Fundamental Exchange Rate Forecasting Models Advantages

The first chapter presents the estimated trajectory for the US FEER over the period from 1967Q1 to 1994Q4. The estimated trajectory is shown to outperform the random walk in medium-term and long-term forecasting. The second chapter considers bilateral exchange rates. The equilibrium exchange rate trajectories are estimated for 3 pairs of countries: UK-US, Japan-US and Canada-US. These trajectories are compared to the random walk in forecasting real exchange rates and found to be superior in medium-and long-run. In the third chapter, FEER is compared to the equilibrium exchange rates estimates derived from reduced-form equations: Natural Real Exchange Rate (NATREX), and Behavioral Equilibrium Exchange Rate (BEER). It is shown that the medium and long-term forecasts based on the FEER and NATREX models are more accurate than the point predictions of the random walk. The BEER model, however, can beat the random walk only if the actual realized values of the fundamentals are used in forecasting.

"This paper attacks the Meese-Rogoff puzzle from a different perspective: out-of-sample interval forecasting. Most studies in the literature focus on point forecasts. In this paper, we apply Robust Semiparametric (RS) interval forecasting to a group of Taylor rule models. Forecast intervals for twelve OECD exchange rates are generated and modified tests of Giacomini and White (2006) are conducted to compare the performance of Taylor rule models and the random walk. Our contribution is twofold. First, we find that in general, Taylor rule models generate tighter forecast intervals than the random walk, given that their intervals cover out-of-sample exchange rate realizations equally well. This result is more pronounced at longer horizons. Our results suggest a connection between exchange rates and economic fundamentals: economic variables contain information useful in forecasting the distributions of exchange rates. The benchmark Taylor rule model is also found to perform better than the monetary and PPP models. Second, the inference framework proposed in this paper for forecast-interval evaluation can be applied in a broader context, such as inflation forecasting, not just to the models and interval forecasting methods used in this paper"--Page [2].

Praise for Handbook of Exchange Rates "This book is remarkable. I expect it to become theanchor reference for people working in the foreign exchangefield." —Richard K. Lyons, Dean and Professor of Finance,Haas School of Business, University of CaliforniaBerkeley "It is quite easily the most wide ranging treaty ofexpertise on the forex market I have ever come across. I will bekeeping a copy close to my fingertips." —Jim O'Neill, Chairman, Goldman Sachs AssetManagement How should we evaluate the forecasting power of models? What areappropriate loss functions for major market participants? Is theexchange rate the only means of adjustment? Handbook of ExchangeRates answers these questions and many more, equipping readerswith the relevant concepts and policies for working intoday's international economic climate. Featuring contributions written by leading specialists from theglobal financial arena, this handbook provides a collection oforiginal ideas on foreign exchange (FX) rates in four succinctsections: • Overview introduces the history of the FX marketand exchange rate regimes, discussing key instruments in thetrading environment as well as macro and micro approaches to FXdetermination. • Exchange Rate Models and Methods focuses onforecasting exchange rates, featuring methodological contributionson the statistical methods for evaluating forecast performance,parity relationships, fair value models, and flow–basedmodels. • FX Markets and Products outlines active currencymanagement, currency hedging, hedge accounting; high frequency andalgorithmic trading in FX; and FX strategy-based products. • FX Markets and Policy explores the currentpolicies in place in global markets and presents a framework foranalyzing financial crises. Throughout the book, topics are explored in-depth alongsidetheir founding principles. Each chapter uses real-world examplesfrom the financial industry and concludes with a summary thatoutlines key points and concepts. Handbook of Exchange Rates is an essential reference forfund managers and investors as well as practitioners andresearchers working in finance, banking, business, andeconometrics. The book also serves as a valuable supplement forcourses on economics, business, and international finance at theupper-undergraduate and graduate levels.

