

# Free College and Economic Growth: A Paradox of Innovation Productivity

Akiomi Kitagawa\*

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## Abstract

This paper investigates the macroeconomic effects of tuition subsidies in an overlapping-generations model with endogenous growth and innovation. Calibrated to the Japanese economy, the model explores the “growth puzzle” where expanded educational attainment often yields modest aggregate productivity gains. We identify a “paradox of innovation productivity”: while subsidies can achieve a Pareto improvement in low-innovation environments, highly productive innovation may cause technological progress to outpace capital accumulation. This dynamic destabilizes the tax base by eroding the capital-effective labor ratio, rendering aggressive subsidies fiscally infeasible in equilibrium. Our findings suggest that the feasibility of free college policies depends critically on the economy’s innovation productivity and its resulting impact on the dynamic interaction between technological progress and the fiscal foundation.

**JEL classification:** E13, O41, I22, H52

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\*Graduate School of Economics and Management, Tohoku University, 27-1, Kawauchi, Aoba-ku, Sendai, 980-8576, JAPAN; E-mail: akiomi.kitagawa.a4@tohoku.ac.jp