

**Robert Schmidt**

# **The Behavioral Economics of Foreign Exchange Markets**

**A Psychological View  
on Human Expectation Formation  
in Foreign Exchange Markets**



**PETER LANG**  
Europäischer Verlag der Wissenschaften

# Contents

PREFACE .....	V
SYNOPSIS .....	VII
FIGURES .....	XV
TABLES .....	XVII
CHAPTER I INTRODUCTION.....	1
I.1    Aim.....	1
I.2    Organization of the study.....	3
CHAPTER II THE EXCHANGE RATE DISCONNECT PUZZLE.....	7
II.1    The 'modern' view on exchange rate modeling: the asset approach.....	8
II.1.1 Asset market theory of exchange rate determination .....	8
II.1.2 The role of expectations: rational expectations hypothesis .....	10
II.1.3 Efficient market hypothesis for foreign exchange markets.....	13
II.1.4 Important empirical implications of the asset market theory to exchange rate determination .....	16
II.2    The empirical validity of the asset market theory to exchange rate determination ..	20
II.2.1 On the relationship between macroeconomic fundamentals and exchange rate movements.....	20
II.2.1.1 Asset approach models: theoretical considerations.....	20
II.2.1.1.1 Monetary approach to exchange rate determination .....	20
II.2.1.1.1.1 Flexible price monetary models: the monetarist model.....	21
II.2.1.1.1.2 Sticky-price monetary models: the overshooting model .....	22
II.2.1.1.2 Portfolio-balance models.....	23
II.2.1.2 Empirical validity of the asset approach models .....	24
II.2.1.2.1 A selective survey of the existing literature .....	24
II.2.1.2.2 The link between macroeconomic fundamentals and the EUR/USD exchange rate.....	26

II.2.2	On the rationality of exchange rate expectations.....	30
II.2.2.1	Rational exchange rate expectations: a selective survey .....	31
II.2.2.2	Rationality of exchange rate expectations for the EUR/USD exchange rate.....	34
II.2.2.2.1	Data.....	34
II.2.2.2.2	Empirical results.....	35
II.2.3	On the link between exchange rate dynamics and 'news' .....	41
II.2.3.1	A selective survey of the existing literature.....	41
II.2.3.2	The link between macroeconomic 'news' and the EUR/USD exchange rate.....	45
II.2.3.2.1	Data.....	45
II.2.3.2.2	Empirical results.....	49
II.2.4	On the random walk behavior of exchange rates: an application of variance ratio tests.....	52
II.2.4.1	Random Walk behavior of exchange rates: a selective survey of the existing evidence .....	55
II.2.4.2	Empirical evidence against Random Walk behavior of DM/USD and YEN/USD exchange rates.....	56
II.2.4.2.1	Data.....	56
II.2.4.2.2	Empirical results.....	56
II.2.5	On exchange rate misalignments.....	60
II.3	Summary.....	66
CHAPTER III PATTERNS OF EXCHANGE RATE DYNAMICS AND THE ROLE OF SPECULATION..		69
III.1	Long swings of free floating exchange rates .....	70
III.1.1	Exchange rate trends according to technical analysis.....	70
III.1.2	Exchange rate trends according to variance ratio tests .....	72
III.1.3	Exchange rate trends according to Markov Switching regressions .....	80
III.1.3.1	Data and estimation procedure .....	80
III.1.3.2	Empirical results for DM/USD and YEN/USD exchange rates .....	84
III.2	Speculation in foreign exchange markets.....	90
III.2.1	Relevance of speculation in foreign exchange markets.....	92
III.2.2	The impact of speculation on foreign exchange rates .....	99
III.2.2.1	The case of stabilizing speculation.....	100
III.2.2.2	The case of destabilizing speculation .....	105
III.2.2.2.1	Noise trading and limits to arbitrage .....	106

