud, 1994; Khoo, 1994; Choi and Prasad, 1995; Bartov, Bodnar and Kaul, 1996; Allayannis, 1997; He and Ng, 1998; Miller and Reuer, 1998; Glaum, Brunner and Himmel, 2000; Dominguez and Tesar, 2001; Griffin and Stulz, 2001; Bartram, 2004; Doidge, Griffin and Williamson, 2006; Bartram and Karolyi, 2006).[1] Several factors might account for these findings, including the possibility that firms with large underlying exposures hedge away the currency risk. Derivatives seem especially likely to explain the puzzle since they are more often used by large firms and bigger firms are expected to have greater foreign exposures (Dominguez and Tesar, 2006; Allayannis and Ofek, 2001; Brown, 2001).

A test of the impact of derivatives on the relationship between exchange rates and profitability requires firm-specific information on foreign exchange futures, forwards, swaps and options. While U.S. publicly traded firms report these data to the Securities and Exchange Commission (SEC), the extent of the information is limited and the notional values, when reported, must be collected by hand. Likewise, individual firm data on operational hedging is not readily available. Consequently, we have yet to confirm or refute the hypothesis in Dominguez and Tesar (2006) that the empirical findings on currency exposures and profits owe to firms dynamically adjusting their behavior in response to exchange rate risk.

In this paper we investigate the SEC filings of a sample of firms for which the underlying currency risk is likely to be high and we use these data to determine the extent to which hedging activity masks the relationship between firm value and exchange rates. We hand collect information on financial derivatives positions and operational hedging for 102 U.S. firms that completed

[1] See Bartram and Bodnar (2007) for a review of the literature.

relatively large acquisition of foreign firms. Since the acquisitions are at least 5% of the value of the pre-deal firm, these mergers should have a substantial impact on the currency risk of the acquiring firm. We consider the exchange rate exposures of the firms' stock returns prior to the deal and how they change after the mergers; we investigate the acquirer's use of derivatives before and after the deal to see if hedging with financial instruments reduces estimated exposures; and we examine differences in stock return coefficients between firms that commence business in the target country via the acquisition and those for which the merger serves as an operational hedge.

In many cases the acquiring company either begins production abroad in a country where it already has substantial sales, thus moving its costs into the same currency that it receives revenues, or it acquires more production facilities at the same time that it expands sales, thus restricting its new exposure to foreign profits. These operational hedges tend to reduce the estimated exposures in stock return regressions. In contrast, the SEC filings reveal that only a fraction of the acquiring firms use currency derivatives to hedge movements in the exchange rates of the target firm's country. Moreover, we find no evidence that these derivatives reduce the estimated impact of currency movements on stock returns. Our results indicate that firms dynamically respond to changes in exchange rate risk by way of adjustments to operations and only occasionally via financial derivatives. Thus, to the extent that the currency exposure puzzle reflects the effects of hedging strategies, our evidence suggests that financial instruments do not mask the true underlying exposures as much as operational hedges.

The remainder of this paper is as follows: Section 2 describes the analytical framework for testing the impact of financial and operational hedging on stock returns. Section 3 describes the data. Section 4 summarizes how the deals affect the foreign operations of the acquirers and

describes their use of financial derivatives. Section 5 presents the results on stock return exposures and relates them to the use of hedging strategies. Section 6 concludes.

## 2. Analytical framework

Following Adler and Dumas (1984), we estimate the effect of foreign exchange rates on firm value by augmenting time-series regressions of the CAPM model. Specifically, our basic regression model is:

$$R_{jt} = \alpha_j + \beta_j R_{Mt} + \delta_j R_{FXt} + \varepsilon_{jt} \tag{1}$$

where $R_{jt}$ is an individual firm's stock return over period $t$, $\alpha_j$ is a constant, $R_{Mt}$ is the return on the market index (measured by the CRSP valued weighted index), and $R_{FXt}$ is the percentage change in the foreign exchange rate. The exchange rate is defined in U.S. dollars per unit of foreign currency so that the estimate of the foreign exchange rate exposure, $\delta_j$, is positive for net exporters and negative for net importers.