Previous assessments of nominal exchange rate determination have focused upon a narrow set of models typically of the 1970's vintage. The canonical papers in this literature are by Meese and Rogoff (1983, 1988), who examined monetary and portfolio balance models. Succeeding works by Mark (1995) and Chinn and Meese (1995) focused on similar models. In this paper we re-assess exchange rate prediction using a wider set of models that have been proposed in the last decade: interest rate parity, productivity based models, and behavioral equilibrium exchange rate' models. The performance of these models is compared against a benchmark model the Dornbusch-Frankel sticky price monetary model. The models are estimated in error correction and first-difference specifications. Rather than estimating the cointegrating vector over the entire sample and treating it as part of the ex ante information set as is commonly done in the literature, we recursively update the cointegrating vector, thereby generating true ex ante forecasts. We examine model performance at various forecast horizons (1 quarter, 4 quarters, 20 quarters) using differing metrics (mean squared error, direction of change), as well as the consistency' test of Cheung and Chinn (1998). No model consistently outperforms a random walk, by a mean squared error measure; however, along a direction-of-change dimension, certain structural models do outperform a random walk with statistical significance. Moreover, one finds that these forecasts are cointegrated with the actual values of exchange rates, although in a large number of cases, the elasticity of the forecasts with respect to the actual values is different from unity. Overall, model/specification/currency combinations that work well in one period will not necessarily work well in another period.

We survey the literature on the two main views of exchange rate determination that have evolved since the early 1970s: the monetary approach to the exchange rate (in flex-price, sticky-price and real interest differential formulations) and the portfolio balance approach. We then go on to discuss the extant empirical evidence on these models and conclude by discussing how the future research strategy in the area of exchange rate determination is likely to develop. We also discuss the literature on foreign exchange market efficiency, on exchange rates and 'news' and on international parity conditions.

The medium-term predictability of exchange rate movements is examined using three models of fundamentals: purchasing power parity, the monetary model, and uncovered interest parity. While the first two approaches yield favorable in-sample results, these largely reflect finite-sample estimation biases. Adjusting for these biases, there is little evidence of predictability, consistent with the lack of systematic improvement in out-of-sample forecasting performance relative to a random walk. Uncovered interest parity fares better at long horizons, but reflects information already embodied in market prices; in this sense, it may not be useful as an indicator of exchange rate misalignment. While more elaborate models of fundamentals might have better medium-term forecasting properties, careful attention must be paid to finite-sample biases in assessing predictability.

Still after more than thirty years of free floating exchange rates, large parts of exchange rate dynamics remain a puzzle. As this book shows, much progress has been made in explaining exchange rate movements over longer horizons. It also shows, however, that short-run movements are far more challenging to explain. The book is based upon a variety of papers, many of them released recently. A key aspiration of the literature has always been not only to explain past exchange rate behavior but also to forecast out of sample and to compare it to the simple random walk outcome. Here some development has been made after Meese and Rogoff's (1983) truculent verdict of the performance of common exchange rate models. By means of empirical analysis and descriptive statistics this book further supports the established long-run relationships between exchange rates and fundamentals such as expected productivity growth, real GDP growth, domestic investment, interest rates, inflation, government spending, and current account balances. It finds that these fundamentals affect the exchange rate to varying degrees over time. Turning to short-term exchange rate dynamics, it turns out that a different set of forces is at

play. The key to explaining short-run movements is to be found in an extensive micro-foundation that factors in a pronounced heterogeneity among market participants and information asymmetries, as well as the possibility of sudden shifts in sentiment, beliefs, and the degree of risk aversion. Promising results have been obtained by order-flow analysis and high frequency data. Also, the consideration of chartism and speculators facilitates understanding for otherwise puzzling exchange rate movements. The last attempt to tackle the understanding of exchange rate behavior is the use of frequency domain analysis and in particular spectral analysis which tries to track down any cyclical patterns in the various moments of time series. And as we shall see forex indeed incorpor

We survey the empirical literature on floating nominal exchange rates over the past decade. Exchange rates are difficult to forecast at short- to medium-term horizons. There is a bit of explanatory power to monetary models such as the Dornbusch 'overshooting' theory, in the form of reaction to 'news' and in forecasts at long-run horizons. Nevertheless, at short horizons, a driftless random walk characterizes exchange rates better than standard models based on observable macroeconomic fundamentals. Unexplained large shocks to floating rates must then, logically, be due either to innovations in unobservable fundamentals, or to non-fundamental factors such as speculative bubbles. The observed difference in exchange rate and macroeconomic volatility under different nominal exchange rate regimes makes us skeptical of the first view. The theory and evidence on speculative bubbles, however, is not conclusive. We conclude with the hope that promising new studies of the microstructure of the foreign exchange market might eventually rise to insights into these phenomena.

