

# A Stochastic Equilibrium Economy with Optimal Capacity Expansion

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We consider a stochastic continuous time economy on a finite time interval, with a representative agent and a single firm producing the consumption good. The agent consumes the commodity, uses leisure, and holds money for the purpose of transaction services. The agent maximizes her expected total utility of consumption, leisure, and money. On the other hand, the firm chooses the employment rate, holds money, and aims to solve the stochastic control problem of optimally expanding the production capacity in order to maximize its expected total profits. The firm's capacity is modeled as a controlled Ito process in which the control is the real investment rate.

We show how to construct an equilibrium where prices (and other parameters) are set so that both the agent and the firm can achieve their optimal choices.