Measuring the economic importance of exchange rate exposure

Craig Doidge [a], John Griffin [b],*, Rohan Williamson [c]

[a] Rotman School of Management, University of Toronto, Canada
[b] McCombs School of Business, University of Texas, Austin, USA
[c] McDonough School of Business, Georgetown University, Washington, DC, USA

Abstract

This paper re-examines the nature and the economic significance of the exchange rate to firm value relation using a database of non-financial firms from over 18 countries. Our main contribution is to apply a portfolio approach to investigate the economic importance of exposure. We find that firms with high international sales outperform those with no international sales during periods of large currency depreciations by 0.72% per month, whereas they underperform by 1.10% per month during periods of large currency appreciations. In contrast to the previous literature, our evidence shows that exchange rate movements can have an economically significant impact on firm value.
© 2006 Published by Elsevier B.V.

While finance theory, firm-level survey results, and common intuition strongly support the notion that firm value is sensitive to exchange rate movements, empirical support is mixed. Studies that examine exchange rate exposure generally find some evidence of a relation between exposure and its theoretical determinants but that the economic importance of this relation is small. In this paper, we use firm-level data from 18 countries to systematically examine the nature of exposure around the world. To assess the economic magnitude of exchange rate exposure, we use a portfolio approach that is new to the exposure literature. Our main result is that exchange rates play an economically sizeable role in explaining stock returns.

---

* Corresponding author.
  E-mail address: John.griffin@mccombs.utexas.edu (J. Griffin).

Prior studies in the empirical exposure literature have primarily focused on estimating exposure in a regression framework and testing whether the estimated exposure betas are consistent with the theoretical determinants of exposure. Jorion (1990) finds evidence of significant exchange rate exposure and shows that the level of foreign sales is the main determinant of exchange rate exposure for large U.S. multinational firms. However, Amihud (1994) and Bartov and Bodnar (1994) find no evidence of contemporaneous exposure for U.S. multinationals, although Bartov and Bodnar do show that U.S. firms respond to past quarterly exchange rate movements. Using a sample of Japanese firms, He and Ng (1998) uncover a strong contemporaneous relation between foreign sales and exposure but find no evidence of a lagged relation. Dominguez and Tesar (2001, 2006) find a link between foreign activity and exposure in a sample of firms from eight non-U.S. countries, including Japan.

The various findings regarding the nature of the exposure relation highlight the need for a systematic comparison of exchange rate exposure across time, countries, and determinants. To this end, we expand the investigation of the nature of the relation between exposure and firm characteristics by using unique firm-level data with broad coverage across markets. Our study begins with the linear regression framework that is traditionally used in the exposure literature. Consistent with the previous literature, we find that the number of firms that are exposed to exchange rate movements is greater than what can be attributed to chance, but that exchange rate movements are often not statistically or economically important. We then evaluate whether exchange rate exposure varies in a manner consistent with firm-level characteristics such as international sales, foreign income, foreign assets, and firm size and find that international sales is most reliably related to exposure.

A common finding in the empirical exposure literature is that exchange rate movements do not explain a large proportion of the variation in stock returns. Although it is not the focus of the analyses, Jorion (1990) and Bartov and Bodnar (1994) find that exchange rates have low explanatory power (as measured by R^2) for explaining individual stock returns. Griffin and Stulz (2001) demonstrate that in a variety of settings, exchange rate movements explain only a small amount of movement in international industry (and U.S. individual) stock returns. Our results based on the regression framework provide a broader confirmation of previous evidence that exchange rate movements do not explain much of the variation in individual firms' stock returns.

The main contribution of this paper is to employ a portfolio approach to measure the economic importance of exposure. Evidence that suggests the economic importance of exposure is small is based on calculating the fraction of the variation of firms' stock returns that are related to exchange rate movements. For some applications, such as hedging, a firm-level perspective may be relevant. However, from the perspective of a portfolio manager, an investor who holds a diversified portfolio, or simply an economist who wishes to assess the average relation between firm value movements and exchange rates, the relevant issue is whether exchange rate movements affect the returns on certain groups of stocks more than others.

To evaluate the economic impact of exchange rate movements on stock returns, we form portfolios that are long in firms with high international sales and short in firms with no international sales. This approach, which has not been used in the existing exposure literature, has two main advantages. First, it focuses on returns rather than changes in the adjusted R^2. If exchange rates impact firms with high international sales and firms with no international sales differently, then the difference in returns between these groups of firms should be an informative gauge of the impact of exchange rates on firm value. Second, the regression framework assumes that exposures are linear and constant, which is unlikely to be true in many cases. The portfolio approach allows exposures to be both non-linear and time varying.