

Econophysics: Can we identify states of the market?

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State of the market ?

„US central bank facing a **state of crisis** in the financial market.“

Can we quantify this ?

Can we **identify market states** ?

Can we study the **time evolution** ?

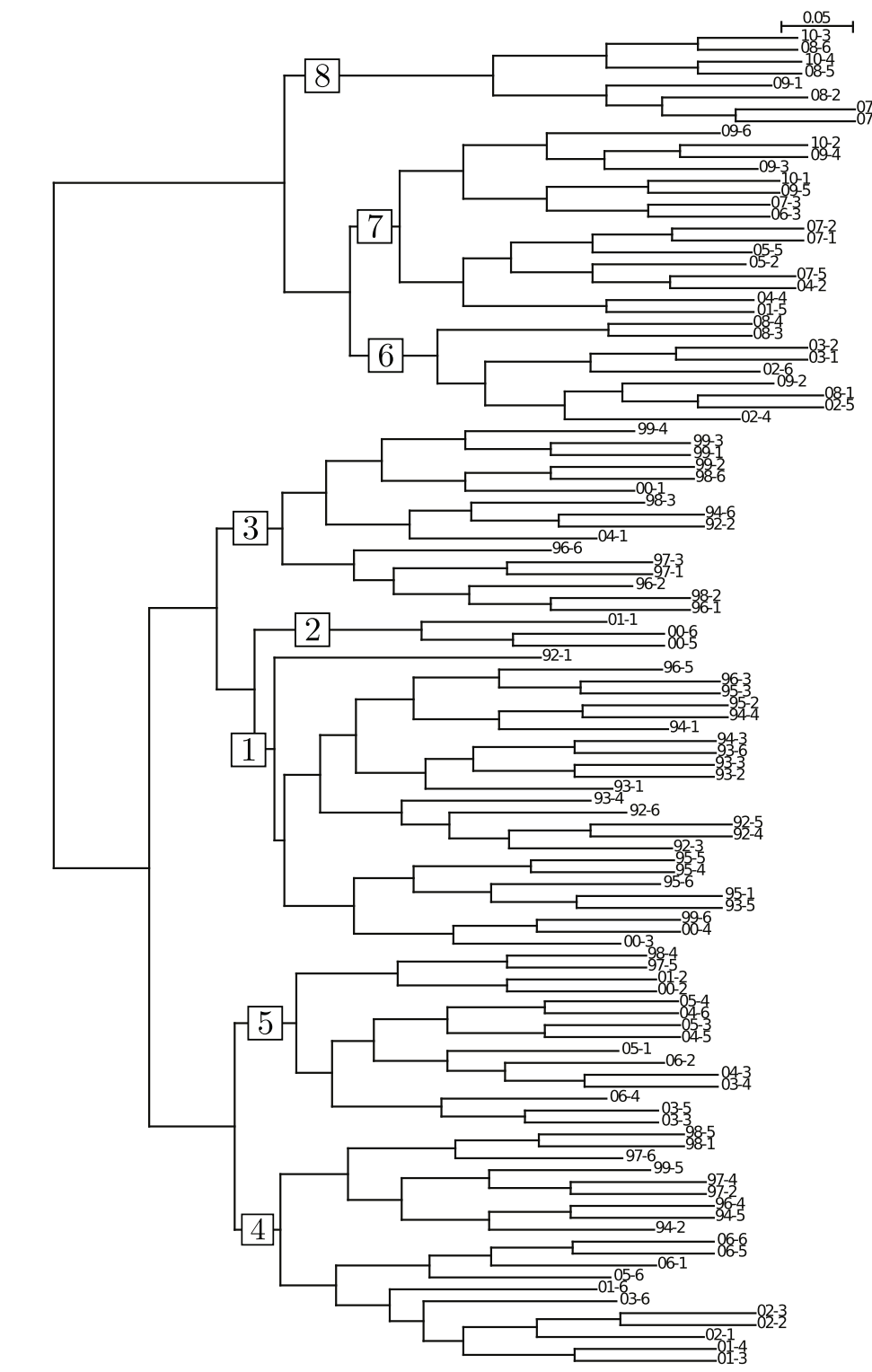
Münnix, Shimada, RS, Leyvraz, Seligman, Guhr and Stanley Scientific Reports 2 : 644 (2012)



Beyond trends and volatility:

Correlations!

