

PRICING WITH MULTIDIMENSIONAL COHERENT RISK MEASURES

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ABSTRACT

When we describe the portfolio consisting of some currencies it is more natural to use multidimensional approach given by Kabanov in [3]. The notion of multidimensional coherent risk measure was introduced in [2] by Jouini, Meddeb, Touzi. Their approach aims to take into account transactional costs while exchanging one currency to another. But in their model transactional costs are not random. So they do not take into account risk connected with changing of currency exchange rates that is one of the most important risks nowadays. In [4] we introduced the notion of multidimensional coherent risk measure which takes into account this type of risks and proved the representation theorem.

One of the most important problems of financial mathematics is pricing. The main result is the fundamental theorem of asset pricing (FTAP). There were various conditions in one-dimensional case to make the intervals of fair prices smaller. But these approaches are valid when we have basic asset or currency. However, it is not valid, for example, when we describe the portfolio consisting of some currencies.

The aim of this report is to give NGD condition for multidimensional random vectors. The technique given is analogical to one considered in [1], and the sets of fair prices are much smaller than with using NA pricing (See [3]). Here we give the notion and prove the theorems of No Good Deals (NGD) and define the set of fair prices using using this notion. Approach considered is analogical to [3], however the results obtained can be applied not only in discrete but also in continuous time. The sets of fair prices are smaller and we do not need to suppose the conditions like closeness of the set of strategies A . We give the notion of upper and lower prices and sub- and superhedging strategies along direction.

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