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Market liquidity risks of foreign exchange derivatives and cross-country equity portfolio allocations

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ABSTRACT

Foreign exchange derivatives (FXD) are important tools for hedging foreign exchange (FX) risks and enhancing returns of international portfolios. However, the ability to use FXD can be constrained by higher trading costs and the liquidity risks of the FXD available in different markets/currencies across countries. In this study, we investigate whether the wide cross-sectional and temporal variations observed in the liquidity level of FXD markets are associated with the cross-country allocation decisions of foreign portfolio investors. Using an extensive dataset of 40 countries and a number of alternative specifications, our study finds that investors tend to allocate more wealth in countries that provide liquid and cost-effective opportunities for using FXD. Our results suggest that regulatory reforms aimed at developing FXD markets could be a potential policy measure for attracting higher levels of foreign equity portfolio investments.

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1. Introduction

Although international portfolio investment diversifies country-specific risks to a considerable extent, it also exposes investors to foreign exchange (FX) risks (see [Eun and Resnick, 1988, 1994](#); [Glen and Jorion, 1993](#)). Within the standard framework of international portfolio allocations, [Fidora et al. \(2007\)](#) provide strong evidence that equity portfolio investors face real FX risks when investing abroad.¹ Drawing on the framework of asset pricing models, a number of studies also show that international portfolio investors require a material FX risk premium at the market level ([Carriero et al., 2006](#); [De Santis and Gerard, 1998](#); [Dumas and Solnik, 1995](#)).

In terms of managing FX risk, studies on theoretical portfolio optimization show that hedging FX risk improves the risk-return profile of international portfolios relative to an unhedged portfolio (see [Eun and Resnick, 1988](#); [Jorion, 1993](#)). Further, [Duffie et al. \(2010\)](#) suggest that if used responsibly, foreign exchange derivatives (FXD) provide important risk management and liquidity benefits to the financial system as well as non-financial corporations and other market participants. Using

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¹ Column 5 of [Table 1](#) (discussed in detail under Section 3.1) shows the country-specific standard deviations of real effective FX rates. In the absence of FX risk, provided purchasing power parity (PPP) holds, these figures for all countries should be zero. However, as seen from the positive figures, the FX rate significantly deviates from PPP and poses material real FX risks for international investors.

a sample of the U.S. investors, [Perold and Schulman \(1988\)](#) empirically demonstrate that FX hedging reduces risk. Such practices of hedging FX risks are also extensively followed by professional investors.²

Studies also demonstrate that FXD are utilized to enhance returns. For example, [Cao et al. \(2011\)](#) demonstrate that international mutual funds are significant users of FXD, and such funds display higher risk-adjusted returns than other funds. In addition to hedging FX risks and return enhancing motives, [Cao et al. \(2011\)](#) also note two other alternative motives for using FXD by fund managers. The first is insurance against extreme events, particularly the abrupt fall in asset prices during periods of financial crises and the second is to try and maximise their own performance to meet market expectations.

The evidence in the literature and professional practice clearly supports the view that foreign portfolio investors make extensive use of FXD for various purposes. However, [Culp and Mackay \(1994\)](#) note that institutions/investors face market liquidity risks,³ amongst others, in the trading of FXD. Similarly, [Duffie et al. \(2010\)](#) also show that rapid reduction in market liquidity is one of the major risks in FXD markets. Based on the findings of a survey of FXD usage by US non-financial firms, [Bodnar et al. \(1996\)](#) further demonstrate that transaction costs⁴ (dealer fees) and market liquidity risk associated with usage of FXD generates high levels of constraints for the users of FXD. Liquidity risks of FXD are even more concerning for the comparatively thinly traded and informationally more opaque emerging markets' currencies.⁵ For example, [Henderson \(2002\)](#) show that relative to FXD trading in developed markets, liquidity level in emerging markets is much lower, implying higher transaction costs. [Madura and Fox \(2011\)](#) show that the bid-ask spread on forward contract transactions are much higher on currencies from emerging markets. [Bekaert and Hodrick \(2012\)](#) also note that the most liquid currencies (those typically trading at a spread of less than 10 pips) are the "G10" currencies⁶ with currencies from the emerging markets trading at significantly higher spreads.⁷

