

# Knowledge Capital and Its Impact on U.S. State-level Labor Productivity Growth, 2007-2016

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In this paper, we examine the role of educational skill-building in the process of economic growth by examining the effects of the educational composition and cognitive skills of the workforce on labor productivity growth across states over the most recent business cycle, 2007-2016, for both the private nonfarm sector and for major industry groups. We do so using a new state-level labor productivity dataset. Whereas most of the prior research on state-level productivity growth uses employment as the labor input, we use an hours-worked measure. Our hours measure is created using a relatively new average weekly hours data series for private nonfarm wage and salary workers from the U.S. Bureau of Labor Statistics (BLS) establishment survey – the Current Employment Statistics (CES) survey. We adjust this data series from an hours-paid basis to an hours-worked basis using information on paid vacation and sick leave from the BLS National Compensation Survey. We also include hours for proprietors by combining state proprietor employment data from the U.S. Bureau of Economic Analysis (BEA) with Current Population Survey (CPS) measures of average weekly hours worked by proprietors. Our measure of state output is real GDP by state from BEA.

For this relatively short time period, the convergence predicted by Barro and Sala-i-Martin (1992) does not have strong predictive power for the private nonfarm sector, whether or not we use output per employee or the more accurate measure of output per hour worked. However, when the share of college graduates for persons aged 20-65 who are not working in each state is included as an initial condition, the predictive power of the simple convergence model increases and the share of college graduates has a positive and significant effect on productivity growth. We also intend to examine the effects of other state measures of human capital or knowledge capital, such as years of schooling, math achievement test scores from the National Assessment of Educational Progress adjusted for migration following methodology by Hanushek, Ruhose, and Woessmann (2017), and school spending, on state level productivity growth, both for the private nonfarm sector and for major industry groups.

Hanushek, Eric A., Jens Ruhose, and Ludger Woessman. “Knowledge Capital and Aggregate Income Differences: Development Accounting for US States.” *American Economic Journal: Macroeconomics*, 2017, 9(4): 184–224, <https://doi.org/10.1257/mac.20160255>

Barro, Robert and Xavier Sala-i-Martin. 1992. "Convergence." *Journal of Political Economy*, 1992, 100(2): 223-251.