Modeling financial sector tail risk, with application to the euro area

Abstract

We develop a novel high-dimensional non-Gaussian framework to infer joint and conditional measures of financial sector risk. For this setting we also derive a conditional law of large numbers which permits the computation of joint and conditional risk measures within seconds. Joint risk assessments are based on a dynamic multivariate skewed-t copula which accommodates asymmetries, heavy tails, as well as non-linear and time-varying dependence in asset values. We apply the modeling framework to assess the risk from multiple financial firm defaults in the euro area during the financial and sovereign debt crisis, and find unprecedented joint tail risks during 2011-12. Augmenting the model with additional explanatory variables helps to explain the systematic correlation dynamics.

Keywords: systemic risk; dynamic equicorrelation model; generalized hyperbolic distribution; law of large numbers; large portfolio approximation.

JEL classification: G21.