

APPLICATIONS OF SCALING AND MULTIFRACTAL VARIABILITY TO DYNAMIC FINANCIAL ANALYSIS

Y. Lantsman

Guy Carpenter & Company, Inc.; Yakov.Lantsman@guycarp.com

Dynamic Financial Analysis (DFA) is broadly used as a very effective decision making tool in the operations, investment and capital management processes of the firm. The kernel of DFA consists of stochastic models representing a variety of risk factors historically classified into two groups: asset risks and liability risks. In previous work, the highly non-linear and extreme nature of some elements of liability risk (e.g., natural and man made catastrophes, insured property distribution, etc., of an insurance company) led to a successful use of the multifractal approach to model losses from hail and tornado events. In this paper we present more evidence of highly intermittent and scaling properties of DFA risks. The major object of investigation here is the group of asset risks: interest rates, foreign exchange, inflation, etc. The clear signs of long-term memory and heavy tails associated with stochastic behavior in finance suggest the presence of multifractal processes.