

Exchange rate exposure, hedging, and the use of foreign currency derivatives

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Abstract

We examine whether firms use foreign currency derivatives for hedging or for speculative purposes. Using a sample of S&P 500 nonfinancial firms for 1993, we find evidence that firms use currency derivatives for hedging, as their use, significantly reduces the exchange-rate exposure firms face. We also find that, while the decision to use derivatives depends on exposure factors (i.e., foreign sales and foreign trade) and on variables largely associated with theories of optimal hedging (i.e., size and R&D expenditures), the level of derivatives used depends only on a firm's exposure through foreign sales and trade. © 2001 Elsevier Science Ltd. All rights reserved.

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1. Introduction

Exchange-rate movements affect expected future cash flows, and therefore the value, of large multinationals, small exporters (importers) and import competitors, by changing the home currency value of foreign revenues (costs) and the terms of competition. In light of this, it is surprising that previous research in the area (Jorion, 1990; Amihud, 1993; Bodnar and Gentry, 1993) finds that US multinationals, exporters, and manufacturing industries are not significantly affected by exchange-rate movements.

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One possible explanation is the fact that corporations make extensive use of foreign currency derivatives and other hedging instruments (e.g., foreign debt) to protect themselves from unexpected movements of exchange rates.¹ To the extent that US multinationals, exporters, and importers fully cover their exposure to exchange-rate movements, we should not expect to find any effect of exchange-rate movements on firms' values. However, derivatives can also be used for speculative purposes, as alleged in the much publicized stories of Procter & Gamble and Metallgesellschaft. This creates a genuine concern for investors and regulators as to what role derivatives play in a corporation.

In this paper, we examine whether firms use foreign currency derivatives for hedging or for speculative purposes. In particular, to identify a firm's hedging or speculative behavior in the data, we examine (a) the effect of foreign currency derivative use on its exchange-rate exposure and (b) the determinants of the amount of derivative use. We measure exchange-rate exposure as the sensitivity of the value of the firm, proxied by the firm's stock return, to an unanticipated change in an exchange rate, as defined in Adler and Dumas (1984). We test the hypothesis that using foreign currency derivatives for hedging reduces a firm's foreign exchange-rate exposure, and that the degree to which firms use derivatives is related to its exposure through foreign sales and foreign trade.

Many papers examine which theory of optimal hedging is consistent with the use of derivatives that we observe in the data.² However, there is no direct evidence that derivatives are actually used to hedge. Hentschel and Kothari (1997) and Simkins and Laux (1997) examine directly firms' use of currency derivatives, but the former does not find any evidence and the latter finds only weak evidence that their use influences exposure. However, given that a firm's exchange-rate exposure is determined by both its real operations (i.e., foreign sales) and its financial hedging activities, we estimate a multivariate regression that links a firm's exposure to both those factors. This contrasts with Hentschel and Kothari, who rely only on univariate tests. We also use a continuous variable for hedging, instead of the dummy variable used by Simkins and Laux. When the dummy is used by itself, it appears to be negatively related to a firm's exposure. However, when the authors use their measure of hedging and foreign sales in the same model, the effect of the hedging dummy is no longer significant and its sign (positive) is inconsistent with the hypothesis that firms use derivatives to hedge.

Using a sample of S&P 500 nonfinancial firms for 1993, we find that a firm's exchange-rate exposure is positively related to its ratio of foreign sales to total sales,

¹ There are several theories that suggest why it may be optimal for a firm to hedge (e.g., Stulz, 1984; Smith and Stulz, 1985; Froot et al., 1993; DeMarzo and Duffie, 1995).

² See, e.g., Nance et al. (1993), Dolde (1993), Francis and Stephan (1990) and Mian (1996) for all types of derivatives; Tufano (1996) and Haushalter (2000) for commodity derivatives; and Geczy et al. (1997) for foreign currency derivatives.

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