

**TEMPORAL IRREVERSIBILITY OF TIME SERIES:
CIRCULATION AND ITS ECONOMIC APPLICATIONS
(RÉSUMÉ)**

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When modeling with time series, we often observe that the data being modeled is nonlinear. A common type of nonlinearity is when a series behaves asymmetrically in one way or another. Temporal irreversibility is one such type of asymmetry, when the process has different properties whether taken forward or backward in time.

Many economic studies find evidence of temporal asymmetry. For example, there is ample evidence, that the fuel price mark-up has the tendency to grow fast and diminish slowly. Another example is the ‘steepness effect’ (e.g. in real business cycles), whereby decreases in various measures of economic activity are faster than increases.

We propose a measure of circulation that measures the tendency of a process to feature ‘fast up, slow down’ or ‘slow up, fast down’ behavior. We discuss sample measures of circulation, and their convergence to the corresponding population measures. We study both the discrete and the continuous state space cases.

We present several case studies that provide possible areas of application of this index in economics, notably the study of fuel price mark-ups and U.S. employment rates, both exhibiting significant nonzero circulation. Further research directions are proposed.