In order to compare the results to those in the existing literature, the analysis in this paper begins by estimating Equation (1) for the sample of U.S. acquirers of foreign targets using a trade-weighted, multilateral exchange rate. Next the multilateral exchange rate is replaced with the bilateral exchange rate of the target country since this currency should be most relevant in the context of the foreign acquisition. The regressions are estimated using weekly data over a four year period centered on the acquisition date. While estimates with monthly data are also presented for comparison to previous studies, we prefer weekly data because it allows us to limit the length of each firm's estimation period to a time when exposure is known without inducing small sample problems.[2]

[2] Several papers highlight the sensitivity of the estimated exposure to the horizon (e.g., Bodnar and Wong, 2003; Chow, Lee and Solt, 1997a, 1997b; Griffin and Stulz, 2001), and Dominguez and Tesar (2003) in particular show

If the typical acquisition of a foreign target is a means of entry into a new market, the exchange rate should matter only after the acquisition.[3] Specifically, a U.S. firm that never had any sales to a foreign country, but subsequently acquired a firm in that country, should have an insignificant estimate of $\delta_j$ in Equation (1) if the only data analyzed are from the pre-acquisition period. In this case, exchange rate movements would only be significant in the firm's stock return regression in the period after the acquisition, suggesting the following specification:

$$R_{jt} = \alpha_j + \beta_j R_{Mt} + \delta_j R_{FXt} + \beta_{ja}\lambda R_{Mt} + \delta_{ja}\lambda R_{FXt} + \varepsilon_{jt,} \tag{2}$$

where $\lambda$ is an indicator variable for post-deal observations and $\delta_{ja}$ captures the exposure created by the acquisition. Because the sample contains only deals where the target is large relative to the market capitalization of the acquiring firm, $\beta_j$ may also change after the deal if the combined entity's market risk differs from that of the pre-deal acquirer. Therefore, Equation (2) also allows for a different post-deal exposure to the market portfolio (beta).

Some firms may already have a presence in the target country and, therefore, have significant exposure to the target's currency before the deal. Then, if a U.S. acquirer is already exporting to the target's country, the deal may serve as an operational hedge (see Pantzalis, Simkins and Laux, 2001; Williamson, 2001; and Bartram, Brown and Minton, 2010). For example, if a U.S. firm is a net exporter prior to the acquisition ($\delta_j$ in Equation (2) is positive), and the acquisition provides the firm with production facilities in the target country, its costs as well as its revenues will be sensitive to the exchange rate in the later period. Because one is offsetting the other, the overall exposure falls in the second period, which would show up in Equation (2) as a positive $\delta_j$ and a negative $\delta_{jz}$. Thus, if operational hedges reduce the impact of exchange rate risk on

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that monthly returns result in slightly higher coefficients. This suggests that our use of weekly returns may slightly understate the extent to which currency movements matter.

[3] In unreported results, currency exposures are estimated using the announcement date instead of the completion date and find qualitatively similar, albeit somewhat weaker, results.

firms' stock returns, both $\delta_j$ and $\delta_{ja}$ could be significantly different from zero and have opposite signs.

Regardless of the underlying exposure in each period, the estimates of currency exposure in Equations (1)-(3) will be zero if the firm uses financial derivatives to hedge the currency risk. We examine this possible outcome with data from the SEC filings. Previous studies on corporate hedging find that smaller firms use derivatives less often, likely due to the high cost (Starks and Wei, 2004). We can determine to some extent if firms have access to derivatives markets by checking their use of other derivatives. If firms wish to hedge currency risk but cannot do so because of lack of access to the market, they would not have contracts involving interest rate risk or energy derivatives.

## 3. Data

The sample consists of all publicly traded U.S. firms that acquired foreign firms during the period 1996-2004 as reported by Securities Data Corporation (SDC). SDC data include details on mergers and acquisitions, such as the amount and nature of compensation paid to the target. We include acquisitions that lead to control of the target (more than 50% of the shares outstanding) and that have an SDC deal value of at least 5% of the market capitalization of the acquirer (as reported on CRSP).[4] Further, we require that the target stock price be available, either on DataStream or Bloomberg. There are 120 acquisitions that meet these criteria. We delete one deal from the sample because the target firm's only asset is equity in the acquirer and another five because there are no SEC filings for the acquirer during the relevant time period. Three more deals are excluded where the target country currency is pegged to the U.S. dollar, yielding a final sample of 102 transactions.

[4] The average fraction of the target acquired in the deal is 98% and the median 100%.

We hand collect data on derivatives usage from SEC filings (typically 10-K reports) around the time of the acquisition. The information content of these reports changes during our sample period because accounting rules change over time. In particular, SFAS 133 led to increased disclosure starting in 1998. Nonetheless, the extent of the disclosure remains fairly limited in that many companies do not report the notional values of their currency derivatives, and instead report only the fair value. Since most derivative positions have zero value at origination by design, these firms' data merely indicate whether the firms use such derivatives, not the quantity used. Hence, our analysis of the effect of hedging on stock returns is based on an indicator variable that is set to one if the firm uses currency derivatives, and zero otherwise. We create two such variables, one for derivatives usage in the year before the deal and one based on hedging activity in the year after the acquisition.

