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Exchange rate expectations of chartists and fundamentalists

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ABSTRACT

This paper provides novel evidence on exchange rate expectations of both chartists and fundamentalists separately. These groups indeed form expectations differently. Chartists change their expectations more often; however, all professionals' expectations vary considerably as they generally follow strong exchange rate trends. In line with non-linear exchange rate-modeling, professionals expect mean reversion only if exchange rates deviate strongly from PPP. Chartists survive in currency markets since they forecast just as accurately as fundamentalists. Unexpectedly from an efficient market viewpoint, chartists even outperform fundamentalists at short horizons. Overall, these findings clearly support the chartist–fundamentalist approach.

1. Introduction

There is ample research on the way exchange rate expectations are formed, stimulated in particular by Frankel and Froot (1987). There is also a great number of studies systematically documenting characteristics of chartists and fundamentalists in foreign exchange, starting with Taylor and Allen (1992). However, up until now there has been no direct evidence combining these two strands of literature: How do professionals, who tell us that they are chartists or fundamentalists, each form their exchange rate expectations?

This is an important question from at least three perspectives. First, the so-called chartist–fundamentalist models of exchange rates make assumptions about the behavior of these two groups (e.g. Frankel and Froot, 1990; De Grauwe and Grimaldi, 2006; Manzan and Westerhoff, 2007). We examine whether chartists and fundamentalists really behave as they are assumed to do in this line of research. Second, models of heterogeneous agents have been shown to be able to replicate the characteristics of unstable financial markets (Day and Huang, 1990; Farmer and Joshi, 2002). These models argue that instability arises from the expectation formation of a non-fundamentally-oriented group of traders, a notion which corresponds to our group of chartists. Hence, we examine whether the decision making of this group contributes to financial instability. Third, the existence of various groups in financial markets implicitly assumes that all these groups operate successfully in the long run. In this respect, the efficient market hypothesis states that chartism-inspired behavior will not be competitive in the longer run (Fama, 1991). To complement the abundance of studies testing the profitability of

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hypothetical chartist trading rules (e.g. Park and Irwin, 2007; Neely et al., 2010), we examine whether actual expectations of chartists provide a basis for profitable trading strategies to the same degree as expectations of fundamentalists.

All examinations presented here are the first to systematically connect information about individual exchange rate expectations with the respective professionals' preferred kind of information, i.e. charts or fundamentals. This connection enables us to directly test the real world behavior of chartists and fundamentalists, and thus to complement existing indirect evidence derived from simulation studies (e.g. Föllmer et al., 2005; Tramontana et al., 2010), experiments (Sonnemans et al., 2004) or explanations of forecast dispersion (Jongen et al., 2012). Our findings clearly support the common core of the chartist–fundamentalist models: forecasters who rely heavily on charts do indeed form exchange rate expectations more in line with trends than fundamentalists and they reinforce existing trends, which may destabilize foreign exchange markets. Finally, challenging the efficient market hypothesis (Fama, 1991, 1998), chartist behavior is individually rational as these forecasts are at least as good as those of the peer group.

This study is based on the Financial Market Survey conducted on a monthly basis by the Centre for European Economic Research (ZEW) in Mannheim, Germany, on several hundred professional forecasters. This survey regularly asks professionals about their individual US-dollar/Euro expectations, starting in January 1999. We combine these answers with information about the respective individuals' self-assessment of the use of charts and fundamentals, which has been carried out three times, in 2004, 2007 and 2011. Overall, our sample comprises almost 400 forecasters which provide an unbalanced panel with more than 30,000 observations over up to 153 months, up to and including September 2011. We classify forecasters into the categories of chartists, fundamentalists, and a third one, which we call intermediates.

