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Asset return dynamics and the FX risk premium in a decentralized dealer market☆

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Abstract

The paper proposes a continuous time model of an FX market organized as a multiple dealership. The dealers have costly access to best available quotes. They interpret signals from the joint dealer–customer order flow and decide upon their own quotes and trades in the inter-dealer market. Each dealer uses the observed order flow to improve the subjective estimates of relevant aggregate variables, which are the sources of uncertainty. The risk factors are returns on domestic and foreign assets and the size of the cross-border dealer transactions in the FX market. These uncertainties have diffusion form and are dealt with according to the principles of portfolio optimization in continuous time. The model is used to explain the country, or risk, premium in the uncovered national return parity equation for the exchange rate. The two country premium terms that I identify in excess of the usual covariance term (consequence of the "Jensen inequality effect") are: the dealer heterogeneity-induced inter-dealer market order flow component and the dealer Bayesian learning component. As a result, an "order flow-adjusted total return parity" formula links the excess FX return to both the "fundamental" factors represented by the differential of the national asset returns, and the microstructural factors represented by heterogeneous dealer knowledge of the aggregate order flow and the fundamentals.

JEL classification: F31; G11; G29; D49; D82

Keywords: FX microstructure; Optimizing dealer; Diffusion uncertainty; Uncovered parity

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1. Introduction[1]

The paper develops a continuous time model of the currency pricing in an inter-dealer FX market and derives consequences for the risk premium structure in the formula for uncovered parity of national asset returns. It is an asset pricing model with an additionally imposed decentralized dealer market organization. The economy defined in the paper is closer to the reality of FX and many other security markets than the standard asset pricing paradigm. A continuous time, diffusion uncertainty set-up has been chosen for its better analytical tractability compared to discrete time models. I demonstrate that the forex microstructure has an impact on the dynamics of the risk premium, by linking the behavior of the latter to

(1) the order flow received by dealers–domestic residents from other market users,
(2) errors in the dealers' assessments of the aggregate cross-border order flow and economic fundamentals.

The model is a formalized tool for the study of general mechanisms jointly driving the FX return and other asset returns in a decentralized dealership market, with the stress on the effects that cannot be captured by a representative agent Walrasian market approach. The methodological message is twofold.

First, the model demonstrates that in a decentralized dealer market, the rate of return on every asset satisfies a consumption-based CAPM formula adjusted for the statistics of the aggregate order flow between the selling and the purchasing part of the market users (dealers and non-dealers). If, in addition, the market makers do not know the parameters of the risk processes exactly, the CCAPM-correcting term contains the subjective estimation error of the said aggregate order flow. This, with minor modifications, is applicable to any asset market made simultaneously by multiple dealers outside an organized exchange, such as many bond markets.

Second, the model delivers a specific result for the FX market with the same organization. It shows that the FX return and returns on any two assets denominated in different currencies satisfy an uncovered parity condition in which the FX risk premium depends on the statistics of the aggregate order flow between the selling and the purchasing part of the market users. If the market makers do not know the parameters of the risk processes exactly, the risk premium contains the subjective estimation error of the aggregate order flow. Since for internationally traded currency pairs, the forex has the character of a decentralized dealership, with some, but not all, trades executed through brokers, this result is applicable quite generally.

This paper focuses on the FX market, for which the existence of the above-mentioned generalized uncovered parity theorem allows one to reduce the number of unobservable variables in the pricing formulae and get closer to empirically verifiable results. Namely, it is possible to express the price of foreign currency in this model, as of any other asset, through the marginal utilities (analogously to the standard

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