We also collect data on foreign operations of the acquirer from the SEC reports. Some companies provide detailed annual data on sales by country, while others only list sales by region or continent. In the latter case, we use the lists of subsidiaries and the locations of their properties to determine whether the deal represents new entry into the country. The foreign exposures of the target firms are also collected by hand, usually from reports to the SEC of the acquiring U.S. firm. In some cases, we obtain the information from the target's annual reports or regulatory reports.

Weekly stock returns for the acquirers are calculated from CRSP stock prices. Our estimates of the CAPM are based on two years of weekly data on each side of the acquisition week, but some firms delist from CRSP after the deal and a few have not traded for as long as two years before the acquisition so not all firms have 104 weekly observations. However, all the firms have stock prices recorded on CRSP for at least 45 weeks prior to and after the deal. Accounting data for the sample firms are from Compustat.

Table 1 presents summary statistics for the 102 deals. They occur more often in the late 1990s (Panel A), when the value of the stock market was relatively high and firms could more easily pay for acquisitions with stock (Panel B). Slightly more than two fifths of the deals involve some equity. Canada and the U.K. dominate the list of target countries, with each representing about a third of the sample (Panel C).[5] Most of the target companies are in the same industry as their acquirers and these tend towards software or manufacturing (Panel D). By construction, the target companies are large relative to the acquiring firm. In practice, this limits the typical size of the U.S. firm since few very large foreign companies would likely be targets and still be at least 5% of the market capitalization of the acquirer. The acquirers, however, are not typically small, although a few are start-ups with no revenues (Panel B). About three-quarters are established enough to have trading relationships with more than one country prior to the deal, as seen in Panel E. These multinational companies also tend to be the larger firms in the sample, as seen by the median value of their market values.

## 4. Firms' Behavior in Response to Currency Risk Changes

Table 2 presents evidence on foreign operations and derivatives usage before and after the completion of the deal. Most U.S. firms have sales in the target country before buying their target companies, and nearly all of these firms also have production facilities in the targets' countries. Consequently, we create one indicator variable for whether the firm has any business ties to the target country prior to the acquisition. The very large fraction of firms with operations in the target country in the pre-deal period indicates that the acquisitions often serve as a natural hedge for these companies. We also find that the target companies frequently have overseas operations and are likely to export their products. Most target firms export to the U.S., which may mean that the

[5] In unreported tests we find that results are similar when we exclude firms in these two countries.

currency exposures to the target country would not be very high even if there were no operational hedges.[6] Considering the substantial information problems expected in cross-border mergers, it is not surprising that the deals in our sample frequently involve target firms that have already overcome some of the language and cultural hurdles of foreign operations.

While hedging with operations is common in our data, hedging the new exposure to the target country's currency with financial derivatives is not. Although Table 1 shows that three quarters of our acquiring firms are multinationals before the deal, few of them use currency derivatives before the deal. We note that SEC filings do not always specify the currency of the derivative contract and thus we might classify firms as not using currency derivatives tied to the target's exchange rate when in fact it does. Nonetheless, we find that while 71% of the firms have a reason to hedge with derivatives tied to the exchange rate of the target country before the deal, only 39% use any currency derivative in that period, and most involve a different currency. Less than 15% of the firms use forwards, swaps or options in the target's currency prior to the acquisition. That fraction increases after the deal is completed, although only to about one third.[7] Moreover, when these currency derivatives are deployed, they often involve small notional amounts. For the firms that have derivatives in the target's currency and report notional values, the average notional value is only about a quarter of the size of the deal value. Given that the acquisition is less than a third of the market capitalization of the acquirer, these data imply that when firms use currency derivatives in the target's currency, they only hedge a small portion of the value of the firm.

[6] In unreported results, we find that the stock returns of the target firms before the deal rarely exhibit a significant exposure to exchange rates.

[7] The post-merger use of currency derivatives in the target country is below 43% (the sum of the percentage that use forwards, swaps and options) because some firms use more than one type of hedging instrument.

The relatively infrequent use of currency derivatives tied to the target currency does not owe to a lack of access to derivatives markets, as most of the U.S. firms use some kind of derivative contract. In the year before the deal takes place, nearly half of the acquiring firms use interest rate swaps or other derivatives that are not based on currency movements. After the merger, when the firms are even larger, this fraction rises to one half. Further, most firms use currency derivatives in the post-deal period. Given that the majority of the acquisitions involve firms in Canada, Europe and Australia, it is unlikely that the acquirers use non-target country currency derivatives because the target currency market is undeveloped or illiquid.

We further consider why acquirers use currency derivatives with logit regressions. Estimates on the left side of the Table 3 (models (1) through (4)) show the impact of factors that affect the use of derivatives in the target country currency after the deal is completed. Because some derivatives tied to the target country currencies are not identified as such in SEC filings, we also present logit regressions where the dependent variable is one whenever a firm uses any currency derivative (the right side of Table 3, models (5) through (8)).

