Title: Sparse Spatial Autoregressive modeling of Poverty in the Philippines

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Abstract:

Phenomena and systems interact with one another across space and time. Poverty, just like other socio-economic and environmental systems, is then analyzed and defined in relation to its location in a space-time continuum. The sociological perspective is aptly tallied in the spatial dimension, while the economic perspective is addressed in the temporal dimension. This paper aims to postulate a spatio-temporal model that reflects the geographic structure of poverty in the Philippines from 1985 to 2000. The study postulated a spatiotemporal model for selected poverty indicators and compared the SAR (Spatial Autoregression), OLS (Ordinary Least Squares), and Mixed models. The household level information in FIES data for six time points (1985, 1988, 1991, 1994, 1997, 2000) were aggregated at the provincial level.

The improvement in predictive capability and dimension reduction relative to other modeling techniques should earn Sparse Spatial Autoregression a recommendation in the field of spatio-temporal medeling. Spatio-temporal predictions are more pronounced using this method, despite its computational complexity. The results of the out-of-sample prediction through simple cross-validation further prove that SAR is far better than OLS in terms of predictive capability.

There is indeed spatio-temporal clustering among provinces in the Philippines in terms of poverty distribution. The temporal autocorrelation also suggests that poverty remains a stark reality in the Philippines.

Keywords: Spatio-temporal modeling, Sparse Spatial Autoregression, OLS, mixed model, Poverty