Peer effects and interorganizational performance similarity: A longitudinal study

I used a dyadic panel model. The dataset is dyadic because each observation refers to one of the possible pairs of hospitals in the sample, e.g. RI Nij. The dependent variable is also dyadic, measuring similarity in performance. This dataset is panel because the dyads are repeatedly observed over time. The first lag of the dependent variable makes the model dynamic. Because the outcome is continuous and the key independent variables are at network level, we use a multilevel regression estimated by the Generalized Methods of Moments (GMM) (Arellano and Bond 1991) and Blundell and Bond (1998) and clustered the standard errors at sender and receiver levels. The empirical model adopted in this study takes the following form:

\[ E(y_{ij,t}) = \alpha_0 c_{ij,t} + \beta_1 G_{ij,t} + \beta_2 c_{ij,t} + \beta_3 G_{ij,t} + \beta_4 P_{ij,t} + \beta_5 P_{ij,t} + \beta_6 P_{ij,t} + \beta_7 P_{ij,t} + \delta X_{ij,t} \]

where \( y_{ij,t} \) is the difference in performance between hospital \( i \) and hospital \( j \) at time \( t \); \( \alpha_0 \) is the one period lagged dependent variable; \( c_{ij,t} \) is the strength of ties; \( G_{ij,t} \) is the strength of ties raised to the power of 2; \( P_{ij,t} \) indicates the direct connect between hospital \( i \) and hospital \( j \); \( c_{ij,t} \) is clique co-membership; \( G_{ij,t} \) is the clique co-membership raised to the power of 2; \( P_{ij,t} \) indicates the degree of positional similarity; \( G_{ij,t} \) is the positional similarity raised to the power of 2; \( P_{ij,t} \) is the interaction effects for connection and structural equivalence; \( X_{ij,t} \) summarizes the effects of covariates in the model, which may refer to \( i \) or \( j \) or both. Regarding parameters: \( \alpha \) is the effect of the lagged dependent variable, capturing persistence in performance similarity; \( \delta \) measure the strength of the variables of theoretical interest; and \( \delta \) measures the effects of control variables. Because the data are dyadic, continuous organizational covariates, i.e. number of staff, bed size enter into the model as absolute differences between the pair of hospitals. The smaller the difference is, the more similar the hospitals are with respect to the considered variable. For covariates taking categorical (LHU membership) and binary values, an exact match is used to identify hospitals in the same category.