ESSAYS ON EXPECTATIONS IN FINANCIAL MARKETS

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Kurzfassung

Diese Dissertation besteht aus vier Essays und behandelt unterschiedliche Fragestellungen aus der Finanzmarktforschung. Ihr liegt dabei die Überzeugung zugrunde, dass eine sorgfältige Analyse *individueller Erwartungen* dazu beitragen kann, vieldiskutierte offene Fragen zu beantworten und ökonomische Mechanismen besser zu verstehen. In jedem einzelnen Essay wird daher auf umfragebasierte Erwartungsdaten zurückgegriffen, um Themen aus verschiedenen Literaturbereichen zu erörtern: die Zinserwartungshypothese, das Wechselkurs-Prognose-Problem, Heterogene Agenten in Währungsmärkten und die Beziehung zwischen Aktien- und Währungsmärkten. Das erste Essay untersucht, wodurch Erwartungen bezüglich Veränderungen der Risikoprämien bei langfristigen Anleihen bestimmt werden. Auch wird herausgearbeitet, dass diese Erwartungen nachfolgende Renditen an Anleihemärkten prognostizieren können. Im zweiten Essay werden die beobachteten Erwartungen als Prognosen interpretiert. Die Hauptidee ist es hierbei, die Vorhersagegenauigkeit bezüglich unterschiedlicher Variablen miteinander zu verbinden, um Zusammenhänge zwischen den Realisationen dieser Variablen aufzudecken. Im dritten Essay werden die Erwartungen auf die zugrunde liegenden Strategien heterogener Agenten zurückgeführt, wodurch die Merkmale der sich gegenüberstehenden Konzepte Chartanalyse und Fundamentalanalyse dokumentiert werden können. Schließlich werden im vierten Essay Erwartungen dazu benutzt, die Phasen zu bestimmen, in denen Finanzmärkte durch jene Mechanismen angetrieben werden, die ein spezifisches Modell unterstellt.

Schlagworte: Individuelle Erwartungen, Finanzmärkte, Umfragedaten.

Abstract

This doctoral thesis collects four essays on several phenomena in financial markets which are motivated by the conviction that a thorough analysis of *individual expectations* can shed light on economic puzzles and mechanisms that are intensively investigated in literature yet poorly understood. Hence, in each of these essays, we use survey data to address issues from different strands of literature: the expectations hypothesis of interest rates, the exchange rate forecasting puzzle, heterogeneous agents in the market for foreign exchange and the relation between equity markets and exchange rates. In the first essay, we analyze the determinants of expectations about changes in term premia, and we illustrate that these expectations predict subsequent returns in bond markets. In the second essay, we take the observed expectations as forecasts of future financial variables. The core idea of this essay is to connect forecast performance for different macroeconomic variables, which helps to uncover links between the realizations of these variables. In the third essay, we employ expectations in a way that they reflect individual strategies of heterogeneous agents, which allows us to document the features of chartism and fundamentalism as two opposing concepts. Finally, in the fourth essay, we use expectations to determine regimes in which financial markets are driven by the mechanisms implied in one specific model.

Key words: Individual Expectations, Financial Markets, Survey Data.

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Introduction

This thesis collects four essays on several phenomena in financial markets. These essays are all motivated by the conviction that a thorough analysis of *individual expectations* can shed light on economic puzzles and mechanisms that are intensively investigated in literature yet poorly understood. Accordingly, the conceptual framework chosen for all topics in this thesis is the empirical analysis of economic expectations taken from *survey data*. Based on this approach, we study problems from different strands of literature, such as the expectations hypothesis of interest rates, the exchange rate forecasting puzzle, heterogeneous agents in the market for foreign exchange and the relation between equity markets and exchange rates.