This text explains the methods and aspects of exchange rate forecasting, including purchasing power, parity, interest rate differentials and technical analysis. Guidelines for reducing risk with forecasting strategies are included, as are techniques for co

It is a well known fact that a naive random walk generates better exchange rate forecasts than economic models. The exchange rate is episodically unstable and the switching nature is inconsistent with a linear representation. However, empirical evidence in favour of non-linear models such as regime switching models, neural networks or non-parametric ones is weak. The present paper adopts an econometric method, which incorporates dynamic model averaging (DMA) and selection (DMS). The DMA / DMS framework adds additionally layers of flexibility by allowing parameters as well as the entire forecasting model to evolve over time. In addition this paper takes a different approach by forecasting exchange rates at a daily frequency. Thereby financial data is used as a proxy for macro-economic fundamentals and technical indicators are included in the set of potential predictor variables. The paper shows strong empirical evidence in favour of the employed model in the period before the bankruptcy of Lehman Brothers. During the financial crisis predictability in terms of the mean squared forecast error breaks down. The time-varying evolution of fundamental and technical forecasts allows investigating the evolution of the influence of two types of agents (fundamentalists and chartists) believed to operate in the foreign exchange market.

This paper presents a behavioral finance model of the exchange rate. Agents forecast the exchange rate by means of very simple rules. They can choose between three groups of forecasting rules: fundamentalist, extrapolative and momentum rules. Agents using a fundamentalist rule are not able to observe the true value of the fundamental exchange and therefore have to rely on an estimate of this variable to make a forecast. Based on simulation analysis we find that two types of equilibria exist, a fundamental and a non-fundamental one. Both the probability of finding a particular type of equilibrium and the probability of switching between different types of equilibria depend on the number of rules available to agents. Furthermore, we find that the exchange rate dynamics is sensitive to initial conditions and to the risk perception about the underlying fundamental. Both results are dependent on the number of forecasting rules.

The thesis explores the predictability of five currency pair rates, the Euro, the US dollar, the British pound, the Canadian dollar and the Japanese yen, each of which are expressed against the Swiss franc. The motive is to demonstrate the superior forecasting ability of the LSTM neural network against more classical approaches. The predictors considered in the fundamental analysis are the inflation differential, the interest rates differential, the money supply and output differential. In the technical analysis, the focus is on the ARMA and VAR models. The performance of the fundamental and technical models serves as a base to evaluate the usefulness of the LSTM in exchange rates forecasting. It is common knowledge that exchange rates are very difficult to forecast. The LSTM implemented produces lower root mean squared error than the fundamental or technical models. However, none of the selected models can convincingly outperform the random walk without drift in out-of-sample forecast. Therefore, the results of the thesis are congruent with the exchange rates literature. Nevertheless, this does not necessarily validate the random walk hypothesis for the five currency pairs. There is evidence in the literature that exchange rates typically present non-linear predictable patterns.

These notes draw from the Theory of Cointegration in order to test the monetary model of exchange rate determination. Previous evidence shows that the monetary model does not capture the short run dynamics of the exchange rate, specially when assessed in terms of forecasting accuracy. Even though the monetary equations of exchange rate determination may be bad indicators of how exchange rates are determined in the short run, they couldstill describe long run equilibrium relationships between the exchange rate and its fundamentals. Stationary deviations from those long run relationships are allowed in the short run. This book also addresses severalissues on Cointegration. Chapter 6 studies the small sample distribution of the likelihood ratio test statistics (on the dimension and restrictions on the cointegrating space) under deviations from normality. This monograph also focuses on the issue of optimal prediction in partially nonstationary multivariate time series models. In particular, it caries out an exchange rate prediction exercise.

This paper summarizes the methods and types of indicators that are often employed, both insid and outside the IMF, to assess whether exchange rates are broadly in line with economic fundamentals.

