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# Journal of International Money and Finance

journal homepage: [www.elsevier.com/locate/jimf](http://www.elsevier.com/locate/jimf)



## FX market liquidity, funding constraints and capital flows



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### ARTICLE INFO

#### Article history:

Available online 13 December 2014

#### JEL Classification:

F31

G15

#### Keywords:

Foreign exchange

Liquidity

Funding liquidity constraints

Capital flows

Microstructure

### ABSTRACT

We investigate the determinants of the time variation of the common component of FX market liquidity across developed and emerging market currencies. We study the impact of funding liquidity constraints, which proxy for supply considerations, and capital flows, which proxy for demand considerations of liquidity on transaction costs. Our results show that (i) funding liquidity constraints measured by the availability of outstanding repos reduce FX market liquidity, and their impact is stronger when they are associated with an increase in the costs of funding and a shortening of their maturity; (ii) increasing capital flows at the global level increase liquidity; (iii) both of these effects were stronger during the recent financial crisis, when liquidity dry-ups were severe; and (iv) the analysis of individual currencies with diverse riskiness confirms that a shock to speculator capital would lead to a reduction in market liquidity through a spiral effect that is stronger for more volatile currencies. Furthermore, we find a similar effect related to capital flows.

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## 1. Introduction

Trading volume in the foreign exchange (FX) market is particularly high compared to other financial markets. Whether the large trading volume corresponds to a highly liquid FX market

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depends on the definition of liquidity adopted and the proxy employed to measure it. With respect to trading volume and the bid-ask spread, there are significant differences across currencies and through time. There is also evidence of a strong systematic component. In fact, in their account of the events of the 2007/9 financial crisis, [Melvin and Taylor \(2009\)](#) document strong liquidity drops across currencies. Albeit a systemically important global market, the liquidity of the FX market has begun to attract the attention of researchers only relatively recently. For instance, measuring liquidity as the temporary price impact of transactions, recent studies have documented the presence of a common component in FX market liquidity across currencies ([Banti et al., 2012](#); [Mancini et al., 2013](#)). In this paper, we investigate the determinants of the time-variation in this common component. In particular, we study the impact of funding liquidity constraints, which proxy for supply considerations, and capital flows, which proxy for demand considerations of liquidity on transaction costs.

Recently, a literature on the interaction of market liquidity and funding liquidity has emerged in order to provide an explanation to the severity of the liquidity drop observed during the recent financial crisis ([Brunnermeier and Pedersen, 2009](#); [Hameed et al., 2010](#); [Acharya and Skeie, 2011](#); [Acharya and Viswanathan, 2011](#)). That is, traders' financial constraints influence the liquidity of financial markets ([Shleifer and Vishny, 1997](#); [Gromb and Vayanos, 2002](#)). It is important to underline the systematic nature of such an effect: funding liquidity constraints affect all the operations of traders, creating a systematic source of variation in liquidity across financial assets. Furthermore, recent studies have proposed an effect of institutional investors' behavior and correlated trading as a source of commonality across assets and markets ([Kamara et al., 2008](#); [Koch et al., 2012](#)). Moreover, [Károlyi et al. \(2012\)](#) show that these demand-side factors are more relevant as determinants of liquidity commonality across stocks than the supply-side factors related to the funding constraints story.

Building on the recent theoretical literature on the interaction of funding liquidity and market liquidity, we examine whether the time-variation in FX market liquidity is due to changes in the funding liquidity of the principal traders in FX, namely the financial intermediaries. Indeed, bearing in mind that the ease with which financial intermediaries are able to finance their operations has an impact on traders' operations in the cross-section of the financial assets they trade, we expect to find a positive relationship between changes in funding constraints and market illiquidity.

In line with the literature on the role of the demand for liquidity, we extend our analysis to the investigation of the impact of capital flows between the US and foreign countries on the FX market illiquidity. Investigating the effect of the pressure on currency markets of cross-border investment flows, it is important to note that this proxy of liquidity demand comprises different investors. In fact, international capital flows in stocks and bonds may arise from investments in these assets that require currency trades as a by-product, or may be the by-product for investments in currencies. From the perspective of the FX market, these flows include both liquidity traders that enter the market via dealers and sophisticated informed traders, such as hedge funds and large banks, that are active on the interdealer market themselves ([Osler, 2008](#); [Rime and Schrimpf, 2013](#)). The distinction is important, the latter provide liquidity to the overall market, whereas the former demand liquidity on the customer-dealer segment of the FX market. However, the high concentration of FX dealers allows them to match a large part of trades directly among their customer base, thus reducing the need to build inventory positions ([Menkhoff et al., 2013](#)). As a result, we expect larger capital flows to improve market liquidity because sophisticated investors are more active on the interdealer FX market and dealers reduce their spreads due to lower inventory risk as their customer base trades increase. Furthermore, in our investigation of the determinants of market liquidity in the FX market we take into account a variable related to market uncertainty, namely global FX implied volatility ([Copeland and Galai, 1983](#)). Our approach is empirical in line with [Chordia et al. \(2001\)](#).

Our paper is related to a recent paper by [Mancini et al. \(2013\)](#) which identifies a negative relationship between the VIX, a proxy for financial uncertainty, and the TED spread, an indicator of funding liquidity constraints, and FX market liquidity for the most traded currencies during the recent financial crisis. However, our paper investigates the impact of not only supply but also demand side factors of FX market illiquidity. Our broad data set of 20 currencies from both developed and emerging markets over

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