

Abstract: Spatial multivariate econometric models are typically used to model dependences between locations, often by adapting univariate models such as SEM or SLM models. However, such approaches do not allow for intra-location dependencies to be accounted for. Our new multivariate spatial econometric model can account for feedback effects between different variables within the same location. These effects, which are termed the termed intra-location feedback, have not been considered before. We discussed model identification of both the previously used multivariate model and our extended version. Other fundamental properties of the new model are established. We present statistical inferences using an analytical method based on empirical precision matrix as well as the maximum likelihood method. Model validation for a data set is also discussed.