

**AN ANALYSIS OF U.S. STOCK PRICE  
BEHAVIOR USING WAVELETS**

**ABSTRACT**

Using wavelets we re-examine the U.S. stock market price index for any evidence of self-similarity or order that might be revealed at different scales. The wavelet transform localized in time can be used to indicate how the power of the projection of the signal onto the kernel varies with the scale of observation. By comparing how the local power scales vary over time much information about the structure of the data can be obtained. Such evidence is not at all evident from standard analyses of untransformed data, including projections onto a Fourier basis. Wavelets can detect structures in data that are highly localized in time and therefore non-detectable by Fourier transforms.

The main conclusion is that while the data are clearly complex, there seems to be some evidence of non-randomness in the data. There is also some limited evidence of quasi-periodicity in the occurrence of large amplitude shocks to the system.