

Clustering to Identify States for Hidden Markov Models: Applications for Macroeconomic Time Series

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Abstract

Regime switching is a common modelling tool in macroeconomics used in an attempt to explicitly model structural shifts observed in the data. However, these structural shifts are usually unable to be identified. Researchers usually assume the number of states and what parameters govern the dynamics related to these states. I present a data-driven method to identify states using clustering algorithms from the machine learning literature, which are then used to initialize a Hidden Markov Model (HMM) to estimate state dynamics. This approach is useful for estimating state dynamics when states are unknown. We find that this can be useful for modelling macroeconomic and financial time series data.

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