With hundreds of trillion of dollars of capital floating in the stock market, it is extremely important to understand market structures and dynamics. In this thesis, we studied the macroscopic and mesoscopic dynamics of financial markets from the econophysics point of view. We contributed methodological innovations that allowed us to make phenomenological discoveries that indicate some market crashes exhibit early warning signals. In this oral defence, I will first discuss (i) an unsupervised clustering method: the interaction-hierarchical clustering algorithm to obtain robust clusters of stocks with high intra-cluster homogeneity and high inter-cluster heterogeneity. Furthermore, by visualizing these robust clusters using the fusion-fission diagram, we observed that when approaching market crashes, the movements of stock prices become synchronized, causing most of stocks to merge into a giant cluster. This discovery points us to the fusion-fission processes in the market, which we can exploit to forecast market crashes. Secondly, (ii) the finite sample effects in statistical significance testing, which can lead us to sometimes underestimate the statistical significance of the fits and mistakenly reject plausible fits. We propose modifications and outline a procedure for curve fitting that accounts for these effects, allowing us to compare fits across different distributions and different sample sizes. This will benefit all disciplines fitting large data sets to several distribution functions, and use the best candidate to guide the development of theories and models.