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ean-variance problems in mathematical finance

We give an overview of classical and new results on mean-variance hedging and mean-variance portfolio choice. The former is the problem of finding a best approximation (in the mean-square error sense) to a given financial payoff by means of a self-financing dynamic portfolio strategy. The later is the problem of finding via trading a financial position with minimal risk and maximal return. We give precise mathematical formulations (for all the terms used above) and present classical results as well as some recent developments. The overall goal is to reach a general mathematical audience rather than the specialists in the field. The talk is based on joint work with several collaborators.