Our study makes use of these data in three steps, analyzing actual forecasting behavior, forecasting dynamics and forecasting performance: (1) Regarding forecasting behavior, we test the revealed behavior of chartists and fundamentalists, as inspired by chartist–fundamentalist models. In line with earlier literature (e.g. Menkhoff and Taylor, 2007), we use the terms of charts and technical analysis as synonyms. We find that chartists tend to follow trends more often than fundamentalists. (2) Regarding forecasting dynamics, chartists tend to revise the direction of their exchange rate forecasts more frequently than fundamentalists, confirming a standard assumption in heterogeneous agents' models (e.g. Brock and Hommes, 1998; Farmer and Joshi, 2002). The choice of forecasting tools is influenced by recent experience: when exchange rates exhibit trends, the professionals (chartists and fundamentalists) tend to switch toward chartism; in contrast, the professionals move away from chartism when the exchange rate deviates substantially from its longer-term average (the purchasing power parity, PPP). (3) Regarding forecasting performance, professionals, such as chartists, will only survive in competitive foreign exchange markets if they perform well. We find that chartists are indeed equally good forecasters as fundamentalists. When differentiating between forecasting horizons, chartists perform relatively better at shorter horizons, whereas fundamentalists are at least as good at longer horizons. This fits well with the chartists' (fundamentalists') preference for short (long) horizons (Taylor and Allen, 1992).

All these findings correspond to the core assumptions of chartist–fundamentalist models or with the stylized facts about expectation formation and the use of charts and fundamentals, respectively. Detailed references to this literature are discussed in the following section. In this sense, we provide supportive evidence complementing earlier approaches, which often relied on indirect tests. On closer examination, however, we also obtain evidence that is less conclusive regarding some specific assumptions. The most important issue in this respect seems to be our intuition that the switching between chartism and fundamentalism is largely an opportunistic shift of weight that forecasters give to these tools (different from De Grauwe and Grimaldi, 2006; Manzan and Westerhoff, 2007), whereas their general preferences for either charts or fundamentals seem to be quite stable over time. Moreover, chartists are neither less profitable than fundamentalists as modeled by Day and Huang (1990), nor more profitable as modeled by De Grauwe and Grimaldi (2006, p. 29), and switching between strategies is not related to exchange rate volatility (De Grauwe and Grimaldi, 2006, p. 29).

The paper is structured as follows: Section 2 briefly discusses relevant literature in order to embed our study in earlier work and to carve out our own contribution. Section 3 reports the comprehensive dataset. Section 4 presents results of our research in several steps (Sections 4.1–4.3), Section 5 contains robustness tests. Conclusions are drawn in Section 6.

2. Literature and hypotheses

This section shows the relation of our research to three strands of earlier literature, of which we can only cover a selection. There are studies which have influenced and shaped the *chartist–fundamentalist models*. More generally, studies modeling the interaction of *heterogeneous agents* often focus on the forecasting dynamics of groups, which may lead to price instability. Finally, our work is related to studies about the *performance* of chartist and fundamentalist trading.

Chartist–fundamentalist models: These models have been stimulated by observations which motivate to model foreign exchange markets where both, chartists and fundamentalists, co-exist and interact (Frankel and Froot, 1990, subsequently refined by De Grauwe and Grimaldi (2006).[1] The basic idea is that there are these two groups in the market who follow different investment

[1] Standard economic models with representative agents cannot adequately explain exchange rate formation (e.g. Meese and Rogoff, 1983; Cheung et al., 2005). Empirically, there is a high degree of heterogeneity among foreign exchange professionals, as found by Frankel and Froot (1990) or Ito (1990) and later reconfirmed by, e.g. MacDonald and Marsh (1996). A crucial characteristic of heterogeneity is the formation of exchange rates following bandwagon expectations over short horizons and regressive expectations over longer horizons (Frankel and Froot, 1987). This finding already contains the core ingredient of chartist–fundamentalist models, i.e. the co-existence of trend-following and mean-reverting expectations (for a survey, see Jongen et al., 2008), for non-linear extensions see (e.g. Menkhoff et al., 2008; Reitz et al., 2012). Finally, dealers say that they use primarily charts at shorter horizons and