Financial traders’ network and Systemic risk spillover channels

Jaehak Hwang (j.hwang@bath.ac.uk)
Department of Economics, University of Bath

Abstract

This paper estimates financial network among 8 types of traders across 5 different capital markets, which are stock, stock derivative, bond, bond derivative, and foreign exchange derivative market. In order to overcome the limit of VAR and reflect real trading decision making procedures, expectation forecasting of traders’ net trading volume on next day is included in analyses. Expectation forecasting values are predicted with LSTM (Long Short Term Memory), one of the most popularly used machine learning method. In addition, the systemic risk spillover channels are investigated using network measures, 3-phased systemic risk spillover channels which is the link of the volatility of financial indexes, traders’ network measure and traders’ daily net trading volumes, are modeled. I find potential systemic risk spillover channels which are through influential traders and their trading volumes.

Introduction

2. Traders
   IND(individual), BAN(k), F(securities company), CIS(mutual fund), OTH(others)
   INS(insurance company), GOV(government), FDX(Foreign investors)
3. Markets
   SU(stock, KOSPI), SD(stock derivative, KOSPI 200 futures), BD(bond, KTB 20 futures), FXD/bond derivative, KRW/USD futures

Methodology

1. Gaussian kernel regression (nonlinear approach)

2. Expectation forecast : LSTM (Long Short Term Memory)

3. Granger causality Matrix (Cu) : trader xi’s influence on trader xj

4. Connectedness measure

5. Systemic risk spillover channels : 3-phased impulse response analysis

Conclusion and Discussion

1. Systemic risk in financial market can spillover through the network measures and trading activities of influential traders.
2. Foreign investors in local market are influential but they function in the direction that systemic risk decreases.

[Policy Suggestion]

1. Influential traders within the network structure can be the tool for market stabilization, if policy makers are well aware of their influence and the role in the market.
2. Imposing a restriction on the trading of positively reacting traders to the systemic, or incentivizing the traders who respond negatively, can be effective financial market stabilization policy.