



The uncovered interest rate parity anomaly and trading activity by non-dealer financial firms

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ABSTRACT

Since the 1990s there has been a substantial increase in foreign exchange market trading by non-dealer financial firms. Non-dealer financial firms comprise a market segment that includes hedge funds and mutual funds, among others. We investigate whether the growth of non-dealer financial firm trading affected the uncovered interest rate parity (UIP) anomaly, a phenomenon that seems to offer opportunities for excess returns. We find that the growth in trading volume by non-dealer financial firms is associated with some mitigation in the UIP anomaly. In contrast, growth in dealer-to-dealer and dealer-to-nonfinancial firm trading volume has no impact on the anomaly.

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1. Introduction

Uncovered interest rate parity (UIP) holds when the expected appreciation in the foreign currency equals the difference between the domestic interest rate and the foreign interest rate. UIP is often empirically evaluated by regressing the change in the exchange rate against the domestic-less-foreign interest rate differential and testing whether the estimated slope coefficient on the interest rate differential (often referred to as β in the literature, and so referred to here) is equal to one. The UIP ‘anomaly’ or ‘puzzle’ refers to the long-standing empirical finding that the estimated β coefficients in UIP regressions are usually less than one and are often negative.¹ The failure of UIP to hold is considered an anomaly because it seems to imply that there are available ongoing excess returns to an investment strategy of holding assets denominated in high-interest-rate currencies funded through borrowing in low-interest-rate currencies.²

One explanation advanced for the failure of UIP to hold empirically is that there is incomplete or only gradual exploitation of excess return opportunities because of market frictions. These frictions could include insufficient capital invested in foreign currency trading strategies, lack of market liquidity or high costs of executing foreign exchange trading strategies.³ For example,

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¹ There are many empirical studies that report negative UIP slope coefficients. Representative findings are in Flood and Rose (2002), Burnside, Eichenbaum, and Rebelo (2009) and Bekaert and Hodrick (2012). In his review of the UIP literature, Sarno (2005) concludes that “the negative value of β is the central feature of the forward bias puzzle” (p. 676).

² Sercu, Vandebroek, and Xueping (2008), Burnside, Eichenbaum, and Rebelo (2007), Darvas (2009) and Hochradi and Wagner (2010) empirically evaluate the ongoing profitability of trading strategies that attempt to exploit the UIP anomaly.

³ Burnside (2009) provides a concise assessment of the efficacy of the different approaches in explaining the UIP anomaly.

Lyons (2001) argued that there is a lack of speculative capital available (given alternative investments) to quickly exploit deviations from UIP. Brunnermeier, Nagel, and Pedersen (2009) argue that liquidity constraints are a key friction causing slow adjustment to the interest rate differential. A friction-based explanation that we think bears most closely on our empirical study is that of Bacchetta and Van Wincoop (2010). In the Bacchetta and Van Wincoop setup, a gradual response of the exchange rate to a change in the interest rate differential is due to infrequent foreign exchange portfolio trading by market participants. Trading is rationally infrequent in their model because the exogenous costs associated with active management of the foreign asset component of the investor's portfolio can outweigh the expected gain. Regardless of the source of market frictions, the obvious empirical implication of friction-based explanations is that as these various frictions are mitigated, we should also see some mitigation of the UIP anomaly.

An important institutional change in the foreign exchange (FX) markets since the early 1990s has been the rising volume of FX market turnover by non-dealer financial firms (NDDFs).⁴ NDDF trading is that undertaken by mutual funds, pension funds, hedge funds, smaller non-dealer banks, retail order aggregators and sovereign wealth funds.⁵ NDDFs were a counterparty in less than 13% of foreign exchange market turnover in 1992 (in the six major currency pairs we study) but were a counterparty in almost one-half of all turnover in these currencies by 2010.⁶

Panel A of Fig. 1 shows the growth in the combined volume of turnover due to NDDFs and for non-NDDF market participants for six currency pairs.⁷ Panel B shows the ratio of NDDF turnover to total turnover for this set of currency pairs. Panel A documents that while both NDDF and non-NDDF trading grew over the sample period, NDDF trading grew much more rapidly, almost overtaking non-NDDF trading by 2010. Only during the 2007–2008 financial market crisis did NDDF (and non-NDDF) trading volume decline. Reflecting the relatively rapid growth in NDDF trading, panel B shows that the ratio of NDDF to total turnover increases steadily over this period reaching 46% of total turnover by 2010. In contrast to absolute volume of trading, the relative volume of NDDF trading continued to grow even through the financial market crisis.

