

# Utility maximisation over variable time horizons

Martin Schweizer

(ETH Zürich)

We consider the standard problem of maximising expected utility from terminal wealth over self-financing strategies, with a utility function which is also allowed to depend on time and  $\omega$ . For each fixed time  $T$ , denote by  $X_T$  the optimal terminal wealth for the problem with time horizon  $T$ ; so each  $X_T$  is a stochastic integral of the underlying price process  $S$ , but of course the integrand depends on the chosen time horizon  $T$ . Now consider the collection  $X_T$  (for  $T > 0$ ) of these random variables as a stochastic process. What kind of process is this, and what is its structure? Understanding this question is crucial for understanding how optimal portfolio choice depends on the time horizon. Answering this question also brings up other challenging mathematical problems in a natural way. The results given in this talk are joint work with Tahir Choulli (University of Alberta, Edmonton, Canada).