ABSTRACT

In this thesis, we study three real option problems for firm's investment strategies under asymmetric information. We consider that when firm owner (principal) delegates investment decision to manager (agent), manager has private information that owner cannot observe. Importantly, we examine not only investment timing, but also investment quantity under the asymmetric information situation.

We begin by examining optimal strategies for an irreversible investment. We show that investment timing is more delayed under asymmetric information than under full information, implying a decrease in equity value. However, in order to minimize this inefficiency, investment quantity is more increased under asymmetric information than under full information. Thus, there are trade-offs between efficiencies of investment timing and investment quantity under asymmetric information.

We then incorporate the reversibility of investment and investigate that how changes in the degree of reversibility affect investment strategies. We obtain that under asymmetric information, higher degree of reversibility accelerates investment timing and increases investment quantity, implying an increase in equity value. More interestingly, with a higher degree of reversibility, the distortion of asymmetric information on investment strategies are increased, and then the loss that arises from information asymmetry is increased.

As a further extension, we incorporate the possibility of technology improvement. We consider that after investment, there is a potential technology improvement which could help firm to save some operational expenditure. We examine the interactive effects between reversibility and technology improvement under asymmetric information. We find that with the possibility of technology improvement, higher degree of reversibility accelerates investment timing, but not necessarily increases investment quantity. Additionally, higher arrival probability of technology improvement accelerates investment timing, but decreases investment quantity. Finally, we find that the loss that results from information asymmetry is increasing with the arrival probability of technology improvement.