Models and Strategies for Exchange Rate ForecastingMichael R. RosenbergGetting an accurate exchange rate is critical for any company doing business in today's global economy.

Exchange Rate Determination--written by the number one-ranked foreign exchange team in the world--examines the methods used to accurately and profitably forecast foreign exchange rates. This hands-on guidebook uses extensive charts and tables to examine currency option markets, productivity trends and exchange rates; technical analysis methods to improve currency forecasting accuracy; and more.

Increasing economic globalization has made understanding the world economy more important than ever. From trade agreements to offshore outsourcing to foreign aid, this two-volume encyclopedia explains the key elements of the world economy and provides a first step to further research for students and scholars in public policy, international studies, business, and the

broader social sciences, as well as for economic policy professionals. Written by an international team of contributors, this comprehensive reference includes more than 300 up-to-date entries covering a wide range of topics in international trade, finance, production, and economic development. These topics include concepts and principles, models and theory, institutions and agreements, policies and instruments, analysis and tools, and sectors and special issues. Each entry includes cross-references and a list of sources for further reading and research. Complete with an index and a table of contents that groups entries by topic, The Princeton Encyclopedia of the World Economy is an essential resource for anyone who needs to better understand the global economy. Features: ? More than 300 alphabetically arranged articles on topics in international trade, finance, production, and economic development International team of contributors Annotated list of further reading with each article Topical list of entries Full index and cross-references Entry categories and sample topics: ? Concepts and principles: globalization, anti-globalization, fair trade, foreign direct investment, international migration, economic development, multinational enterprises Models and theory: Heckscher-Ohlin model, internalization theory, New Trade Theory, North-South trade, Triffin dilemma Institutions and agreements: European Union, International Monetary Fund, World Trade Organization, World Bank, Doha Round, international investment agreements Policies and instruments: dollar standard, international aid, sanctions, tariffs Analysis and tools: exchange rate forecasting, effective protection, monetary policy rules Sectors and special issues: child labor, corporate governance, the digital divide, health and globalization, illegal drugs trade, petroleum, steel

Seminar paper from the year 2004 in the subject Economics - Monetary theory and policy, grade: High Destinction (1), The University of Sydney, 8 entries in the bibliography, language: English, abstract: The essay addresses the topic of exchange rate movements and their explanation. Four different theoretical approaches are therefore taken into consideration, namely The Monetary Fundamentals approach, the Macroeconomic Balance approach, the Dispersed Information or Microstructure approach and the approach of explaining exchange rate movements by dealers. The essay outlines each approach and its assumptions briefly and evaluates the underlying time horizon, short-, medium- or long-term horizon, of each model. Furthermore the four approaches of exchange rate analysis are put into contrast. Finally all approaches are evaluated in spite of their individual strengths and weaknesses and linked to each other.

Research limitations -- A limitation that could have biased the results is that the return of EUR/USD, JPY/USD, GBP/USD and CHF/USD exchange rates was calculated based on the daily exchange rate. In fact, using intra-day volatility measurement could have led to better results in forecasting exchange rate volatility. Moreover, other models could have been used that exhibit different characteristics than GARCH (1, 1), EGARCH, GJR GARCH and EWMA models such as the Autoregressive Integrated Moving Average (ARIMA), the Integrated in Variance (IGARCH) and the Fractionally Integrated Generalized Autoregressive Conditional Heteroskedasticity (FIGARCH). In addition, other software could have replace EViews, such as Matlab. Practical implications -- The empirical results of this research have direct and fundamental implication on international investors and firms to better hedge currency risk. The findings will also assist policy makers in the international capital budgeting by understanding the pattern of exchange rates. Originality/value -- This study is an endeavor to fill the gap of previous literature by implementing the symmetric and asymmetric models to forecast the exchange rate volatility. In addition, it compares the performance of implied volatility to financial models, a topic that was ignored in previous researches. Moreover, no recent papers tackled the in-sample and out-of-sample EUR/USD, JPY/USD, GBP/USD and CHF/USD exchange rate volatility under a recent sample period and using this basket of models: GARCH (1, 1), EGARCH, GJR GARCH and EWMA. Therefore, the findings of this research will be used as a benchmark for investors, hedges, economists and financial institutions to accurately predict exchange rate volatility.

