

An Evaluation of the Accuracy of Regional Population Projections: Investigation on the Spatial Characteristics in the Projection Error Rates using Regression Models

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In this paper, we evaluate the accuracy of "The Regional Population Projections" conducted by the National Institute of Population and Social Security Research. The projections include two types of error rates (APE, ALPE) that are used to analyze spatial and time series characteristics of error rates using a regression method. In this paper, we analyze the projections conducted on base-populations from 1985 to 2010 for prefectures, and from 2000 to 2010 for municipalities.

We found that error rates have had the tendency to decrease in recent projections, due to declining birthrates and population aging, and that the error rates tend to increase for smaller base-populations. In metropolitan areas, the error rates tend to be under-projected, whereas they become over projected for small local governments in non-metropolitan prefectures such as the Nara Prefecture.

We found salient features in spatial characteristics of error rates in two aspects: (1) spatial autocorrelation of the error rates were detected in prefectural models when the projected period was short, which they were for municipal models in general. Therefore, it is necessary to use spatial econometric models, such as the spatial error component model, when evaluating the error rates at municipal levels in regression based evaluations. (2) We did not detect spatial heterogeneity in the regression coefficients. On account of this, there was no need to employ local estimation techniques in the evaluation of population projection errors for Japanese prefectures and municipalities.

【Key Words】 Regional Population Projections, Projection errors, Spatial Autocorrelation, Spatial Heterogeneity