The Learning Curve and Optimal Production Under Uncertainty

Saman Majd & Robert S. Pindyck

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This paper examines the implications of the learning curve in a world of uncertainty. We consider a competitive firm whose costs decline with cumulative output. Because the price of the firm's output evolves stochastically, future production and cumulative output are unknown, and are contingent on future prices and costs. We derive an optimal decision rule that maximizes the firm's market value: produce when price exceeds a critical level, which is a declining function of cumulative output. We show how the shadow value of cumulative production, as well as the total value of the firm, depend on the volatility of price and other parameters. Over the relevant range of prices, uncertainty reduces the shadow value of cumulative production, and therefore increases the critical price required for the firm to begin producing.

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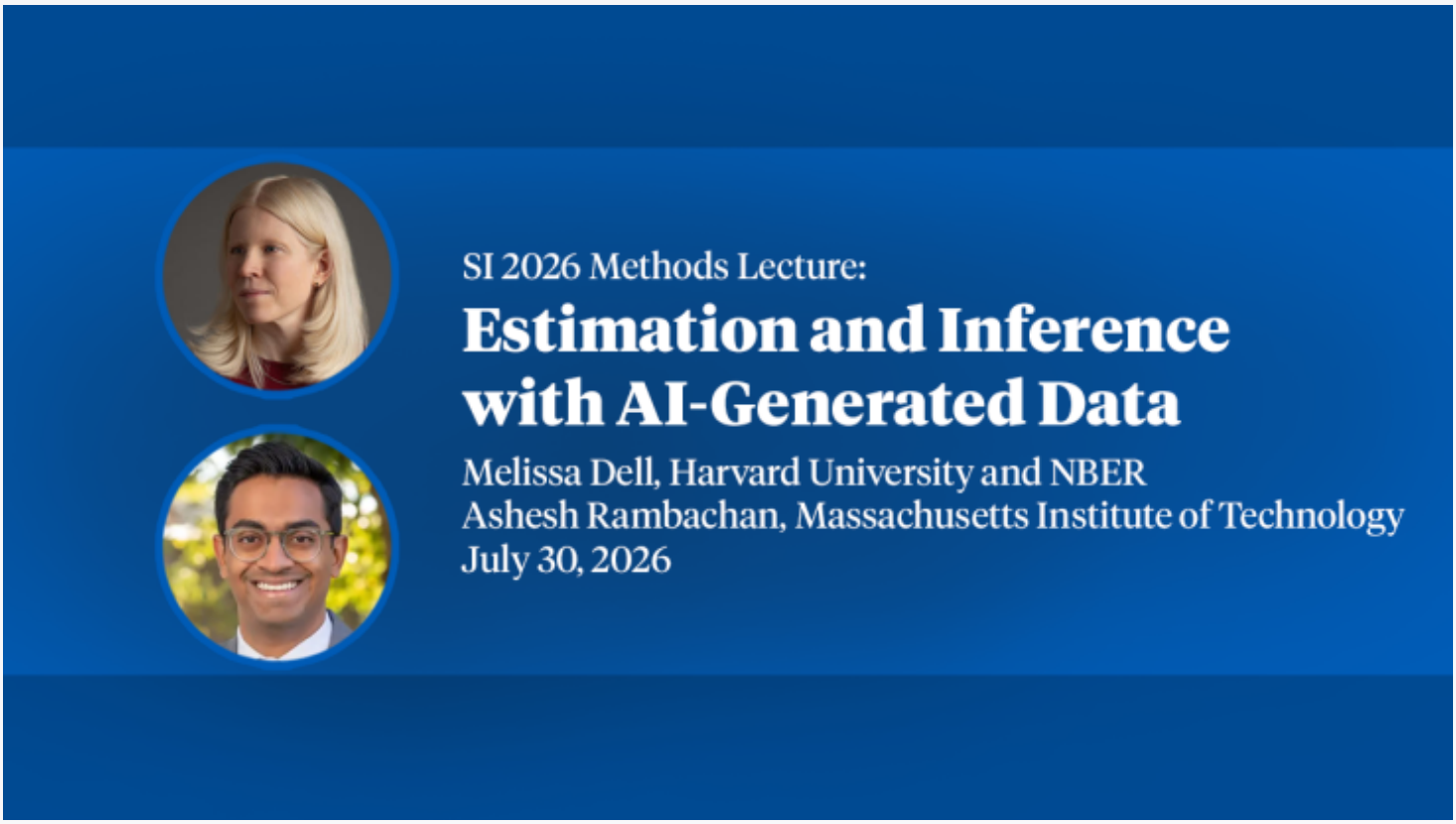


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Contact Us
1050 Massachusetts Avenue
Cambridge, MA 02138

617-868-3900
info@nber.org
webaccessibility@nber.org

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