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Analyzing the Impact of Education Expenditure on Economic Growth in the United States

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Abstract

Education expenditure has been a pillar of U.S. economic policy, rooted in the belief that investments in human capital drive innovation, productivity, and long-term growth. Becker (1964) theorized that education enhances individual productivity, translating to macroeconomic gains. However, Hanushek and Woessmann (2007) caution that spending alone is insufficient without quality reforms, a critique echoed in cross-country growth models (Barro, 1991). Similarly, Romer (1990) emphasizes innovation as a complementary lever, where R&D investments amplify education's impact. Over the past two decades, federal and state governments have significantly increased per-student spending, from 7,394 in 2000 to 15,770 in 2023. Despite this near doubling of investment, the tangible impact of education spending on economic performance remains contested, particularly amid macroeconomic volatility such as the Great Recession, post-pandemic recovery, and inflationary surges peaking at 8% in 2022. This paper investigates the relationship between education expenditure and GDP per capita growth in the United States, hypothesizing that while such spending stimulates economic growth, its returns diminish at higher funding levels and are mediated by factors like inflation, labor force participation, and research and development (R&D) investment.

The analysis employs a fixed-effects panel regression model to isolate state-level heterogeneity and quantify the role of education spending against broader macroeconomic trends. Key variables include annual GDP per capita growth, per-student education expenditure, inflation rates, labor force participation, and R&D investment. Preliminary findings reveal a positive correlation between education spending and growth, yet diminishing returns in high-spending states like New York suggest inefficiencies in resource allocation. Additionally, R&D investment, which reached 3.43% of GDP in 2022, amplifies education's growth impact, highlighting synergies between education and innovation.

This study addresses critical policy questions: How can education budgets be optimized to maximize growth? What role do federal initiatives like the CHIPS Act play in enhancing returns on education



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investment? By integrating granular expenditure data with macroeconomic indicators, the research provides actionable insights for equitable funding, workforce alignment, and sustainable development.

Keywords: Education Expenditure, Economic Growth, Linear Model, Quadratic Model