# Innovation Nation: The Impact of Broadening Access to Doctoral Education on Ph.D. and Patenting Outcomes*

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**Abstract**

This paper explores how broadening access to doctoral education impacts Ph.D. and patenting outcomes. Matching the universe of Ph.D. recipients to the full count U.S. Censuses (1850-1940), an event study research design shows that the expansion in Ph.D. programs in the early 20th century increased doctorates and patentors. The expansion increased Ph.D. access for underrepresented groups, including minorities, children of immigrants, rural households, and lower socioeconomic status families; however, men gained more relative to women. Additional evidence suggests spillovers that improve patent quality and promote more inventors, including among non-doctorates.

**Keywords:** Ph.D. education expansion, Diversity, Patenting, Innovation
**JEL Codes:** I23, I24, O31

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