Given the role of FXD in international portfolio investments and heterogeneous level of market liquidity/trading costs across different FXD markets, our study examines whether differences in market liquidity risks/trading costs of FXD are associated with the cross-country allocation decisions of international portfolio investors. Following [Cooper and Kaplanis \(1986\)](#),⁸ the framework of ICAPM suggests that higher liquidity risks and trading costs generate higher magnitude of dead-weight costs, which reduce portfolio returns. As such, we hypothesize that countries/currencies with highly liquid and cost-effective FXD markets attract higher levels of foreign equity portfolio allocations.

Incorporating two different types of unique and comprehensive FX liquidity dataset of 40 host countries (developed and emerging) our paper reports two important findings. First, the univariate analysis indicates significant cross-sectional variations in the liquidity levels of different FXD markets/currencies. The results also confirm that compared to their developed counterparts, the majority of emerging markets/currencies, which attract relatively lower share of foreign equity portfolio investments, also have smaller and illiquid FXD markets with comparatively higher costs of hedging FX risks. Evidence also suggests that FX risks in emerging markets are materially higher than developed markets, which further implies that the necessity of hedging FX risks is more prominent for emerging markets' currencies.⁹

Second, our extensive regression analysis shows that portfolio investors tend to allocate more wealth in the equities of those countries/currencies which exhibit highly liquid and cost-effective FXD markets. Our results are robust to different specifications addressing omitted variable bias, reverse causality, market free float, effects of major financial centres and the use of alternative proxies of FXD market liquidity. In other words, our study for the first time provides strong indications that liquidity risks/trading costs of using FXD is an important determinant in the cross-country portfolio allocations of foreign investors. The empirically robust results suggest that reforms aimed at increasing the depth and breadth of FXD markets could have significant positive implications for attracting higher levels of foreign portfolio investments, particularly for emerging markets.

This paper makes three important contributions to the literature. First, while hedging in international investments is pervasive in practice, this relation between hedging FX risks and international portfolio diversification, to the best of our knowledge, has so far not been investigated in the literature. We investigate this issue of hedging the FX risks within the

² From a practitioner's point of view, Macquarie's Walter Scott Global Equity Fund (Hedged), an Australian domiciled fund, reports the following use of FX risk hedging to its investors in the product disclosure statement: "In addition to gaining exposure to Walter Scott's investment process via the underlying fund, Macquarie aims to substantially hedge the fund's exposure to international assets back to Australian dollars. As a result, your exposure to currency fluctuation and the risk of decline in the Australian dollar value of the fund's investments due to these fluctuations will be reduced when compared to an un-hedged strategy otherwise making the same investment" (see www.macquarie.com.au/dafiles/Internet/mgl/au/docs-pa/pds/walter-scott-global-equity-fund-hedged.pdf, pp. 5).

³ They define market liquidity risk as the risk that a large trading might have an adverse impact on its market price and/or an abrupt movement in price or volatility may render it difficult to hedge or unwind a losing position, including a derivative position. As such, a sharp market movement may compel investors to initiate new positions or replace defaulted contracts, both of which may be complicated by high market liquidity risks, i.e. by adverse liquidity shocks.

⁴ Liquidity level is shown to be inversely related to transaction costs as high trading costs cause investors to trade less (see [Bekaert et al., 2007](#); [Levine and Zervos, 1998a,b](#)).

⁵ [Duffie et al. \(2010\)](#) recommend that increased market transparency to the investors enhances price-discovery function of FXD markets, improving the provision of liquidity to hedgers.

⁶ GBP, USD, EUR AUD, JPY, CHF, CAD, NZD, SEK and NOK.

⁷ See [Table 1](#) for further evidence from the dataset used in this study.

⁸ Discussed in Section 2.

⁹ The figures in column 6 of [Table 1](#) demonstrate that compared to developed markets, emerging markets' currencies are more volatile and pose significant real FX rate risks.

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