This thesis is the combination of three papers on carry trade strategies and exchange rate forecasting. The rst paper evaluates the performance of carry trade strategies with implied Taylor rule interest rate di erentials and compares their performance statistics to the naive carry trade strategy with actual interest rates. I argue that the crash risk is reduced with implied Taylor rule interest rate di erentials as a trading strategy in Yen and Franc trades for the whole sample period. During the recent nancial crisis, the carry trading strategies with an implied Taylor rule interest rate perform best in terms of mean returns, risk adjusted returns and downside risk. The second paper evaluates the performance of carry trade strategies with Taylor rule fundamentals in a Markov switching dynamic factor augmented regression framework and compares the performance statistics with the benchmark model of a random walk. I make simulations with the Japanese Yen, Swiss Franc and US Dollar as funding currencies against six target currencies. I argue that risk adjusted returns, mean returns and down-side risk perform best when the Taylor rule is used in a regime switching factor augmented regression framework for Yen and Dollar trades. The results are robust to di erent time periods. In the third paper, I estimate a dynamic factor from the risk premium of bilateral US Dollar against 15 OECD countries, and augment macro fundamentals suggested by Taylor rule, monetary and purchasing power parity models with that factor. I nd evidence of short term predictability of bilateral exchange rates between 1991 and 2012 with factor augmented macro fundamentals.

We explore whether modelling parameter time variation improves the point, interval and density forecasts of nine major exchange rates vis-a-vis the US dollar over the period 1976-2015. We find that modelling parameter time variation is needed for an accurate calibration of forecast confidence intervals, and is better suited at long horizons and in high-volatility periods. The biggest forecast improvements are obtained by modelling time variation in the volatilities of the innovations, rather than in the slope parameters. We do not find evidence that parameter time variation helps to unravel exchange rate predictability by macroeconomic fundamentals. However, an economic evaluation of the different forecast models reveals that controlling for parameter time variation and macroeconomic fundamentals leads to higher portfolio returns, and to higher utility values for investors.

Are foreign exchange markets efficient? Are fundamentals important for predicting exchange rate movements? What is the signal-to-ratio of high frequency exchange rate changes? Is it possible to define a measure of the equilibrium exchange rate that is useful from an assessment perspective? The book is a selective survey of current thinking on key topics in exchange rate economics, supplemented throughout by new empirical evidence. The focus is on the use of advanced econometric tools to find answers to these and other questions which are important to practitioners, policy-makers and academic economists. In addition, the book addresses more technical econometric considerations such as the importance of the choice between single-equation and system-wide approaches to modelling the exchange rate, and the reduced form versus structural equation problems. Readers will gain both a comprehensive overview of the way macroeconomists approach exchange rate modelling, and an understanding of how advanced techniques can help them explain and predict the behavior of this crucial economic variable. Since Meese and Rogoff (1983) results showed that no model could outperform a random walk in predicting exchange rates. Many papers have tried to find a forecasting methodology that could beat the

random walk, at least for certain forecasting periods. This Element compares the Purchasing Power Parity, the Uncovered Interest Rate, the Sticky Price, the Bayesian Model Averaging, and the Bayesian Vector Autoregression models to the random walk benchmark in forecasting exchange rates between most South American currencies and the US Dollar, and between the Paraguayan Guarani and the Brazilian Real and the Argentinian Peso. Forecasts are evaluated under the criteria of Root Mean Square Error, Direction of Change, and the Diebold-Mariano statistic. The results indicate that the two Bayesian models have greater forecasting power and that there is little evidence in favor of using the other three fundamentals models, except Purchasing Power Parity at longer forecasting horizons.

