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Investment Demand When Economic Depreciation is Stochastic

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Panos Fousekis , James S. Shortle

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Abstract

The neoclassical model of investment by a risk-neutral firm is generalized to include uncertainty about the rate of depreciation by replacing the deterministic capital accumulation identity with a stochastic variant. Ito's stochastic dynamic optimization is used to derive conditions for optimal investment. A nondegenerate steady-state distribution of the capital stock is shown to exist and is derived for the empirically important case of a normalized quadratic profit function and static price expectations. It is demonstrated for this case that uncertainty about the rate of depreciation decreases the expected steady-state capital stock and investment.

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