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Asymptotics of the probability minimizing a "down-side" risk

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(Submitted on 13 Jan 2010)

We consider a long-term optimal investment problem where an investor tries to minimize the probability of falling below a target growth rate. From a mathematical viewpoint, this is a large deviation control problem. This problem will be shown to relate to a risk-sensitive stochastic control problem for a sufficiently large time horizon. Indeed, in our theorem we state a duality in the relation between the above two problems. Furthermore, under a multidimensional linear Gaussian model we obtain explicit solutions for the primal problem.

Comments: Published in at [this http URL](#) the Annals of Applied Probability ([this http URL](#)) by the Institute of Mathematical Statistics ([this http URL](#))

Subjects: **Probability (math.PR)**; Computational Finance (q-fin.CP); Portfolio Management (q-fin.PM); Risk Management (q-fin.RM)

MSC classes: 35J60, 49L20, 60F10, 91B28, 93E20 (Primary)

Journal reference: Annals of Applied Probability 2010, Vol. 20, No. 1, 52-89

DOI: [10.1214/09-AAP618](#)

Report number: IMS-AAP-AAP618

Cite as: [arXiv:1001.2131v1](#) [math.PR]

Submission history

From: Hiroaki Hata [[view email](#)]

[v1] Wed, 13 Jan 2010 11:43:17 GMT (135kb,S)

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