The results on the use of currency derivatives are largely consistent with the previous literature in that large firms are more likely to use these instruments than smaller firms (Géczy, Minton, and Schrand, 1997; Guay and Kothari, 2003; Allayannis and Ofek (2001); and Bartram, Brown and Minton, 2010). Thus, a fraction our firms likely do not use derivatives because they are too small to access these markets (Starks and Wei, 2004). Firms can also hedge by issuing debt denominated in the target country currency (Graham and Harvey, 2001). The results in Table 3 show that firms that use debt denominated in a foreign currency are also more likely to use currency derivatives, again suggesting that size and access to capital markets is a factor in derivatives use. However, the variable is only significant when the dependent variable is based on

the target country currency. Likewise, we find limited evidence from the use of interest rate swaps that access to derivatives markets in general is a factor. Table 3 also shows that larger acquisitions are more likely to involve financial instrument hedging, as the relative deal value variable is positive in all specifications, although it is not always significant.[8] If financial instruments were substitutes for operational hedging, the coefficient on the indicator variable for acquirers that sell in the target country would be negative. Although the sign is correct, the variable is never significant. This result may owe to the fact that firms with a presence in the country prior to the deal are more likely to be multinationals, and these firms are also large (Table 1, Panel E).

## 5. Firm Value and Currency Exposure

Next we consider the relationship between exchange rate movements and stock returns in our sample. While most studies of currency exposures use a trade-weighted basket of currencies as the relevant exchange rate, many of the firms in our sample only have exposure to the target's currency and all of them have greater exposure to such bilateral exchange rates as a result of the deal, absent other effects. Thus, we present estimates of the time series estimations of currency exposures from Equation (1) using both a multilateral exchange rate and bilateral exchange rates.

Table 4, Panel A shows that only 10.8% of our firms have significant positive estimates for $\delta_j$ when a trade-weighted currency basket is used to estimate currency exposures, and another 2.0% have significant negative exposure coefficients (at the 5% significance level). Thus, the total fraction of firms with significant time-series coefficients is 12.8%, which is similar to results in previous studies. Panel B shows that replacing a general currency index with the specific bilateral exchange rate for the country of the acquisition target scarcely matters. The table also

[8] While more volatile currencies entail a larger increase in the volatility of the acquirer's cash flows, unreported results do not show a significant impact of the volatility of the target currency on the propensity of acquiring firms to use derivatives.

shows that results based on weekly data are similar to those using monthly data. In the interest of brevity, we use only weekly data for the remainder of the analysis. Thus, as with previous studies, the currency exposure puzzle exists in our sample.

Note that when coefficients are significant in the time series regressions, they are more often positive than negative, implying that the sample has more net exporters than net importers. This imbalance allows us to test whether the average coefficient of the time-series regressions is significant in the cross-section.[9] Table 4 shows that the average coefficients for both currency measures are significantly different from zero regardless of the time horizon used. This suggests that firm value is affected by exchange rates, albeit to a limited extent.

Since Tables 1-3 indicate that our sample exhibits wide variation in the use of derivatives, a possible explanation for the weak relationship between currency risk and stock returns in Table 4 is that some of the firms hedge away the exposure with derivatives. Table 5 investigates the effect of hedging with financial derivatives on the currency exposures by comparing the coefficients of the firms that hedge to those that do not. The results do not provide any evidence that derivatives use masks the true underlying exposures to currency risk. In fact, significant coefficients occur more often among the hedgers than the firms that do not use derivatives. For example, when we investigate derivatives tied to the target country currency, the fraction of significant positive exposures in the time series regressions is 17%, compared to only 6.5% for the firms that do not use such financial hedges. If we instead consider firms that use any currency derivatives, we again find that the firms with financial hedging instruments are more likely to have significant exposure estimates than the sample as a whole (14.8% vs. 10.8% overall). While it may

[9] In contrast, if the sample were evenly split between net exporters and net importers, the mean coefficient would be close to zero and would not be significant. A further consideration in testing the significance of the average $\delta_j$ is that some countries have greater variation in their exchange rates than others, which would affect the magnitude of $\delta_j$. In order to make the estimates of $\delta_j$ comparable across firms, each exchange rate is normalized by its standard deviation over the four year estimation period.

seem perverse that hedgers appear to be more exposed to currency risk than non-hedgers, the results may simply reflect other differences in the two sets of firms. Recall that the hedgers are the larger firms in the sample and thus may have more significant overseas operations than the other firms, making them more exposed to currency movements. Nevertheless, neither group of firms has a large fraction of significant coefficients in the time series regressions.

