

2005:7  
Självständigt arbete i matematik  
Matematiska institutionen  
Stockholms universitet

## **Elin Oxenhielm: Optimal Cash Management**

### **Sammanfattning**

We study the problem of optimising the flow of cash in a large company when the cash reserve is assumed to follow a jump-diffusion process. This means that we have a Brownian motion to model ordinary fluctuations and a Poisson process to model large fluctuations, jumps, that occur due to rare unpredictable events such as wars or natural disasters. We derive the solution to this stochastic optimal control problem for both a pure diffusion model and a jump-diffusion model. The solution will be of "bang-bang" type, i.e. there exists a "switch point" at which it is optimal to change strategy. By numerical studies we analyse the switch point's qualitative properties, as well as the value of all cash that we take out over time as a function of the initial cash level. We also interpret this problem as the problem of deciding how much to supply of a specific commodity (we study the U.S. crude oil price in detail) based on an observed price, maximising the total supplied amount over time constraint to a maximum production capacity.