ABSTRACT

Investment of pension assets are normally held in consideration of a financial market of different asset types such as stocks, bonds with different maturities or various financial derivatives.In recent years, two directions for funded pension systems have been taken. The first entails abolishment of the collective arrangement, and a direct move into individual pension schemes, where funding responsibility is shifted completely from sponsors to individuals. Various individual defined-contribution (DC) accounts are typical examples here. However, the DC schemes not only concentrate the risks on each individual, but also confront individuals with complex investment decisions. The second direction involves keeping the collective nature of the DB schemes, but spreading out the funding responsibility to all stakeholders (retirees, employees and sponsors). Various hybrid collective schemes are typical examples of such practices. It puts forward the question as to how risks should be allocated among stakeholders. Is one direction better than the other, or should both directions be improved? The answer to this lies in the development of a relevant contingent claim.The objective of this study is to construct a contingent claim that guarantees a specific investment return on a Defined Contribution fund assets held.. This thesis develops a general stochastic model in a frictionless market with assumed continuous trading. Within the framework of this model we discuss the modern theory of contingent claim valuation including the known option pricing formula of Black and Scholes. We then apply the Faynman-Kac representation theorem to generate the contingent claim process that allows for guaranteed investment income by solving the generated boundary value problem.This has been generalised to incorporate a further consideration of the market price of risk in a normalized gain process.A guaranteed investment income gives a member of a scheme an assured additional income generated from investments.