Financial contagions

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Behavioural sciences explore the role of behaviour – human emotion and natural response – to what is happening in the market. It overcomes the paradigm of "rational investor", since both the perception of risk and the reaction are not any more necessarily driven by rational calculus, but to the intrinsic nature of human response. Another element of behavioural Sciences is "blindness to small changes" – the common behaviour to not react to small changes, but to overreact (and eventually panic) to large changes. The embedding of behavioural traits in panel data analysis allows to depict a frame which is more accurate than just regression analysis. Nonlinearity enters the model due to a behavioural attribute of humans reacting disproportionately to big changes. Actually, each market is considered as a unit providing non linear response, quite similar to a single artificial neuron cell, and all the markets act together as a system, which can be described as a set of coupled oscillators.

Aim of the project

The aim of the project is to validate the model on new data, and eventually to expand it on different markets/segments, comparing with other methods for classification and clustering. For instance, relevant questions are
Is the model suitable for understanding contagions?
Is the model suitable for getting early signals of the raise of bubbles due to behavioural responses?
Is the network of the most strong couplings relevant for understanding the closeness among markets, hence clustering?

Required mathematical/numerical background for the realisation of the project:

Standard mathematical Calculus, simulation of discrete dynamical processes, autonomy in coding in a computer programming language.

Main references

1. Vitting Andersen, Jorgen and Nowak, Andrzej and Rotundo, Giulia and Parrott, Lael, Tremor Price Dynamics in the World's Network of Stock Exchanges (December 18, 2009). Available at SSRN: https://ssrn.com/abstract=1525622 or http://dx.doi.org/10.2139/ssrn.1525622
2. Bellenzier, Lucia and Vitting Andersen, Jorgen and Rotundo, Giulia, Contagion in the World's Stock Exchanges Seen as a Set of Coupled Oscillators (August 24, 2015). Available at SSRN: https://ssrn.com/abstract=2650164 or http://dx.doi.org/10.2139/ssrn.2650164