"This paper compares the true, ex-ante forecasting performance of a micro-based model against both a standard macro model and a random walk. In contrast to existing literature, which is focused on longer horizon forecasting, we examine forecasting over horizons from one day to one month (the one-month horizon being where micro and macro analysis begin to overlap). Over our 3-year forecasting sample, we find that the micro-based model consistently out-performs both the random walk and the macro model. Micro-based forecasts account for almost 16 per cent of the sample variance in monthly spot rate changes. These results provide a level of empirical validation as yet unattained by other models. Our result that the micro-based model out-performs the macro model does not imply that macro fundamentals will never explain exchange rates. Quite the contrary, our findings are in fact consistent with the view that the principal driver of exchange rates is standard macro fundamentals. In Evans and Lyons (2004b)we report firm evidence that the non-public information that we exploit here for forecasting exchange rates is also useful for forecasting macro fundamentals themselves"--NBER website

In this paper we evaluate the predictive power of the three most popular equilibrium exchange rate concepts: Purchasing Power Parity (PPP), Behavioral Equilibrium Exchange Rate (BEER) and the Macroeconomic Balance (MB) approach. We show that there is a clear trade-off between storytelling and forecast accuracy. The PPP model offers little economic insights, but has good predictive power. The BEER framework, which links exchange rates to fundamentals, does not deliver forecasts of better quality than PPP. The MB approach has the most appealing economic interpretation, but performs poorly in forecasting terms. Sensitivity analysis confirms that changing the composition of fundamentals in the BEER model or modifying key underlying assumptions in the MB model does not generally enhance their predictive power.

This is a literature review on exchange rate modeling. This is taken from my doctoral dissertation (My copyright registration number: TX 8-435-669). This may be helpful if you're seeking information on exchange rate, interest rates, gross domestic product, inflation, and money supply. It may also be helpful in understanding the origins of the sticky-price monetary model.

Currency ForecastingA Guide to Fundamental and Technical Models of Exchange Rate DeterminationIrwin Professional Pub

The paper presents new empirical results that elucidate the dynamics of the foreign exchange market. The first half of the paper is an updated study of the exchange rate expectations held by market participants, as reflected in responses to surveys, and contains the following conclusions. First, the bias observed in the forward discount as a predictor of the future spot rate is not attributable to an exchange risk premium, as is conventionally believed. Second, at short horizons forecasters tend to extrapolate recent trends, while at long horizons they tend to forecast a reversal. Third, the bias in expectations is robust in the samples, based on eight years of data across five currencies. The second half of the paper abandons the framework in which all market participants share the same forecast, to focus on the importance of heterogeneous expectations. Tests suggest that dispersion of opinion, as reflected in the standard deviation across respondents in the survey, affects the volume of trading in the market, and, in turn, the degree of volatility of the exchange rate. An example of how conflicting forecasts can lead to swings in the exchange rate is the model of "chartists and fundamentalists." The market weights assigned to the two models fluctuate over time in response to recent developments, leading to fluctuations in the demand for foreign currency. The paper ends with one piece of evidence to support the model: the fraction of foreign exchange forecasting services that use "technical analysis" did indeed increase sharply during 1983-85, but declined subsequently

"We show analytically that in a rational expectations present value model, an asset price manifests near random walk behavior if fundamentals are I(1) and the factor for discounting future fundamentals is near one. We argue that this result helps explain the well known puzzle that fundamental variables such as relative money supplies, outputs, inflation and interest rates provide little help in predicting changes in floating exchange rates. As well, we show that the data do exhibit a related link suggested by standard models - that the exchange rate helps predict these fundamentals. The implication is that exchange rates and fundamentals are linked in a way that is broadly consistent with asset pricing models of the exchange rate"--NBER website

How successful is PPP, and its extension in the monetary model, as a measure of the equilibrium exchange rate? What are the determinants and dynamics of equilibrium real exchange rates? How can misalignments be measured, and what are their causes? What are the effects of specific policies upon the equilibrium exchange rate? The answers to these questions are important to academic theorists, policymakers, international bankers and investment fund managers. This volume encompasses all of the competing views of equilibrium exchange rate determination, from PPP, through other reduced form models, to the macroeconomic balance approach. This volume is essentially empirical: what do we know about exchange rates? The different econometric and theoretical approaches taken by the various authors in this volume lead to mutually consistent conclusions. This consistency gives us confidence that significant progress has been made in understanding what are the fundamental determinants of exchange rates and what are the forces operating to bring them back in line with the fundamentals.