III.2.2.2 Noise trading and destabilizing behaviors of rational speculators .....	110
III.2.3 Empirical evidence on the actual trading practice of foreign exchange traders .....	114
III.3 Keynes' view on the functioning of asset markets.....	120
III.3.1 The role of uncertainty in asset markets.....	121
III.3.2 Decision behavior under "true behavioral uncertainty".....	123
III.4 Summary.....	127
CHAPTER IV BEHAVIORAL ECONOMICS AS AN ALTERNATIVE APPROACH.....	129
IV.1 The traditional economic model of human behavior -- a critique .....	131
IV.1.1 The logical theory of rational choice under uncertainty.....	131
IV.1.2 Empirical evidence for the theory of rational choice.....	135
IV.2 The alternative concept of bounded rationality.....	138
IV.2.1 Herbert Simon on bounded rationality.....	139
IV.2.2 Different perspectives on bounded rationality in the literature.....	142
IV.2.2.1 Bounded rationality as optimization under constraints.....	142
IV.2.2.2 Bounded rationality as cognitive illusions .....	143
IV.2.2.3 Bounded rationality as ecological rationality .....	145
IV.2.3 Summary.....	147
IV.3 Behavioral decision theory: a psychological analysis of judgment and decision ....	147
IV.3.1 The psychological view of human decision behavior .....	148
IV.3.2 The relevance of heuristics in human decision making .....	152
IV.3.3 Behavioral economics and exchange rate movements.....	159
IV.4 Summary.....	162
CHAPTER V EXPERIMENTAL AND EMPIRICAL EVIDENCE .....	163
V.1 A systematic comparison of professional exchange rate expectations with experimental expectations of novices.....	164
V.1.1 Experimental design and data .....	166
V.1.2 Forecasting exchange rates in real world and experiments -- a comparison.....	169
V.1.2.1 Forecasting accuracy of professional exchange rate expectations.....	169
V.1.2.2 Forecasting accuracy of experimental exchange rate expectations.....	171
V.1.2.3 Summary .....	173
V.1.3 The nature of expectations.....	174

V.1.3.1	Rationality of experimental expectations .....	174
V.1.3.2	A common bias in expectation formation.....	179
V.1.3.3	Different expectation formation mechanisms? .....	184
V.1.3.3.1	Extrapolative expectations.....	186
V.1.3.3.2	Adaptive expectations.....	192
V.1.3.3.3	Regressive expectations.....	195
V.1.3.3.4	Discussion of the results .....	201
V.1.4	Summary.....	206
V.2	Expectation formation in an experimental foreign exchange market.....	207
V.2.1	Introduction.....	207
V.2.2	Design of the experimental foreign exchange market .....	208
V.2.3	Experimental results.....	211
V.2.3.1	Aggregated behavior of exchange rates in experimental foreign exchange markets .....	211
V.2.3.1.1	Similarity of experimental exchange rates.....	211
V.2.3.1.2	Efficiency of experimental foreign exchange markets.....	214
V.2.3.1.3	Summary.....	217
V.2.3.2	Individual behavior in experimental foreign exchange markets – the nature of expectations .....	217
V.2.3.2.1	Rationality of Individual Expectations .....	217
V.2.3.2.2	Overreaction.....	218
V.2.3.2.3	Individual expectation formation mechanisms.....	220
V.2.3.3	Keynes Beauty Contest – Coordinated Expectations?.....	221
V.2.4	Discussion of the experimental results.....	225
V.3	Technical analysis as a simple heuristic .....	228
V.3.1	Objectives and functioning of technical analysis .....	228
V.3.1.1	Philosophy of technical analysis.....	229
V.3.1.2	Examples of technical analysis .....	231
V.3.2	Profitability of technical trading rules .....	235
V.3.2.1	A selective survey of the existing literature.....	235
V.3.2.2	Empirical results for the DM/USD and Yen/USD exchange rate.....	238
V.3.2.2.1	Data.....	238
V.3.2.2.2	Implementation of the moving average trading rule .....	240
V.3.2.2.3	Profitability indicators for technical trading rule profits.....	243

V.4	Summary.....	249
CHAPTER VI CONCLUDING REMARKS .....		251
VI.1	Summary.....	251
VI.2	Outlook .....	253
CHAPTER VII APPENDICES.....		259
Appendix A: Estimation procedures.....		259
Appendix B: Asymmetric and time-varying impact of macroeconomic news on exchange rate movements.....		261
Appendix C: The special role of private information in foreign exchange trading .....		272
Appendix D: Measures for the forecasting accuracy.....		280
Appendix E: Instructions of the first experiment.....		282
Appendix F: Instructions of the second experiment .....		283
Appendix G: Regression results of the second experiment .....		286
REFERENCE LIST.....		299