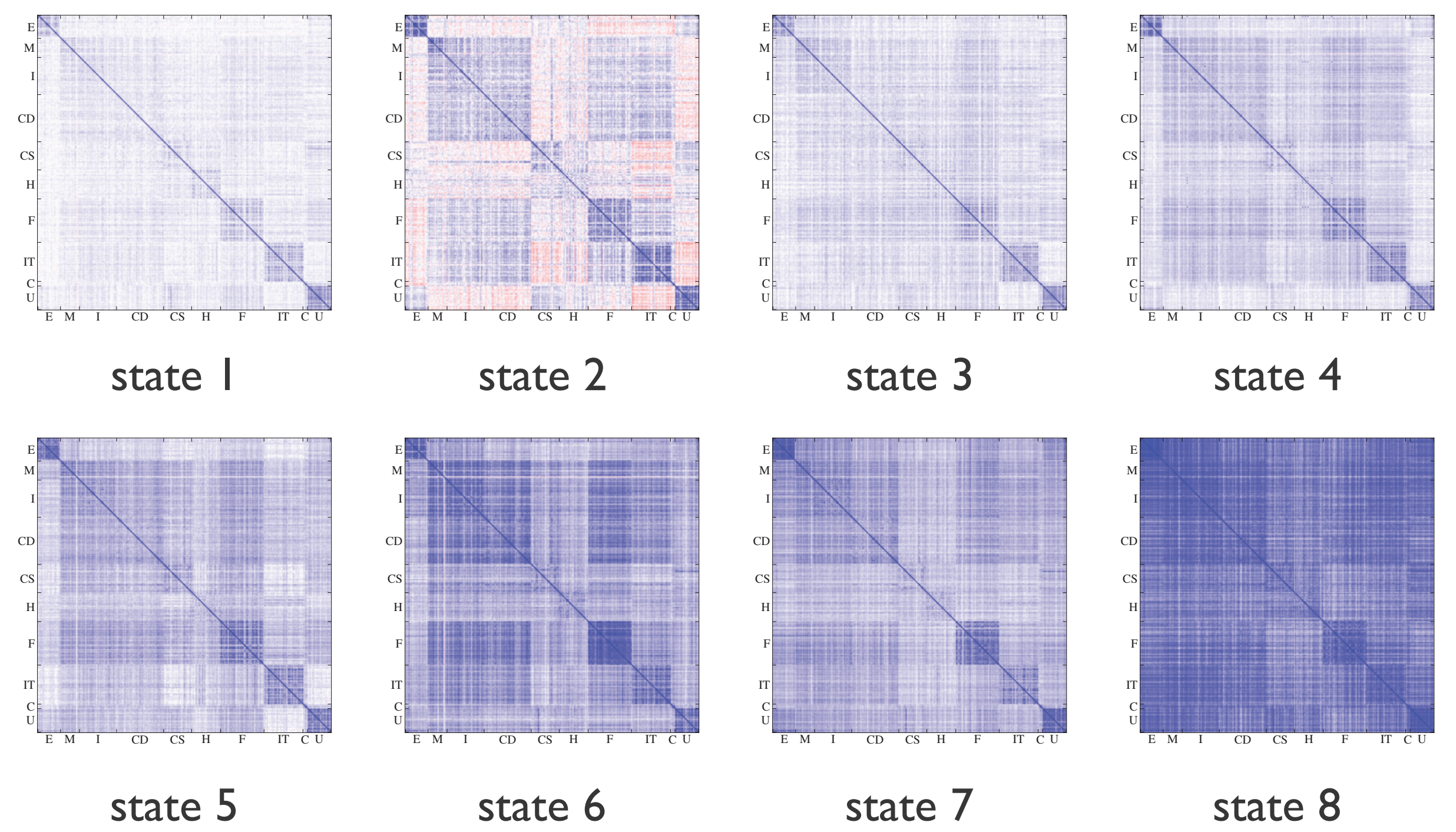
Clustering analysis



Identifying market states

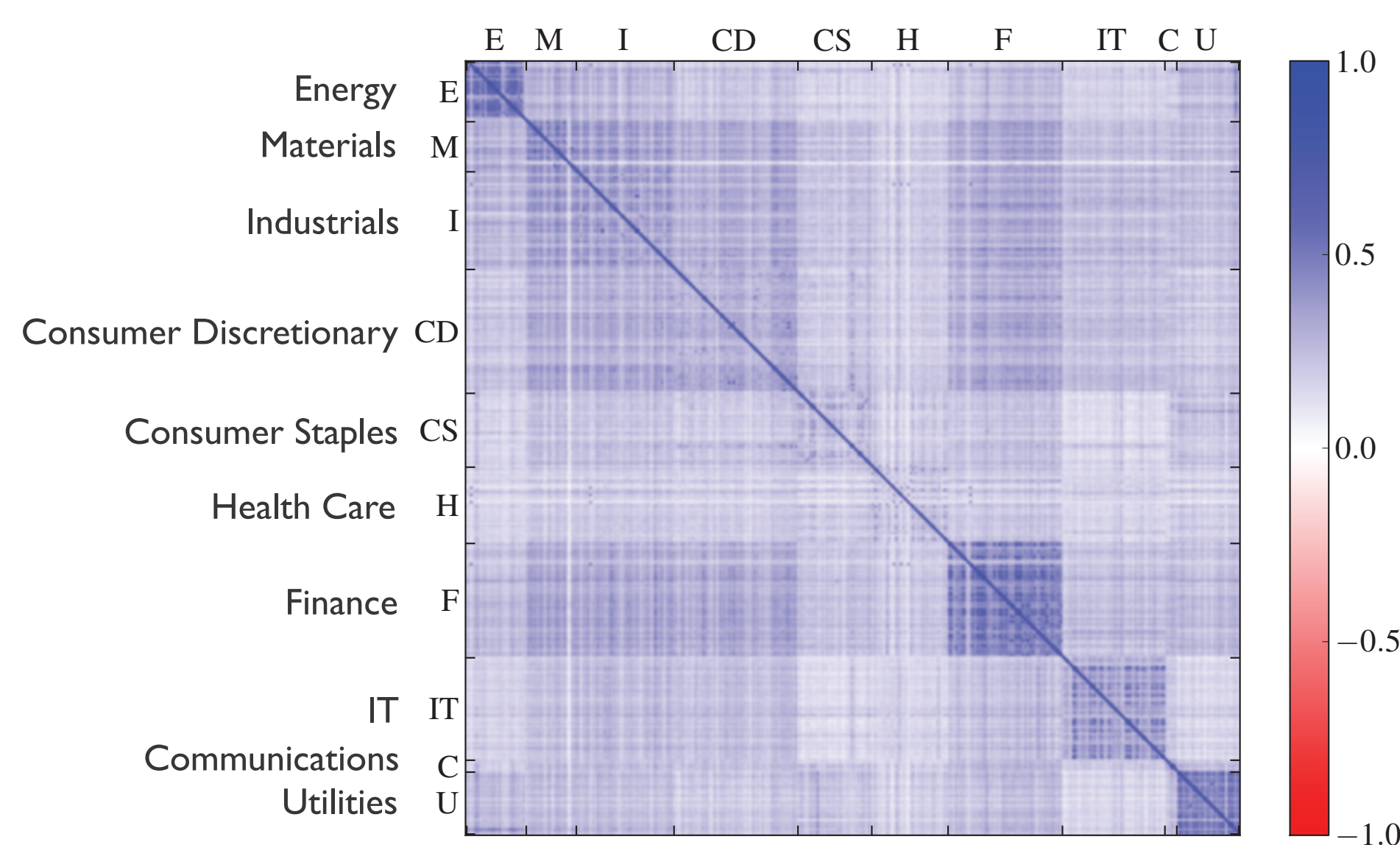
