1	The Traditional Approach to Finance						
1.1 Introduction							
	1.2 Rational Expectations Theory and the Efficient Market						
		Hypothesis	1				
	1.3	1.3 Pricing of Stock Markets and Excess Volatility					
	1.4						
	1.5	<u>-</u>					
	1.6 Have Your Cake and Eat It: Creating a Non-Markovitz Portfolio						
	1.7	Critics of the Traditional Viewpoint	21				
2	Beh	avioral Finance	25				
	2.1 Introduction						
	2.2	Cognitive Processes: The Individual Level	26				
		2.2.1 Motives	27				
		2.2.2 Emotions	28				
		2.2.3 Self-Structure	28				
		2.2.4 Biases	30				
	2.3	Prospect Theory	32				
	2.4 Pricing Stocks with Yardsticks and Sentiments		34				
		2.4.1 Introduction	35				
		2.4.2 Theory of Pricing Stocks by Yardsticks and Sentiments	36				
		2.4.3 Discussion	42				
	2.5	Sticky Price Dynamics: Anchoring and Other Irrational					
		Beliefs Used in Decision Making	42				
		2.5.1 Appendix: Quantitative Description					
		of the Trading Algorithm	49				
	2.6	'Man on the Moon' Experiments of Behavioral Finance	52				
	2.7	Social Processes Underlying Market Dynamics	53				
3	Fina	ancial Markets as Interacting Individuals: Price					
	mation from Models of Complexity	59					
	3.1 Introduction						
	3.2	Chaos Theory and Financial Markets	59				
	3.3	The Symphony of the Market	61				



	3.4	Agent-Based Modeling: Search for Universality Classes					
		in Finance	62				
	3.5	The El Farol Bar Game and the Minority Game	65				
	3.6	Some Results for the Minority Game	68				
	3.7	The \$-Game	71				
	3.8	A Scientific Approach to Finance	74				
	3.9	Taking the Temperature of the Market: Predicting Big					
		Price Swings	75				
4	A Psychological Galilean Principle for Price Movements:						
	Fun	damental Framework for Technical Analysis	77				
	4.1	Introduction	77				
	4.2	Dimensional Analysis	79				
	4.3	A Simple Quantitative Framework for Technical Analysis	81				
	4.4	Applications	85				
5	Catching Animal Spirits: Using Complexity Theory						
	to D	etect Speculative Moments of the Markets	93				
	5.1	Introduction	93				
	5.2	Rational Expectations Bubbles	94				
	5.3	Going Beyond Rational Expectations Bubbles	96				
	5.4	The Idea of Decoupling	99				
	5.5	The Formalism of Decoupling	101				
	5.6	Decoupling in Computer Simulations and in Real Market Data	103				
	5.7	Using Decoupling to Detect Speculative Price Movements	106				
		5.7.1 Monte Carlo Simulations Applied to \$G					
		Computer Simulations	107				
		5.7.2 Experiments on Human Subjects and Monte					
		Carlo Simulations Applied to Data Generated					
		by Human Traders	113				
		5.7.3 Experimental Manipulation	118				
	5.8	Summary	119				
6	Soci	ial Framing Creating Bull Markets of the Past: Growth					
	The	ory of Financial Markets	121				
	6.1	Introduction	121				
	6.2	The State of the Market	121				
	6.3	E	125				
	6.4	How Big Is the Investment Level of a Given Stock Market?	132				
	6.5	Impact of Short Selling on Pricing in Financial Markets	135				
7		nplexity Theory and Systemic Risk in the World's					
		ancial Markets	143				
	7.1	Introduction	143				
	7.2	Systemic Risk: Tearing a Piece of Paper Apart	144				
	7.3	Systemic Risk in Finance	147				
	7.4	Self-Organized Criticality	149				

Contents xiii

	7.5	Two States of the World's Financial Markets: The Sand				
		Pile a	nd the Quicksand	154		
		7.5.1	News and the Markets			
		7.5.2	Change Blindness and Large Market Movements	155		
		7.5.3	Price-Quakes of the Markets	156		
		7.5.4	Price-Quakes in the Worldwide Network			
			of Financial Markets	161		
		7.5.5	Discussion	163		
8	Communication and the Stock Market					
	8.1	Introd	uction	167		
	8.2	A Model of Communication and Its Impact on Market Prices				
9	Refe	erences		173		
In	dex			181		