Irreversible Investment under Volatility Ambiguity

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Abstract

This paper studies the investment timing problem of a firm possessing an irreversible investment option and perceives ambiguity about the volatility of the process driving her payoff. Ambiguous volatility is modeled by a set of probability measures which are non-equivalent, which requires significant departure from the standard theory. We exploit recent advances in non-linear expectation theory and a new theory of stochastic calculus to characterize the optimal investment strategy of the firm. Paralleling the standard theory, we show that the problem of the firm can be charachterized as the solution of a free boundary problem. We show that contrary to risk, ambiguity decreases the value of investment an accelerates investment. This result is also in contrast with previous work focusing on *drift* ambiguity. Extending the model to the case of a competitive equilibrium, we show that the optimality of myopic behavior, which holds in the standard framework, fails under ambiguity.

Keywords: Optimal Stopping;Ambiguity;Real-Options;Continuous-time

JEL Codes: C61, D81, G31

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