The main goal of this article is to provide an answer to the question: "Does anything forecast exchange rates, and if so, which variables?". It is well known that exchange rate fluctuations are very difficult to predict using economic models, and that a random walk forecasts exchange rates better than any economic model (the Meese and Rogoff puzzle). However, the recent literature has identified a series of fundamentals/methodologies that claim to have resolved the puzzle. This article provides a critical review of the recent literature on exchange rate forecasting and illustrates the new methodologies and fundamentals that have been recently proposed in an up-to-date, thorough empirical analysis. Overall, our analysis of the literature and the data suggests that the answer to the question: "Are exchange rates predictable?" is, "It depends" on the choice of predictor, forecast horizon, sample period, model, and forecast evaluation method. Predictability is most apparent when one or more of the following hold: the predictors are Taylor rule or net foreign assets, the model is linear, and a small number of parameters are estimated. The toughest benchmark is the random walk without drift.

Standard models of exchange rates, based on macroeconomic variables such as prices, interest rates, output, etc., are thought by many researchers to have failed empirically. We present evidence to the contrary. First, we emphasize the point that "beating a random walk" in forecasting is too strong a criterion for accepting an exchange rate model. Typically models should have low forecasting power of this type. We then propose a number of alternative ways to evaluate models. We examine in-sample fit, but emphasize the importance of the monetary policy rule, and its effects on expectations, in determining exchange rates. Next we present evidence that exchange rates incorporate news about future macroeconomic fundamentals, as the models imply. We demonstrate that the models might well be able to account for observed exchange-rate volatility. We discuss studies that examine the response of exchange rates to announcements of economic data. Then we present estimates of exchange-rate models in which expected present values of fundamentals are calculated from survey forecasts. Finally, we show that out-of-sample forecasting power of models can be increased by focusing on panel estimation and long-horizon forecasts.

We address whether transaction flows in foreign exchange markets convey fundamental information. Our GE model includes fundamental information that first manifests at the micro level and is not

symmetrically observed by all agents. This produces foreign exchange transactions that play a central role in information aggregation, providing testable links between transaction flows, exchange rates, and future fundamentals. We test these links using data on all end-user currency trades received at Citibank over 6.5 years, a sample sufficiently long to analyze real-time forecasts at the quarterly horizon. The predictions are borne out in four empirical findings that define this paper's main contribution: (1) transaction flows forecast future macro variables such as output growth, money growth, and inflation, (2) transaction flows forecast these macro variables significantly better than the exchange rate does, (3) transaction flows (proprietary) forecast future exchange rates, and (4) the forecasted part of fundamentals is better at explaining exchange rates than standard measured fundamentals.

This paper presents a method to test the volatility predictions of the textbook asset-pricing exchange rate model, which imposes minimal structure on the data and does not commit to a choice of exchange rate "fundamentals." Our method builds on existing tests of excess volatility in asset prices, combining them with a procedure that extracts unobservable fundamentals from survey-based exchange rate expectations. We apply our method to data for the three major exchange rates since 1984 and find broad evidence of excess exchange rate volatility with respect to the predictions of the canonical asset-pricing model in an efficient market.

This book provides an alternative view of the workings of foreign exchange markets. The authors' modeling approach is based on the idea that agents use simple forecasting rules and switch to those rules that have been shown to be the most profitable in the past. This selection mechanism is based on trial and error and is probably the best possible strategy in an uncertain world, the authors contend. It creates a rich dynamic in the foreign exchange markets and can generate bubbles and crashes. Sensitivity to initial conditions is a pervasive force in De Grauwe and Grimaldi's model. It explains why large exchange-rate changes and volatility clustering occur. It also has important implications for understanding how the news affects the exchange rate. De Grauwe and Grimaldi conclude that news in fundamentals has an unpredictable effect on the exchange rate. Sometimes, they maintain, it alters the exchange rate considerably; at other times it has no effectwhatsoever. The authors also use their model to analyze the effects of official interventions in the foreign exchange market. They show that simple intervention rules of the "leaning-against-the-wind" variety can be effective in eliminating bubbles and crashes in the exchange rate. They further demonstrate how, quite paradoxically, by intervening in the foreign exchange market the central bank makes the market look more efficient. Clear and comprehensive, The Exchange Rate in a Behavioral Finance Framework is a must-have for analysts in foreign exchange markets as well as students of international finance and economics.