Another explanation for the currency exposure puzzle is the use of operational hedging. We investigate the effects of operations in two ways. First, as shown in Table 6, we compare exposure estimates of firms with sales to the target country before the deal to those with no presence in the target country before the deal.[10] Second, as shown in Table 7, we consider how the exposure estimates change from before the deal to after the acquisition for exporters and importers.

If operational hedging explains the fraction of significant exposure estimates in the time series regressions, we should see that the firms with business ties to the target country before the deal are more likely to have significant values of $\delta_j$ when we estimate Equation (2). We present the results of these estimations for firms a presence in the country prior to the deal and for firms that had no such business relationship in Table 6. As with the entire sample, neither group exhibits large exposures in the time series regressions. However, among the group of firms with pre-deal business ties to the target country, the estimates of $\delta_j$ are positive about two-thirds of the time, which is more often than would be expected if they were drawn randomly from a mean zero distribution. The average coefficient of .003 is significantly positive with a t-statistic of 3.66. In contrast, firms with no presence in the target country prior to the deal have equal numbers of positive and negative exposure coefficients, as one would expect if they were drawn randomly from a distribution with a mean of zero. And, the average coefficient is not significantly different

[10] Five firms were producing in the target country but not selling there, they are not considered separately.

from zero. This is consistent with foreign sales of U.S. acquirers in the target countries prior to the foreign acquisition leading to a stronger effect of currency risk on their stock returns before the transaction.

The large fraction of firms that sell to the target country prior to the deal suggests that the foreign acquisitions may serve as operational hedges, even if they were undertaken for reasons other than currency risk management. If firms tend to move operations abroad whenever business in the target country is important (and therefore when currency risk might be very large), exchange rate movements may not matter much for stock returns because natural hedging reduces currency exposures (Bartram, Brown and Minton, 2010). Consequently, the acquisitions might dampen the impact of exchange rate shocks on stock returns, and $\delta_{ja}$ would have the opposite sign as $\delta_j$. This means that positive exposures in the pre-merger period will be smaller after the acquisition, i.e. the marginal currency effect $\delta_{ja}$ will be negative for net exporters. Similarly, net importers, i.e. firms with negative exposures in the pre-merger period, will have positive marginal exposures after the transaction.

The effect of operational hedging on the stock return exposures is investigated in Table 7. For net exporters, the currency coefficient is significantly negative on average in the post-merger period (*t*-statistic = -2.67). Likewise, for net importers, the post-merger exposure is less negative (positive coefficient with a cross-section *t*-statistic of 3.13). These results suggest that the acquisitions serve to lower the existing currency exposures of U.S. acquirers. A potential concern is that the results simply reflect reversion to the mean (i.e., a similar set of estimates for a random sample of firms would also show that positive (negative) coefficients are followed by negative (positive) coefficients). We investigate this issue by performing the same analysis for a randomly drawn sample of matching firms, using the acquisition date of each U.S. acquirer as if it occurred

for the match as well. The matched sample consists of 102 firms in the same industry and with similar size as the acquiring sample firms, but that did not do a major acquisition in the target country in the respective period. The estimated changes in the foreign exchange rate exposure of the sample of matched firms, shown in Panel B of Table 7, do not show the opposite sign to the exposure estimated in the pre-merger period and are not statistically significant in the cross-sectional. Thus, the matches indicate that the coefficients for the sample of acquirers are not changing sign simply due to mean reversion. Overall, the results are consistent suggest that the currency risk puzzle owes, at least in part, to operational hedging. That is, these findings are consistent with the idea that firms reduce their currency risk as their foreign business segments grow because expansion involves locating operations abroad (even if the location decision is not motivated by a desire to manage exchange rate risk but simply by operational factors).

## 6. Conclusion

This paper examines the effect of exchange rate risk on the stock returns of U.S. acquirers of foreign target firms to determine whether hedging accounts for the existence of the currency exposure puzzle. As is the case with many previous studies, we find that only a low fraction of exchange rate coefficients are significant in time series regressions of stock returns. This is true whether we examine the currency of a specific country or a much broader index.

We do not find that the use of financial derivatives explains the currency exposure puzzle in our sample. First, only a minority of the sample firms use of exchange rate derivatives in the currency of the target's country. Second, those that do apply financial hedging are actually more likely to have significant estimated exchange rate exposures, although this may reflect their larger size rather than direct causality from derivatives usage to higher currency risk.

We find somewhat greater support for the hypothesis that operational hedging plays a role in exposure estimates. Cross-sectional tests suggest that net exporters' coefficients are less positive after the acquisitions, indicating that the mergers dampen their exposures and similar results hold for net importers. We also find that firms with sales in the target country before the acquisition have positive exposures on average, which means that the acquisitions serve as a natural hedge for the majority of the firms in the sample.

