Prediction of Quarterly Urban Unemployment Rate in India by combining PLFS estimates and Grey Model

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Quarterly urban Unemployment Rate (UR) is a crucial indicator representing the livelihood of people in the urban areas of India. Accurate forecasting of the UR is essential for early identification of the socio-economic problems so that timely and targeted intervention, and proper policy planning can be done to reduce the same. In India, Periodic Labour Force Survey (PLFS) conducted by Ministry of Statistics and Programme Implementation, Government of India provides estimates of quarterly urban UR at the state and national level since April-June, 2018. However, these estimates are limited in number for time series forecasting which typically require large datasets and thus, may not yield reliable forecasts due to the violations of data requirement assumptions. Therefore, the present study aims to predict quarterly urban UR in India at the state and national level for different age groups and gender based on PLFS estimates from the quarter April-June, 2018 to July-September, 2024 using grey models. These models are particularly effective in situations characterized by chaotic, noisy, and insufficient data, as they incorporate recent updates to improve prediction accuracy. The results reveal that grey model shows good forecasting performance for most of the states as well as at the national level for all the age groups and gender with RMAPE values ranging from 5.64 to 36.48%.