This dissertation consists of four papers that investigate long-standing issues in international finance, macroeconomics and international macroeconomics. The common theme of the papers is the fact that each uses novel statistical methods to forecast or evaluate outcomes in international macroeconomics and macroeconomics. The first two papers focus on the predictability of nominal exchange rates and the profitability of foreign exchange speculation. The first chapter of my dissertation investigates the predictability of nominal exchange rates. Prediction of the exchange rate has long interested economic researchers. A model able to accurately forecast exchange rate movements would have important implications for economic theory and market participants alike. However, it is a stylized fact that empirical models of the exchange rate cannot produce forecasts that are more accurate than those of a random walk-- the well-known Meese-Rogoff puzzle. In this chapter, I apply the gradient boosting method due to Hastie, Tibshirani & Friedman (2000) to the problem of forecasting exchange rate movements for nine major currencies relative to the U.S. dollar. The method performs model selection and builds flexible, potentially non-linear models of the exchange rate. I find that the economic fundamentals I consider do contain predictive power at both short and long horizons. The key to successfully forecasting exchange rates is building the 'correct' forecasting model, because I find that model with the greatest explanatory power varies across currencies and across time for any individual currency. At short horizons the method I use is unable to select ex ante a model of the exchange rate that convincingly outperforms a random walk. However, when forecasting 12 months ahead, boosted models produce extremely accurate forecasts of the exchange rate, easily besting the random walk null. Chapter two, written with Òscar Jordà and Alan M. Taylor, explores the profitability of currency speculation. We document the actions of a hypothetical trader who trades based on forecasts of nominal exchange rates coming from standard forecasting models. Although the efficient markets hypothesis implies that such a trade would yield zero profits on average, these actions would have delivered economically meaningful profits to the trader. That currency carry trades are on average profitable is well-known. The literature accounts for these profits by noting that realized returns exhibit conditional negative skewness, or by presuming that the profits compensate for some other risk. Yet when the trader uses our preferred model of the exchange rate, the ensuing profits exhibit little to no conditional skewness. Intriguingly, we also find that the profits are not compensation for risk, as the excess returns from the carry trade do not covary in a meaningful way with a broad set of conventional risk factors. The final two papers of my thesis analyze the business cycle. The third chapter of my dissertation, written with Òscar Jordà, investigates the classification of economic activity in the U.S. into expansions and recessions. In the U.S., the Business Cycle Dating Committee (BCDC) of the NBER determines the peaks and troughs of the business cycle. But because there is no universally accepted definition of "recession, '' the true state of the economy is fundamentally unobservable and the problem of classifying economic data into the two phases of the business cycle is not a trivial undertaking. This chapter evaluates the classification skill of the BCDC relative to several state-of-the-art statistical methodologies designed to describe the unobservable state of the economy. The methods we use are novel to the economics literature and have the advantage of being completely non-parametric. In the final portion of the paper, we introduce a forecasting model to predict future states of the business cycle. The final chapter of my dissertation, written with Fushing Hsieh, Shu-Chun Chen and Òscar Jordà, concerns business cycles outside of the U.S. The existence of an apolitical, unbiased committee dedicated to determining business cycle peaks and troughs is a luxury that American economists take for granted-- only two other economies in the world have such a committee. In most countries, recessions are determined either by the popular press, who can use only rough rules-of-thumb, or by the government, so that such decisions are fraught with political influence. We classify international data into recessions and expansions for 22 OECD economies using a novel classification algorithm. The algorithm is completely non-parametric, a feature that is necessary to complete the analysis because the state-space of the problem makes standard classification methods unfeasible. The algorithm operates by recognizing intervals where economic activity is particularly intense, in the sense that the recurrence time between observations of extreme events (e.g., negative GDP growth) is shorter than would otherwise be expected. We apply the algorithm to monthly country-level data on industrial production, employment and GDP. The resulting binomial series are aggregated in order to produce novel chronologies of country-specific, regional, and global recessions.