There are different approaches to uncovering economic relations by looking at survey data. In particular, the nature of survey-expectations allows the extraction of information according to several interpretation schemes: expectations contain *additional information* about the state of the economy (beyond observable fundamentals), they can be interpreted and evaluated as *forecasts*, they reflect *strategies by individual agents* to conceptualize reality and can thus be used to trace back these strategies, and they may inform about the *current regime* when several economic mechanisms alternate. In the following, we assume that all of these interpretations are valid, and make use of the various facets of expectations in different manners throughout the four chapters.

In the first chapter, the expectations from survey data are considered representing additional insights about the fundamental state of economy which go beyond observable macroeconomic information; consequently, we analyze what determines these expectations, and we illustrate that they affect (subsequent returns in) financial markets. In the second chapter, we take the observed expectations as forecasts of future financial variables. The core idea of that chapter is to con-

nect forecast performance for different macroeconomic variables, which helps to uncover links between the realizations of these variables. In the third chapter, we employ expectations in a way that they reflect individual strategies of heterogeneous agents, which allows us to document the features of chartism and fundamentalism as two opposing concepts. Finally, in the fourth chapter, we use expectations for determining regimes in which financial markets are driven by the mechanisms implied in one specific model, and others that are dominated by further mechanisms.

The first chapter of this thesis is motivated by the failure of the expectations hypothesis of interest rates, which has been documented by, e.g., Fama and Bliss (1987), Campbell and Shiller (1991) or, more recently, Cochrane and Piazzesi (2005).[1] It has been shown by these authors, among others, that term premia in bond markets (and correspondingly, excess returns of holding bonds) are time-varying and predictable. We contribute to this literature by highlighting that expectations contain information which can be used for predicting time-varying risk premia. More specifically, we suggest a measure of expected changes in term premia on long-term bonds which can be obtained in real-time from survey data. Based on the individual forecasts collected in the Survey of Professional Forecasters, we analyze how this proxy for expected term premium changes relates to further macroeconomic expectations. We also investigate whether measures of aggregate macroeconomic uncertainty influence our proxy. We demonstrate that expected changes in term premia are not only time-varying, but also determined by other macroeconomic forecasts. Moreover, the expectations contain information about excess returns in bond markets. To sum up the key results, the expected term premia are determined by expectations about real GDP growth, and they are affected by both output growth uncertainty and inflation uncertainty. Interestingly, it transpires that expectations about real macroeconomic variables have a stronger influence than inflation expectations. We also relate our proxy to the conventional term structure factors level,

[1] A revised version of this chapter with the title *Macro Expectations, Aggregate Uncertainty, and Expected Term Premia* (which is joint work with Maik Schmeling and Andreas Schrimpf) is accepted for publication in the *European Economic Review* (see Dick, Schmeling, and Schrimpf (2012)).

slope, and curvature. It appears that the level and the slope factor reflect information which is also contained in the considered uncertainty measures; in contrast, curvature captures similar information as our proxy for expected changes in term premia. When aggregating the individual expectations about term premium changes, this measure is able to predict excess returns in bond markets over the subsequent twelve months.

In the second chapter of this thesis, we use expectations for deepening our understanding of actual (realized, not expected) movements in financial markets, more precisely, the market for foreign exchange.[2] Our choice of this market is motivated by the well-documented *exchange rate forecasting puzzle*, i.e., the empirical failure of theoretical exchange rate models to outperform random walk forecast at intermediate horizons (e.g., Meese and Rogoff, 1983; Cheung, Chinn, and Garcia-Pascual, 2005, among others.) This result presents a puzzle, as it does not only put into question the usefulness of exchange rate models, but even the connection between exchange rates and fundamentals as such. Thus, we reconsider the link between exchange rates and their theoretical macroeconomic fundamentals in the medium-term by the means of an indirect approach, which centers around observed expectations and hence avoids shortcomings of conventional strategies. Our analysis gives reason to believe that exchange rates are indeed related to economic fundamentals over medium-term horizons, such as a month or longer. In particular, by using a large panel of individual professionals' forecasts, we are able to document that the quality of exchange rate forecasts and a sound understanding of macroeconomic fundamental variables (i.e., interest rate forecasts) are closely related. This result is also confirmed when we apply regression techniques with individual fixed effects and when we take further control variables into consideration. The relationship between exchange rates and fundamentals is variably important over time, and we demonstrate that it is more pronounced in market phases when fundamental

