

Understanding the interaction between financial markets with ecological modelling techniques

J. A. Roberts, N. Kavallaris, and A. Rowntree

University of Chester
Mathematics
Thornton Science Park, Chester, England, CH2 4NU
`j.roberts@chester.ac.uk`

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A number of recent global and continent-wide events and decisions have brought financial markets and how they interact under scrutiny. We compare the historical indices of two such financial markets, which (on a global level) can be considered relatively close geographically and could be considered two of the major markets (if not the major markets) within Europe: The London FTSE100 and the Frankfurt DAX. The purpose of our comparison is to see if, by treating these markets as different species operating in the same ecosystem some insight can be gained by modelling the two markets with ecological models of interacting species. In particular, we are looking to ascertain if, historically, we can identify periods of time where the markets are exhibiting behaviour which may, in ecological terms be described as mutualistic, competitive or predation by one species on the other. Furthermore, we ask the question as to whether or not such information, when coupled with our knowledge of corresponding economic events at the time can provide some indication as to future market behaviour and the types of interactions to expect at key times between the two markets under consideration.

In order to seek answers to these questions we introduce delay and feedback into a number of ecological models and consider the dynamical behaviour of such models, before considering other aspects such as parameter estimation and the sensitivity of the system to changes in those parameters.