



Foreign exchange risk and the cross-section of stock returns

James W. Kolari^{a,*}, Ted C. Moorman^b, Sorin M. Sorescu^a

^a *Mays Business School, Texas A&M University, College Station, TX 77843-4218, USA*

^b *Northern Illinois University, Department of Finance, DeKalb, IL 60115, USA*

Abstract

We examine the relation between the cross-section of US stock returns and foreign exchange rates during the period from 1973 to 2002. We find that stocks most sensitive to foreign exchange risk (in absolute value) have lower returns than others. This implies a non-linear, negative premium for foreign exchange risk. Sensitivity to foreign exchange generates a cross-sectional spread in stock returns unexplained by existing asset-pricing models. Consequently, we form a zero-investment factor related to foreign exchange-sensitivity and show that it can reduce mean pricing errors for exchange-sensitive portfolios. One possible explanation for our findings includes Johnson's [2004. Forecast dispersion and the cross-section of expected returns. *Journal of Finance*, 59, 1957–1978] option-theoretic model in which expected returns are decreasing in idiosyncratic cashflow volatility.

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1. Introduction

A long-standing controversy exists concerning whether expected stock returns are affected by foreign exchange rates. On the one hand, the pricing of exchange rate risk receives considerable support from theory. The International Capital Asset Pricing Model (ICAPM) proposes

* Corresponding author. Tel.: +1 979 845 4803; fax: +1 979 845 3884.

E-mail address: j-kolari@tamu.edu (J.W. Kolari).

that the covariance of assets with currency returns should be a priced factor in a world where purchasing power parity is violated (e.g., see Adler and Dumas (1983), Solnik (1974), and Sercu (1980)).¹ In this regard, the market price of foreign exchange risk can be positive or negative, depending on the level of individual investors' relative risk aversion.² On the other hand, contrary to theoretical arguments favoring the pricing of exchange rate risk in stock returns, supporting empirical evidence is mixed.³ Jorion (1991) examines the pricing of exchange rate risk for a sample of multinational US stocks and concludes that it is not priced. Griffin (2002) arrives at a similar conclusion after observing that the addition of exchange risk factors to standard asset-pricing models results in an increase in the absolute value of the intercepts, implying that pricing errors are magnified with the inclusion of exchange risk factors. By contrast, De Santis and Gérard (1998) employ an ICAPM framework with aggregate stock market indexes for four major industrial countries and find that currency risk is priced. During the period from 1980 to 1985, they document a negative premium for currency risk of sufficiently large magnitude to cause total risk premia on stocks around the world to be negative. In the years 1989–1994, they find that currency risk accounts for up to 64% of total risk premia worldwide (with the exception of the US where this proportion is smaller). However, in some periods they find positive foreign exchange risk premia, which they note does not agree with Adler and Dumas' theoretical negative risk premium observed for high levels of risk aversion.⁴

De Santis and Gérard's findings relate only to aggregate stock returns and provide no evidence regarding the effect of foreign exchange risk on individual securities. Recent work by Vassalou (2000) extends previous studies by testing for exchange rate risk among individual securities for 10 countries in the 1973–1990 period. Empirical models are developed to comparatively test the ICAPM models of Adler and Dumas (1983) as well as Solnik (1974) and Sercu (1980). Decomposing exchange rate movements into common and residual components, she finds that both common and residual exchange rate risk are often priced in securities. Like De Santis and Gérard, both positive and negative exchange risk premia are found; however, negative (positive) premia are normally associated with the common (residual) component of exchange rate risk.

For the cross-section of US stocks, Vassalou finds that the common component of foreign exchange risk is not priced, while the residual component has a positive market price. However, Vassalou's analysis of US stocks is restricted to 400 companies that have continuously traded

¹ In this regard, Black (1989, 1990) argues that optimal hedging of exchange rate risk is less than 100%.

² According to Adler and Dumas (1983, pp. 943–944), risk-averse investors optimally hold a portfolio comprised of two components held in weights α and $1 - \alpha$, respectively: (1) a Markowitz efficient portfolio that is the same for all investors regardless of nationality, and (2) a global minimum variance portfolio in real terms that is specific to each individual investor. The latter component represents a hedge portfolio against inflation relevant to the individual investor and, therefore, is associated with exchange rate risk. Adler and Dumas argue that investors have an incentive to hedge their stock holdings against currency risk by means of local borrowing. Given a particular future date, they define a company's sensitivity to foreign exchange rates as the amount of foreign currency deposited in a bank with equal exposure to exchange rate risk as the firm's commercial operations. Since an optimal hedge against these foreign currency deposits can be created by local borrowing, foreign exchange risk is associated with a negative market price of risk.

³ In a comprehensive survey paper, Karolyi and Stulz (2003) observe that the issue of exchange rate risk and stock returns remains unsettled and note the scarcity of empirical research dedicated to this question despite the strong theoretical support for an exchange rate factor.

⁴ This evidence is consistent with the time varying market price of foreign exchange risk reported in Dumas and Solnik (1995) with respect to stock market indexes in Germany, the U.K., Japan, and the US.

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