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## Table 1: Summary Statistics for Acquisitions of Foreign Targets by U.S. Firms

The sample consists of 102 acquisitions of public foreign target firms by publicly traded U.S. firms during the sample period 1996-2004. Acquisitions are limited to those where the acquirer obtains more than 50% of the target and where the deal value is at least 5% of the market capitalization of the acquirer. Multinational firms are those that sell to or produce in at least two countries outside of the U.S. prior to the acquisition of the target firm.

**Panel A. Time**

| Year | N |
|---|---|
| 1996 | 3 |
| 1997 | 13 |
| 1998 | 26 |
| 1999 | 21 |
| 2000 | 10 |
| 2001 | 8 |
| 2002 | 6 |
| 2003 | 12 |
| 2004 | 3 |
| Total | 102 |

**Panel C. Geography**

| Target Country | N |
|---|---|
| Australia | 6 |
| Canada | 39 |
| Denmark | 2 |
| France | 1 |
| Germany | 4 |
| Israel | 2 |
| Italy | 2 |
| Mexico | 1 |
| Netherlands | 2 |
| New Zealand | 1 |
| Norway | 4 |
| Singapore | 1 |
| Sweden | 2 |
| Switzerland | 2 |
| Taiwan | 1 |
| Thailand | 1 |
| United Kingdom | 31 |
| Total | 102 |

**Panel B. Deal Characteristics**

| | Mean | Median |
|---|---|---|
| Deal value (US$) | 935.3 | 291.3 |
| Acquiring firm market value (US$) | 3209.5 | 1161.3 |
| Percent of deal compensation paid in stock | 35.7 | 0.0 |
| Percent of deal compensation paid in cash | 57.0 | 72.9 |
| Percent of deals that used debt financing | 4.9 | 0.0 |
| Percent of deals that used equity financing | 43.1 | 0.0 |

**Panel D. Industry**

| Industry | Acquirer | Target |
|---|---|---|
| Business services | 16 | 16 |
| Oil and gas extraction | 13 | 14 |
| Other electrical equipment, not computers | 11 | 11 |
| Precision instruments | 9 | 8 |
| Computers | 8 | 8 |
| Chemicals and allied products | 6 | 7 |
| Paper | 5 | 3 |
| Food and kindred products | 4 | 4 |
| Total of most common industries | 72 | 71 |

**Panel E. Multinationals and Market Value**

| | Mean | Median |
|---|---|---|
| Multinationals prior to deal (n=77) | 3226.8 | 1425.0 |
| Acquisition is first international deal or in same single country as before (n=25) | 3156.0 | 424.3 |

## Table 2: Financial and Operational Hedges

The pre-merger period covers 2 years before the merger, and the post-merger period covers 2 years after the merger.

| | Pre-Merger | Post-Merger |
|---|---|---|
| Acquirer produces in or sells in target country | 71% | |
| Acquirer uses currency derivatives of any kind | 39% | 56% |
| Acquirer uses currency derivatives in target currency | 15% | 33% |
| Acquirer uses forwards in target currency | 11% | 24% |
| Acquirer uses swaps in target currency | 2% | 6% |
| Acquirer uses options in target currency | 2% | 13% |
| Notional value relative to deal value | 27% | 25% |
| Acquirer uses non-currency derivatives | 48% | 50% |
| Acquirer has interest rate swaps | 36% | 39% |
| Acquirer uses energy or commodity derivatives | 24% | 26% |
| | | |
| Target produces outside of target country | 84% | |
| Target sells outside of target country | 91% | |
| Target sells product in the U.S. | 77% | |

## Table 3: Determinants of Foreign Currency Derivatives Usage

The table reports results of logit regressions where the dependent variables are one if the acquiring firm uses any type of foreign currency derivative (models (1)-(4)) and if the firm uses foreign currency derivatives in the currency of the target country (models (5)-(8)), respectively, and zero otherwise. Derivatives usage is measured in the year after the acquisition. Relative deal size is the amount the acquirer paid for the target divided by its market value. Market value of the acquirer is the market value of equity 6 months prior to the acquisition. "Acquirer sells in target country prior to deal" is an indicator variable set to one for firms that had sales in the target country prior to the deal, and zero otherwise. "Acquirer uses interest rate derivatives" is an indicator variable set to one if the acquirer uses interest rate derivatives, and zero otherwise. "Acquirer uses foreign currency debt" is an indicator variable for firms that have debt denominated in the currency of the target's country, and zero otherwise. Chi-squared statistics are reported in bold and marked with *, ** and *** when significant at the 10%, 5% and 1% or lower level, respectively.

