**Methodology**

Estimate a Spatial-Temporal Durbin model (LeSage and Pace, 2009) of the form:

or, more generally, from Pace, et. al. (1998)

Rather than allowing the weight matrix to be the standard spatial weight matrix, we decompose the term into a spatial and temporal component such that , where measure the autoregressive impacts from space and time. As shown in Pace, et. al. (1998), this assumes there is no interaction of time and space and if that is not assumed true, then W needs to be decomposed further yielding parameters measure the impact of the space-time interactions (). The most general model that can then be estimated is shown as equation (4) in Pace, et. al. (1998):

In this specification we have Z as an by matrix of independent variables that are unlagged while X is an by matrix of independent variables that are lagged. The parameter estimates of and represent the impact from independent and dependent variables located within some spatial proximity to the observation while and represent the impact from the same variables transacted within a specific timeframe from the current observation.