[2]This chapter is an earlier version of joint work with Lukas Menkhoff and Ronald MacDonald. An even earlier version has appeared as a discussion paper entitled *Individual Exchange Rate Forecasts and Expected Fundamentals* (henceforth Dick, MacDonald, and Menkhoff, 2011).

misalignments are obvious. This is the case when the price of a currency strongly deviates from a fundamental price, when the interest rates in the two countries are substantially different, and when exchange rates are exposed to little momentum trading. We also document that exchange rate forecasters share a common exchange rate model, but that they are only able to use it for accurate exchange rate forecasts when they rely on good interest rates forecasts.

The third chapter of this thesis is devoted to an investigation of the expectations of different types of forecasters.[3] For more than two decades, there are serious attempts in financial economics to abandon the representative agent framework and to model expectations for different agents heterogeneously instead. Early papers introducing this idea include De Long, Shleifer, Summers, and Waldmann (1990), who demonstrate how irrational (either bullish or bearish) agents introduce additional risk, or Day and Huang (1990), who distinguish between sophisticated investors and naive (and thus purely trend-following) investors in stock markets, or Brock and Hommes (1997), who simulate the dynamics of heterogeneous traders switching between trend-following or a fundamental-based decision rules. Our particular analysis follows this line of thought, focusing on the expectations of chartists and fundamentalists in foreign exchange markets. We document that these two groups differ from each other with respect to their expectation formation. It can be seen that chartists switch more often between forecast directions than fundamentalists. As a matter of fact, the expectations of chartists and fundamentalists vary to a substantial extent, as they tend to react to pronounced exchange rate trends. Our results also correspond to nonlinear exchange rate models as we show that forecasters make mean-reverting forecasts only in phases in which exchange rates differ substantially from their fundamental values. We also investigate the forecast performance of chartists and fundamentalists. We learn that both groups predict equally accurately. This finding explains why chartists are not systematically less prof-

[3]The chapter is an earlier version of a joint work with Lukas Menkhoff with the title *Exchange Rate Expectations of Chartists and Fundamentalists*. It has also appeared as a discussion paper, see Dick and Menkhoff (2012).

itable than fundamentalists, and hence, are also able to remain active in financial markets. The details of our findings could potentially inform exchange rate models with heterogeneous agents, such as Frankel and Froot (1990), De Grauwe and Grimaldi (2006) or Bauer, De Grauwe, and Reitz (2009).

The fourth chapter of this thesis investigates the connection between exchange rate movements, capital flows, and stock market returns. This research follows a line of studies focusing on the role of financial investors (rather than agents in real markets) in exchange rate determination. Hau and Rey (2006) illustrate a concept called *uncovered equity parity*, according to which exchange rates, capital flows, and stock market returns are determined endogenously; specifically, differential stock market returns cause portfolio rebalancing, which is ultimately responsible for the appreciation or depreciation of currencies. Our research follows this line of reasoning and puts into focus investor's expectations, in particular with respect to the implicitly expected correlation between exchange rate movements and relative stock market returns. These expectations are found to be time-varying, which should have implications for portfolio allocation decisions. Based on the time variation in expectations, we are able to identify different regimes. Furthermore, we illustrate that the magnitude of *realized* correlation between exchange rate movements and relative stock returns depends on such regimes. This finding is consistent with the view that exchange rates are partly determined by portfolio rebalancing, as suggested by Hau and Rey (2006), but that there are also additional mechanisms outside of that model. Hence, our expectation measure can be used for distinguishing different regimes in the market for foreign exchange with different dominating mechanisms.