On lead-lag estimation

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Abstract

It is commonly acknowledged by financial practitioners that some assets are "leading" or "driving" others, in the sense that their behaviour at a given time has a major influence on the behaviour of the "followers" or "lager".

In this work, we propose a toy model for defining the notion of lead-lag between two assets X and Y, by introducing some time shift in the Brownian component of X that is common with Y when X and Y are marginally two continuous Brownian semimartingales, driven by two dependent Brownian motion. This time shift is defined as the lead-lag parameter.

We explore here the problem of estimating this parameter, when the two assets are observed at discrete times.