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Intraday technical trading in the foreign exchange market

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Abstract

This paper examines the out-of-sample performance of intraday technical trading strategies selected using two methodologies, a genetic program and an optimized linear forecasting model. When realistic transaction costs and trading hours are taken into account, we find no evidence of excess returns to the trading rules derived with either methodology. Thus, our results are consistent with market efficiency. We do find, however, that the trading rules discover some remarkably stable patterns in the data.

JEL classification: F31; G15

Keywords: Technical analysis; Trading rule; Genetic programming; Exchange rate; High frequency

1. Introduction

There has been a recent resurgence of academic interest in the claims of technical analysis. This development is largely attributable to accumulating evidence that technical trading can be profitable over long time horizons. However, academic investigation of technical trading in the foreign exchange market has not been consistent with the practice of technical analysis. Most technical traders transact at high frequency and aim to finish the trading day with a net open position of zero. But, due to data limitations, most academic studies have evaluated the profitability of trading

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strategies on daily or weekly data (Dooley and Shafer, 1983; Sweeney, 1986; Levich and Thomas, 1993; Neely et al., 1997). These papers find that trading rules earn significant excess returns, net of transaction costs, which cannot be easily explained as compensation for bearing risk. The trading frequency for the rules studied in these papers typically ranges from 3 to 26 trades per annum. Evidently, these are not the trading strategies being used by the foreign exchange dealers surveyed by Taylor and Allen (1992), Cheung and Chinn (2000) and Cheung et al. (2000). These studies document the fact that technical analysis is widely used for trading at the shortest time horizons, namely, days and weeks, and that its use may be increasing.

But, despite their practical importance, there has been relatively little study of high-frequency trading rules. Goodhart and Curcio (1992) consider the usefulness of support and resistance levels published by Reuters. Osler (2000) looks at support and resistance levels published by six firms over 1996–1998 and finds significant evidence of power to predict intraday trend reversals. But she does not investigate whether it is possible to trade profitably on the basis of the signals net of transaction costs. Osler (Federal Reserve Bank of New York, unpublished, 2001) examines the potential importance of conditional orders for exchange rate dynamics and technical analysis. Acar and Lequeux (Banque Nationale de Paris, London Branch, unpublished, 1995) examine the profitability of a class of linear forecasting rules fitted to a sample of half-hourly data, whereas Curcio et al. (1997) examine the performance of filter rules that have been identified by practitioners. None of these papers finds evidence of profit opportunities. Pictet et al. (Olsen & Associates, unpublished, 1996) employ a genetic algorithm to optimize a class of exponential moving average rules. They run into serious problems of overfitting, and their rules perform poorly out-of-sample. Gençay et al. (Olsen & Associates, unpublished, 1998) report 3.6–9.6% annual excess returns, net of transaction costs, to proprietary real-time Olsen and Associates trading models using seven years of exchange rate data at a 5-minute frequency. It is difficult to compare other results with theirs, given that their models are not publicly available.

This paper follows trading practice more closely than most past research by investigating the performance of trading rules using high-frequency data that allow the rules to change position within the trading day[1]. We examine the performance of the trading rules to measure market efficiency, an approach first advocated in Brock et al. (1992), rather than to find profitable rules, per se. We use an in-sample period to search for ex ante optimal trading rules and then assess the performance of those rules out-of-sample. Two distinct methodologies are employed: the first is a genetic program that can search over a very wide class of (possibly nonlinear) trading rules; the second consists of linear forecasting models, which provide natural benchmarks against which to compare the genetic programming results. The analysis does not specify the type of trader who might use such rules, but does assume that

[1] Of course, the papers discussed above—Goodhart and Curcio (1992), Osler (unpublished, 2001), Acar and Lequeux (unpublished, 1995), Curcio et al. (1997), Pictet et al. (unpublished, 1996) and Gençay et al. (unpublished, 1998)—do permit intraday trading of one form or another.