



Small area models for Brazilian business survey skewed data

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Abstract

The Brazilian Institute of Geography and Statistics (IBGE) carries out a Service Sector Annual Survey that focuses on segments of the tertiary sector. Sample estimates for some economic activities in the North, Northeast and Midwest regions of Brazil have low precision due to the sample design. Furthermore, one of the main variables of interest is considerably skewed with potential outliers. To overcome this problem, skew models are proposed to produce model based estimates. The small domain estimation models relate operating variables with auxiliary variables (employed persons and wages) obtained from a Business Register. The proposed models have been compared with the usual Fay-Herriot model under the assumption of unknown sampling variances. The evaluation studies with real business survey data show that the proposed models seem to be more efficient for small area predictions under skewed data than is the customarily employed normal area model.

Keywords: hierarchical model; Bayesian Inference; MCMC; skew models.