

# Exchange rate and foreign inflation risk premiums in global equity returns

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## Abstract

We test for the pricing of exchange rate and foreign inflation risk in equities. Our tests are motivated by the empirical implications of the models of Solnik (1974b) [Solnik, B., 1974b. The international pricing of risk: an empirical investigation of the world capital market structure. *Journal of Finance* 365–377] as revised by Sercu (1980) [Sercu, P., 1980. A generalization of the international asset pricing model. *Revue de l'Association Française de Finance* 1, 91–135], Grauer et al. (1976) [Grauer, F., Litzenberger, R., Stehle, R., 1976. Sharing rules and equilibrium in an international capital market under uncertainty. *Journal of Financial Economics* 3, 233–256], and Adler and Dumas (1983) [Adler, M., Dumas, B., 1983. International portfolio choice and corporation finance: a synthesis. *Journal of Finance* 38, 925–984]. Both exchange rate and foreign inflation risk factors can explain part of the within-country cross-sectional variation in returns. Our results have important implications for hedging exchange rate risk. They also demonstrate that home bias, at least in US equity portfolios, cannot be the result of US investors' efforts to hedge their domestic inflation. © 2000 Elsevier Science Ltd. All rights reserved.

*Keywords:* International asset pricing; Foreign inflation risk premiums; Exchange rate risk premiums

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## 1. Introduction

The benefits of international diversification have been known for many decades, but it is only recently that investors have started allocating a significant portion of their portfolio holdings in foreign equities. To manage the risk of international port-

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folios, investors need to know the factors that explain the cross-sectional and cross-country variation in global equity returns.

Several studies have documented that the world market factor is an important determinant of asset returns (see, e.g., Solnik, 1974a; Stehle, 1977; Jorion and Schwartz, 1986; Korajczyk and Viallet, 1989; Harvey, 1991). There is also evidence that exchange rate and world inflation risk factors can explain part of the cross-country differences in the returns of equities (see, for instance, Dumas and Solnik (1995), and Ferson and Harvey (1994) among others). However, there is still no sufficient evidence to suggest that exchange rate and world inflation factors can also explain the within-country cross-sectional differences in returns. Our study contributes to this literature by testing for the presence of exchange rate and foreign inflation risk premiums in the cross-section of equity returns using individual security data from 10 developed markets.<sup>1</sup>

The hypotheses we test are motivated by three international asset pricing models, namely those of Adler and Dumas (1983), Solnik (1974b), Sercu (1980), and Grauer et al. (1976). We find that both exchange rate and foreign inflation risk factors can explain part of the within-country variation in average returns.

To test for the pricing of exchange rate risk, we combine information for a cross-section of exchange rates into two indexes. The first one, the common component index, combines information that is common to all exchange rates, whereas the second, the residual component index, captures fluctuations that are specific to the individual exchange rates. Our procedure has the advantage of reducing the dimensionality of exchange rates whereas at the same time it results in the inclusion of more information about changes in exchange rates in our tests than the single index approach adopted in previous studies. Our results reveal that at least part of the exchange rate risk premium in equities is attached to the residual components of exchange rates which were overlooked in previous studies. These components have important implications for the pricing and hedging of exchange rate risk.

Both the Grauer, Litzenberger, and Stehle model and the Adler and Dumas model suggest that inflation risk is priced. However, the testable implications of the two models are different. The Adler and Dumas model suggests the presence of as many inflation risk premiums in equities as there are countries. In contrast, the Grauer, Litzenberger, and Stehle model suggests that equities carry a single risk premium with respect to inflation. This is a result of their assumption that the purchasing power parity holds, and therefore that all stochastic inflation rates collapse to a single rate when they are expressed in terms of the same reference currency. To test the implications of the two models and to discriminate between them empirically, we test for the number of inflation risk premiums present in equity returns. In particular, we test whether US inflation is priced in all 10 countries and whether, in its presence, additional inflation rates earn a risk premium. We find that US inflation risk is priced

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<sup>1</sup> Note that Jorion (1991) tested for the pricing of exchange rate risk in US equities and found that it is not priced. Furthermore, Chen et al. (1986) and Ferson and Harvey (1991) tested for the pricing of US inflation risk in US equities and found mixed results.

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