

# **An Economic Study of Performance of Secondary and Higher Secondary Education in India**

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## **Abstract**

The output oriented technical efficiency ( $TEF_{out}$ ) and input-oriented technical-efficiency ( $TEF_{inp}$ ) of Indian Secondary and Higher Secondary education is obtained using Data-Envelopment-Analysis with variable returns to scale, multiple output and input framework exploring (i) secondary data, with state as an unit of account and separating the units into general-category and special-category-states & union-territories(UT), as two groups are non-homogeneous in fiscal and economic conditions, for 2010-11 to 2015-16, taking Unified-District-Information-System for Education (UDISE) data and (ii) primary data with school as a unit of account, collecting the data through stratified-random-sampling of 25 government-aided & government schools in Kolkata in 2019-2020, and their determinants is found. The primary survey shows majority students take private tuition, that may affect technical-efficiency (TEF). The part of variation of  $TEF_{out}$  and  $TEF_{inp}$  not accounted by private tuition is found. Not all the states/UT and the sample schools are with full TEF for both  $TEF_{out}$  and  $TEF_{inp}$ . The possible reduction in inputs, to produce the same output bundle is obtained. The second stage panel regression using first stage estimated  $TEF_{out}$  and  $TEF_{inp}$  taking the effects of infrastructure, policy, macro and social indicators gives the determinants for state/UT. Individual effect of each variable is tested, instead of forming a composite index for wider category, as the individual effect of a variable matters for framing proper policies. The cross-section regression taking effects of role of headmaster (HM), characteristics of HM; teacher; students, school infrastructure & administration, school characteristics & student composition, policy variables, student's perception about school's quality gives the school-level determinants of  $TEF_{out}$  and  $TEF_{inp}$ . Results show case-specific relevance of included individual variables under broad categories. Policy suggestions are made for boosting TEF both for state/UT and schools.

**Keywords:** Secondary and Higher Secondary Education, Output and Input Oriented Technical Efficiency, Data Envelopment Analysis, Secondary Data, Panel Data, Government-aided and Government Schools, Cross-sectional Data, Primary Survey Data, Kolkata, India.