The motivation for investigating the relation between the UIP anomaly and the growth in NDDF is driven by two observations made about NDDF trading. First, the NDDF market segment contains entities more likely to pursue active trading strategies designed to exploit perceived profit opportunities. Barker (2007, p. 6) refers to the NDDF participants as the “professional trading community.” Rime and Schrimpf (2013, p. 31) in their analysis of FX market participants conclude that “The most significant non-bank FX market participants [in the NDDF segment] are professional asset management firms...” In contrast, there is empirical evidence that traditional currency dealers focus their trading activities on market making and do not take speculative positions. Ammer and Brunner (1997) and Mende and Menkhoff (2006) find that dealer profits are almost exclusively due to market-making transactions, rather than to positions in currencies. Bjornes and Rime (2005) find that foreign exchange dealers rigorously control their inventories on an intraday basis and avoid even overnight uncovered positions.

The second reason that the rise of NDDFs is of special interest is that the growth in NDDF trading is closely associated with the spread of electronic trading (ET) in the FX markets. Electronic trading involves linking an electronic trading platform to one or more electronic communications networks to provide clients with real-time bid-ask quotes and immediate execution of trades. ET provided two important improvements in foreign exchange trading, particularly for non-dealers. First, ET gave dealers and prime brokers the capability to greatly improve the quality of service to clients in terms of speed and convenience of trade execution. Second, ET gave non-dealer traders access to bid-ask price spreads that were previously only available in the interdealer market, thus reducing transaction costs for this class of traders.⁸ As described by King and Rime (2010) and Galati and Heath (2007), the availability of ET greatly increased both the absolute amount of trading volume and the relative importance of foreign exchange market trading of NDDFs by lowering transaction costs and increasing the ease of foreign exchange market trading.⁹

Since the UIP anomaly implies the existence of unexploited profit opportunities, the expansion of NDDF trading may reflect the increased application of trading strategies designed to exploit such opportunities. If trading against the UIP anomaly is significant and successful, a by-product would be a moderation in the anomaly itself. Therefore our research strategy is to empirically analyze the relation between the growth in NDDF-counterparty turnover and the response of exchange rates to changes in the interest rate differential (i.e. β).

While there are a large number of empirical studies that test (and reject) UIP, one strand of UIP empirical research (discussed in Section 3.2 below) has focused on variables that may cause variation in the value of β over time. Our research contributes to this latter literature in two ways. Our paper is the first to investigate how trend changes in the type of market participant may impact the value of β over time. In addition, our paper brings in other variables from the time-varying β literature, previously

⁴ FX market turnover is the total value of trades over a given period of time. In this paper we use the terms ‘turnover’ and ‘trading volume’ interchangeably.

⁵ Official central bank transactions are also included but contribute only marginally to total NDDF trading volume (Rime and Schrimpf 2013).

⁶ The currency pairs are the Canadian dollar, British pound, Swiss franc, Australian dollar, Japanese yen and euro against the U.S. dollar. Turnover volume is the average daily U.S. dollar value of foreign exchange transactions. Turnover data are from the Bank for International Settlements (BIS) and regional foreign exchange committee surveys of the foreign exchange market. We discuss these surveys in more detail in the data section of the paper.

⁷ Non-NDDF turnover volume is the sum of interdealer trading in which dealers are the counterparty on both sides of the transaction, plus trading by non-financial firms with dealers.

⁸ Barker (2007) and Gallardo and Heath (2009) provide a more detailed discussion of the effects of ET in compressing bid-ask spreads, reducing deal size and improving the convenience and speed of retail trading.

⁹ King and Rime (2010) summarize the relation between ET and the growth in NDDF trading as: “[The] important structural change enabling increased FX trading by [NDDFs] is the spread of electronic execution methods. Electronic trading and electronic brokering are transforming FX markets by reducing transactions costs and increasing market liquidity. These changes in turn are encouraging greater participation across [NDDF] customer types.” p. 29.

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