Market states

Correlation matrices of market states



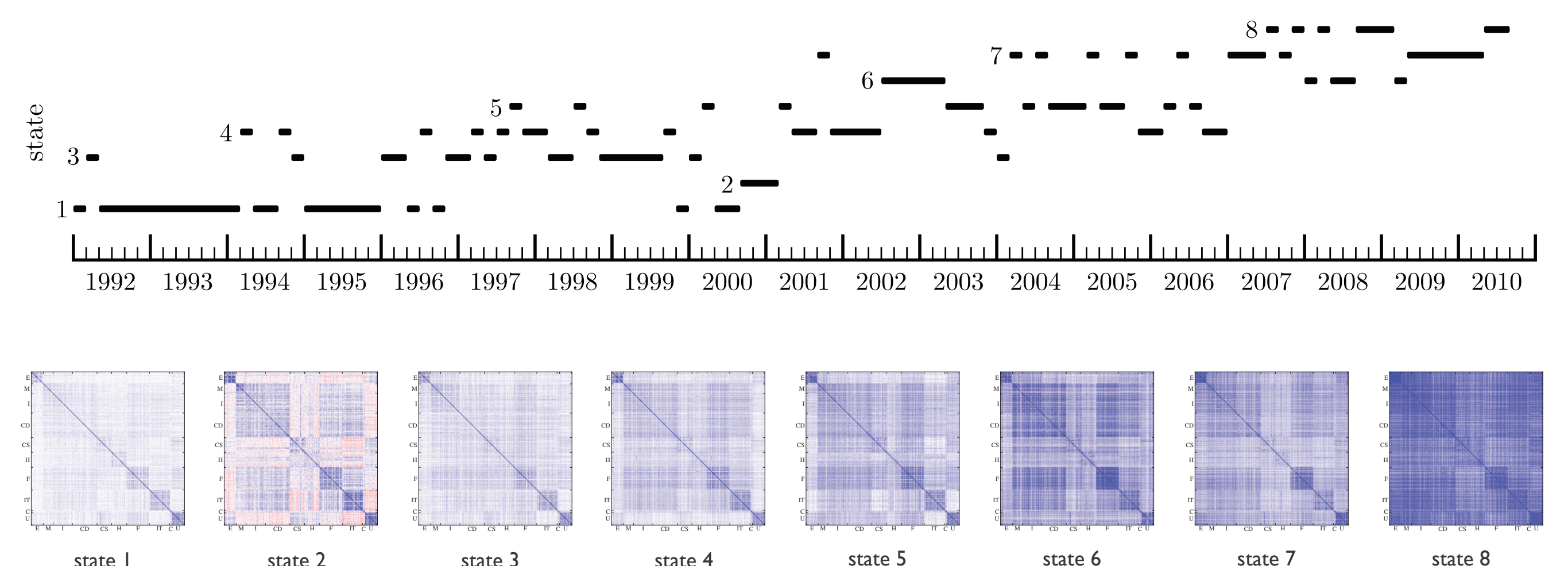
Correlation matrix

Daily returns of **S&P 500 stocks**, 1992 – 2010



structural information: relations between stocks, sectors
averaging quantity ~ macroscopic variable

