

<<极端金融风险>>

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### 内容概要

In the financial sector , crashes probably represent the most striking events among all possible extreme phenomena , with an impact and frequency that has been increasing in the last two decades. Consider the worldwide crash in October 1987 which evaporated more than one thousand billion dollars in a few days or the more recent collapse of the internet bubble in which more than one-third of the world capitalization of 1999 disappeared after March 2000. Finance and stock markets are based on the fluid convertibility of stocks into money and vice versa. Thus , to work well , money is requested to be a reliable standard of value , that is , an effective store of value , hence the concerns with the negative impacts of inflation.

## 书籍目录

- 1 On the Origin of Risks and Extremes
  - 1.1 The Multidimensional Nature of Risk and Dependence
  - 1.2 How to Rank Risks Coherently?
    - 1.2.1 Coherent Measures of Risks
    - 1.2.2 Consistent Measures of Risks and Deviation Measures
    - 1.2.3 Examples of Consistent Measures of Risk
  - 1.3 Origin of Risk and Dependence
    - 1.3.1 The CAPM View
    - 1.3.2 The Arbitrage Pricing Theory (APT) and the Fama—French Factor Model
    - 1.3.3 The Efficient Market Hypothesis
    - 1.3.4 Emergence of Dependence Structures in the Stock Markets
    - 1.3.5 Large Risks in Complex Systems
  - Appendix
    - 1.A Why Do Higher Moments Allow US to Assess Larger Risks?
- 2 Marginal Distributions of Returns
  - 2.1 Motivations
  - 2.2 A Brief History of Return Distributions
    - 2.2.1 The Gaussian Paradigm
    - 2.2.2 Mechanisms for Power Laws in Finance
    - 2.2.3 Empirical Search for Power Law Tails and Possible Alternatives
  - 2.3 Constraints from Extreme Value Theory
    - 2.3.1 Main Theoretical Results on Extreme Value Theory
    - 2.3.2 Estimation of the Form Parameter and Slow Convergence to Limit Generalized Extreme Value (GEV) and Generalized Pareto (GPD) Distributions.
- 3 Notions of Copulas
- 4 Measures of Dependences
- 5 Description of Financial Dependences With Copulas
- 6 Measuring Extreme Dependences
- 7 Summary and Outlook
- References
- Index

## 章节摘录

1.3.5 Large Risks in Complex Systems      These calculations show that an endogenous small positive correlation between all stock-pairs gives rise to large eigenvalues which can then be associated with "market factors." It seems that earlier researches have promoted the other way around: existing market factors ( stock indices , news agencies , etc. ) introduce exogenous market impact which affect different stocks similarly , thereby introducing positive correlation and thus large eigenvalues. This is clear from the general formulation of ( linear ) factor models such as the CAPM , APT , and Fama-French approaches in which the returns of all stocks are regressed against the same set of factors. Actually , we propose that the two chains of cause and result may be intrinsically coupled: the correlation structure between stocks is a stable attractor of a self-organized dynamics with positive and negative feedbacks in which factors exist because correlations exist , and correlations exist because factors exist. It would suggest the development of dynamical factor models , in which agents form anticipations on correlations based on their calibration of the past behavior of the regression to factors , in order to study the possible types of attractors ( single or multiple equilibria ) in the correlation structure of stocks. This may cast new light on the major unsolved problem stated in the introduction of this chapter concerning the relationship between return and risks: perhaps , the concept of return as the remuneration of risk which is so fundamental in financial theory should be replaced by the concept of the emergence of the risk-return duality , in which their relationship can be negative or positive , depending upon circumstances that remain to be worked out. Moreover , simulations of complex self-organizing systems show that large fluctuations and extreme variations are the rule rather than the exception.      The complex system approach , which involves seeing interconnections and relationships , /i.e. , the whole picture as well as the component parts , is now-a-days pervasive in modern control of engineering devices and business management. A central property of a complex system is the possible occurrence of coherent large-scale collective behaviors with a very rich structure , resulting from the repeated non-linear interactions among its constituents: the whole turns out to be much more than the sum of its parts. Most complex systems around us do exhibit rare and sudden transitions that occur over time intervals that are short compared with the characteristic time scales of their posterior evolution. Such extreme events express more than anything else the underlying forces usually hidden by almost perfect balance and thus provide the potential for a better scientific understanding of complex systems. These crises have fundamental societal impacts and range from large natural catastrophes , catastrophic events of environmental degradation , to the failure of engineering structures , crashes in the stock market , social unrest leading to large-scale strikes and upheaval , economic drawdowns on national and global scales , regional power blackouts , traffic gridlocks , diseases and epidemics , etc. An outstanding scientific question is how such large-scale patterns of catastrophic nature might evolve from a series of interactions on the smallest and increasingly larger scales. In complex systems , it has been found that the organization of spatial and temporal correlations do not stem , in general , from a nucleation phase diffusing across the system. It results rather from a progressive and more global cooperative process occurring over the whole system by repetitive interactions , which is partially described by the distributed correlations at the origin of a large eigenvalue as described above. An instance would be the many occurrences of simultaneous scientific and technical discoveries signaling the global nature of the maturing process. Recent developments suggest that non-traditional approaches , based on the concepts and methods of statistical and nonlinear physics coupled with ideas and tools from computation intelligence could provide novel methods in complexity to direct the numerical resolution of more realistic models and the identification of relevant signatures of large and extreme risks. To address the challenge posed by the identification and modeling of such outliers , the available theoretical tools comprise in particular bifurcation and catastrophe theories , dynamical critical phenomena and the renormalization group , nonlinear dynamical systems , and the theory of partially ( spontaneously or not ) broken symmetries. This field of research is presently very active and is expected to advance significantly your understanding , quantification , and control of risks.      .....



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