國立中山大學應用數學系
學術演講

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講　題：On the Mathematics of Optimal Investment
時　間：2019/05/17（Friday）14:10 ~ 15:00 pm
地　點：理學院四樓理 SC 4009-1 室
茶　會：15:00 於理 SC 4010 室 (系辦公室)

Abstract

The discussion is based on my personal research experience of some topics in the optimal investment from mathematical finance. Modern study of mathematical finance is a broad research area. There are many interesting and challenge mathematical problems from the study of finance and insurance. Investment problem is one of major topic.　I will discuss investment problem by introducing some model problems and their mathematical results. The goal of investment problem is to choose a portfolio to optimize a certain criterion. I will focus on the study of Merton portfolio optimization problem which I have experience. Merton-type portfolio optimization problems are classical problems. We can view the problem as a stochastic control problem. A classical approach is to apply the dynamic programming to derive the Hamilton- Jacobi-Bellman equation (HJB). The HJB equations are nonlinear partial differential equations.

When the HJB equation can be solved, a candidate of (feedback form) optimal policy can be derived. This approach suggests that an optimal portfolio problem can be solved through the study of a nonlinear partial differential equation (elliptic type or parabolic equation), hence the need for a serious study of HJB equation. Merton studied a simple model in 1969. He was able to solve the HJB equation to find an optimal portfolio. He studied more general models in 1971 and derived HJB equation. The equation has very complicated nonlinearity. The solution was open for many years. However, it also stimulates many studies since then. One can read Roger book ** to get some idea about the development of the

topic. I have my first publication on this topic in 1999***. I will discuss some recent results, based on several joint works with H. Nagai, H. Hata and Li-Hsien Sun.

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** L.C. G. Rogers (2013), Optimal Investment, Springer.

*** Find more at: shuenn-jyi sheu-Google Scholar Citations

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