| | Derivatives in Target Country Currency | | | | Any Foreign Currency Derivatives | | | |
|---|---|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
| Relative deal size | 1015.5 | 1028.7 | 999.9 | 738.2 | 497.9 | 526.6 | 354.4 | 297.8 |
| | **2.82*** | **2.90*** | **2.71** | **1.25** | **0.71** | **0.79** | **0.34** | **0.22** |
| Market value of acquirer | 0.69 | 0.72 | 0.68 | 0.72 | 0.72 | 0.77 | 0.67 | 0.72 |
| | **15.28***** | **15.51***** | **13.65***** | **15.53***** | **17.19***** | **17.89***** | **13.85***** | **17.46***** |
| Acquirer sells in target | | -0.34 | | | | -0.61 | | |
| country prior to deal | | **0.44** | | | | **1.52** | | |
| Acquirer uses interest rate | | | 0.12 | | | | 1.10 | |
| derivatives | | | **0.06** | | | | **4.86**** | |
| Acquirer uses debt denominated in a foreign currency | | | | 0.94 | | | | 0.65 |
| | | | | **3.48**** | | | | **1.80** |
| Intercept | -10.95 | -11.10 | -10.81 | -11.62 | -9.89 | -10.17 | -9.53 | -10.05 |
| | **16.90***** | **17.14***** | **15.84***** | **17.47***** | **15.81***** | **16.13***** | **13.59***** | **16.41***** |
| N | 102 | 102 | 102 | 102 | 102 | 102 | 102 | 102 |
| Dependent variable is one | 34 | 34 | 34 | 34 | 57 | 57 | 57 | 57 |
| Pseudo $R^2$ | 0.18 | 0.18 | 0.18 | 0.21 | 0.21 | 0.22 | 0.25 | 0.22 |

## Table 4: Exchange Rate Exposure of U.S. Acquirers

The table shows the results of regressions of the stock returns of each acquiring firm on the percentage change in an exchange rate variable and the return on the value-weighted U.S. stock market index during the four years surrounding the acquisition. The exchange rate is either measured by a trade-weighted basket of currencies (Panel A) or the bilateral exchange rate of the U.S. dollar to the target country currency (Panel B). In the latter case, the exchange rate change is normalized, as described in the main text. Exchange rates are in U.S. dollars relative to foreign currency. The table shows the percentage of significant positive and negative coefficients at the 5% significance level, average coefficients as well as associated *t*-statistics.

| | Weekly data (n=102) | | Monthly data (n=102) | |
|---|---|---|---|---|
| | Exchange Rate | U.S. Market Index | Exchange Rate | U.S. Market Index |
| A. Exposure to Multilateral Exchange Rate | | | | |
| Percent significant positive | 10.8% | 91.2% | 8.8% | 74.5% |
| Percent significant negative | 2.0% | 0.0% | 0.0% | 0.0% |
| Average coefficient | 0.218 | 1.048 | 0.287 | 1.048 |
| Cross-section *t*-statistic | 2.94 | 17.55 | 2.39 | 14.53 |
| B. Exposure to Bilateral Exchange Rate | | | | |
| Percent significant positive | 11.8% | 89.2% | 10.8% | 69.6% |
| Percent significant negative | 1.0% | 0.0% | 1.0% | 0.0% |
| Average coefficient | 0.003 | 1.005 | 0.008 | 1.193 |
| Cross-section *t*-statistic | 3.64 | 16.77 | 3.27 | 13.01 |

## Table 5: Derivatives and Exchange Rate Exposures of U.S. Acquirers

The table shows the results of regressions of the stock returns of firms that hedge with currency derivatives on the percentage change in an exchange rate variable and the return on the value-weighted U.S. stock market index during the four years surrounding the acquisition. Hedging is examined in the year before the acquisition and is based on the use of any kind of currency derivative. The exchange rate is either measured by a trade-weighted basket of currencies (Panel A) or the bilateral exchange rate of the U.S. dollar to the target country currency (Panel B). In the latter case, the exchange rate change is normalized, as described in the main text. Exchange rates are in U.S. dollars relative to foreign currency. The table shows the percentage of significant positive and negative coefficients at the 5% significance level, average coefficients as well as associated *t*-statistics.

| | Firms that Hedge with Target Country Currency Derivatives (n=40) | | Firms without Target Country Currency Derivatives (n=62) | | Firms with Any Currency Derivatives (n=61) | |
|---|---|---|---|---|---|---|
| | Exchange Rate | U.S. Market Index | Exchange Rate | U.S. Market Index | Exchange Rate | U.S. Market Index |
| A. Exposure to Multilateral Exchange Rate | | | | | | |
| Percent significant positive | 17.5% | 85.0% | 6.5% | 95.2% | 14.8% | 88.5% |
| Percent significant negative | 2.5% | 0.0% | 1.6% | 0.0% | 3.3% | 0.0% |
| Average coefficient | 0.194 | 0.839 | 0.234 | 1.167 | 0.141 | 0.955 |
| Cross-section *t*-statistic | 1.69 | 9.66 | 2.39 | 15.41 | 1.40 | 12.48 |
| B. Exposure to Bilateral Exchange Rate | | | | | | |
| Percent significant positive | 15.0% | 82.5% | 9.7% | 93.6% | 13.1% | 86.9% |
| Percent significant negative | 2.5% | 0.0% | 0.0% | 0.0% | 1.6% | 0.0% |
| Average coefficient | 0.003 | 0.798 | 0.002 | 1.139 | 0.002 | 0.924 |
| Cross-section *t*-statistic | 2.80 | 8.98 | 2.41 | 14.99 | 2.48 | 11.98 |

