

Decoding the Kerala Workforce Productivity Paradox: Human Capital, Gender Inclusion, Digital Infrastructure and Spatial Spillovers – A District-Level Panel Analysis

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Abstract

Kerala presents a compelling paradox in Indian development economics: high human development indicators coexist with persistently low workforce participation rates, stagnant total factor productivity in several districts, and acute spatial heterogeneity in labour market outcomes. This paper investigates the determinants of workforce productivity across Kerala's 14 districts using a spatial panel dataset spanning 2004–05 to 2021–22. Deploying the Spatial Durbin Model (SDM) – which accounts for both direct and indirect (spillover) effects of covariates – alongside conventional fixed-effects panel regressions as benchmarks, we identify human capital intensity, female worker participation, digital infrastructure penetration, and productive use of remittance income as key drivers of district-level labour productivity. Crucially, we detect significant positive spatial spillover effects: improvements in productivity in any single district propagate to contiguous districts, with a spatial lag coefficient of 0.362 ($p < 0.01$). Conversely, remittance income exhibits a modest but statistically significant productivity-dampening effect – consistent with the labour-supply withdrawal hypothesis – with a total spatial effect of -0.227 . A k-means clustering of the 14 districts yields four distinct productivity typologies, each requiring tailored policy responses. The paper contributes to the spatial labour economics literature by providing the first district-level SDM analysis of workforce productivity for a single high-HDI Indian state, with direct implications for Kerala's post-COVID-19 economic recovery strategy and India's broader Skill India Mission.

Index Terms

Workforce Productivity; Kerala Labour Market; Spatial Durbin Model; Human Capital; Female Worker Participation; Remittance; District-Level Panel Data; Total Factor Productivity; Digital Infrastructure; Spatial Spillovers. JEL Classification: J24, R12, O15, J16, F22, O33, C23