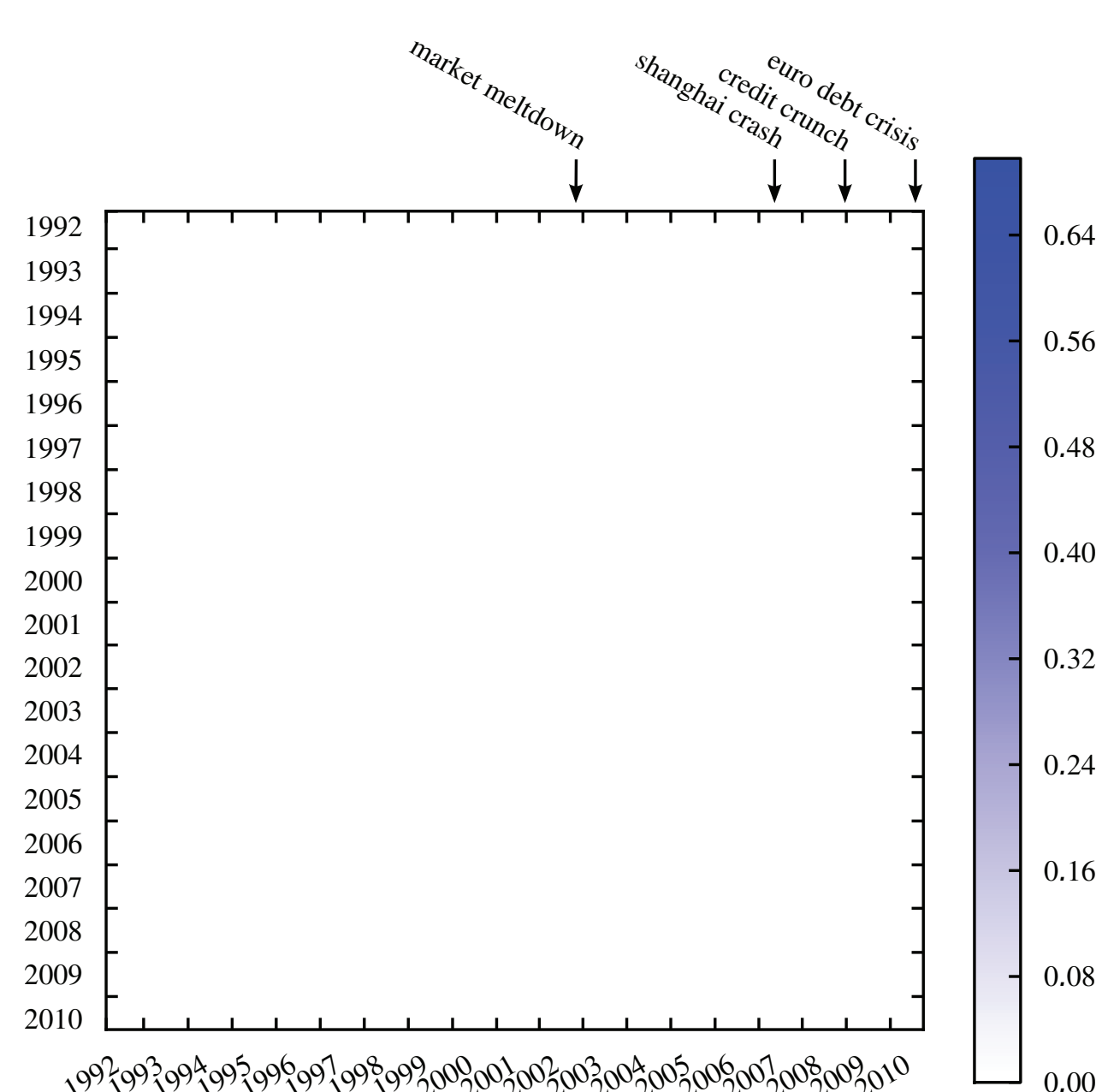
Evolution of market states



Distance measure

$$\zeta(t_1, t_2) \equiv \langle |C_{kl}(t_1) - C_{kl}(t_2)| \rangle_{kl}$$

Distance matrix (not correlation matrix)



Team & Collaborations



Michael Münnix



Thilo Schmitt

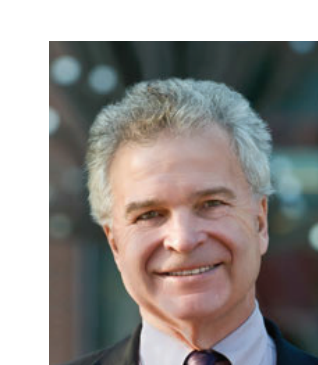


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