

THE EFFECTS OF JUMPS AND REGIME SWITCHES ON THE VALUE OF WAITING TO INVEST

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1. INTRODUCTION

Given an opportunity to incur a sunk cost for investment, I , in order to install capacity and realize an investment value of V , what is the value of such an investment project and what is the optimal time to realize this option? The literature on investment under uncertainty, notably McDonnald and Siegel (1986), Pindyck (1991), and Dixit (1992), suggests that the investment value depends on the convenient yield as well as volatility of the investment-value process, while the optimal time for a firm to invest is to wait until the value of the investment project, V , rises to its threshold level, V^* . However, these results are based on a given investment-value diffusion process which is purely mean-reverting.

A natural question arises as to whether and how these results need to be modified if the investment value, V_t , actually evolves according to a diffusion process with random upward and downward jumps, or a diffusion process which switches between high and low regimes (or states) through jumps of a random size. To discuss this, let $\ln V_t = X_t$, where X_t is the investment value.