## Table 6: Exchange Rate Exposure and Pre-Merger Activity of Acquirers in the Target Country

The table shows statistics on the bilateral exchange rate exposure of U.S. acquirers in the pre-merger period by activity in the target country prior to the merger. Results are presented separately for the full sample, acquirers that sell in the target country prior to the deal, and for acquirers that have no presence in the target country prior to the deal. The percentage of firms with significant positive or significant negative foreign exchange rate exposures is at the 5% level. Foreign exchange rate exposure is estimated as the coefficient on the normalized bilateral exchange rate between the U.S. dollar and the currency of the target firm in a regression of acquirer stock returns on the exchange rate change and the return on the U.S. value-weighted stock market index during two years prior to the acquisition.

| | Full Sample | Acquirer Sells in Target Country Prior to Deal | Acquirer Has No Presence in Target Country Prior to Deal |
|---|---|---|---|
| Number of firms | 102 | 67 | 30 |
| Percent of sample | 100.0% | 65.7% | 29.4% |
| | | | |
| Exchange Rate Exposure in Pre-Merger Period | | | |
| Positive | 63.7% | 68.7% | 50.0% |
| Significant positive | 7.8% | 6.0% | 6.7% |
| | | | |
| Negative | 36.3% | 31.3% | 50.0% |
| Significant negative | 1.0% | 1.5% | 0.0% |
| | | | |
| Average | 0.003 | 0.003 | 0.002 |
| Cross-sectional *t*-statistic | 3.59 | 3.66 | 1.32 |
| Cross-sectional *p*-value | 0.001 | 0.001 | 0.198 |

## Table 7: Bilateral Exchange Rate Exposures of Net Exporters and Net Importers

The table shows results on the exchange rate exposure of U.S. acquirers before and after the merger (Panel A) and a sample of matched firms without acquisitions (Panel B). Panel A presents exposure estimates for acquiring firms, separately for net exporters and net importers. Net exporters (importers) are firms with a positive (negative) exchange rate exposure prior to the acquisition, where the exposure is measured as the coefficient on the normalized bilateral exchange rate between the U.S. dollar and the currency of the target firm during the two years prior to the acquisition, controlling for the return on the value-weighted U.S. market index. Panel B shows results for a matched sample of 102 firms in the same industry and having similar sizes to the acquiring sample firms, but which did not do a major acquisition in the target country. Matching firms have estimated coefficients on exchange rates for the same time period as the associated acquiring firm. The table shows, separately for pre-merger and post-merger period, the average coefficients as well as associated *t*-statistics and *p*-values.

| | Pre-Merger | | Post-Merger | |
|---|---|---|---|---|
| | Bilateral Exchange Rate | U.S. Market Index | Bilateral Exchange Rate | U.S. Market Index |
| A. Acquiring Firms | | | | |
| Net Exporters (N=66) | | | | |
| Average coefficient | 0.008 | 1.035 | -0.004 | -0.043 |
| Cross-section *t*-statistic | 10.07 | 12.23 | -2.67 | -0.56 |
| Cross-section *p*-value | 0.001 | 0.001 | 0.010 | 0.581 |
| Net Importers (N=36) | | | | |
| Average coefficient | -0.004 | 1.035 | 0.006 | 0.073 |
| Cross-section *t*-statistic | -5.92 | 11.93 | 3.13 | 0.70 |
| Cross-section *p*-value | 0.001 | 0.001 | 0.003 | 0.488 |
| B. Matched Sample | | | | |
| Net Exporters (N=66) | | | | |
| Average coefficient | 0.006 | 0.865 | 0.000 | 0.148 |
| Cross-section *t*-statistic | 5.78 | 11.63 | -0.36 | 2.14 |
| Cross-section *p*-value | 0.001 | 0.001 | 0.723 | 0.036 |
| Net Importers (N=36) | | | | |
| Average coefficient | -0.003 | 1.046 | -0.004 | 0.000 |
| Cross-section *t*-statistic | -2.43 | 11.34 | -1.92 | 0.00 |
| Cross-section *p*-value | 0.020 | 0.001 | 0.063 | 0.998 |