

On optimal strategies with financial and insurance risks

Pierpaolo Montana

Dipartimento di Matematica per le Applicazioni Economiche e Finanziarie
Università di Roma I "La Sapienza"
via del Castro Laurenziano, 9 - I-00161 Roma
and
CERMSEM - University of Paris I "Panthéon - Sorbonne"
Boulevard de l'Hopital 116-118 - F-75013 Paris

Extended abstract

In this paper we characterize the efficiency of contingent claims to future consumption in multi-period economy with uncertainty.

Efficiency is defined with respect to the class of Von Neumann - Morgenstern decision makers. We say that a contingent claim is efficient if it is an optimal choice for at least an agent with Von Neumann - Morgenstern preferences and a concave, strictly increasing utility functions.

We study a model where the agents are subject to two different kind of uncertainty, that we interpret as a financial one and an insurance one.

The financial uncertainty is represented by a standard tree model with a finite number of dates and a finite numbers of possible state of the world, with no information at all in the initial date and a complete disclosure at the terminal date.

The model is not supposed to be binomial, so for each node there is a finite number of possible subsequent nodes. The number of independent securities traded is supposed to be large enough to make complete the model.

At the terminal date there is a supplementary source of uncertainty described by a random variable defined on a different probability space, independent from the realization of the financial part of the model.

We interpret this source of randomness as a shock which can arrive to the agent at the end of his investment time period and can not be insured.

Economic interpretations of this model could be a financial plan of a worker with an uninsurable risk of being unemployed at the terminal date of his financial horizon. The question addressed in this paper is about the influence of this supplementary randomness on the investment decisions of the agent: we wanted to check if the independence of the sources of risk could be enough for obtaining the independence of the financial and insurance decision of a risk averse agent.

In general, it is well known that while in complete markets it is possible to separate in distinct phases the insurance decision and the investment decision, in incomplete

market this is not the case.

Our goal was to check if when specializing the structure of incompleteness would possible to recover the separation of investment and insurance decisions.

Our result shows that actually this is not the case: also with this very special kind of incompleteness the presence of an insurable risk has an influence on the investment decisions. On the positive side we give some results about a characterization of the efficient contingent claims in this context.

These results are preliminaries and further work is in progress currently.

This work owes much to the work of Jouini-Kallal "Efficient trading Strategies in the Presence of Market Frictions".