

Maximizing Growth Rate under Risk Constraints

Traian Pirvu
Department of Mathematical Sciences
Carnegie Mellon University
Pittsburgh, PA
tpirvu+@andrew.cmu.edu

January 5, 2005

Abstract

This work study the problem of optimal investment subject to risk constraints: *Value-at-Risk*, *Tail Value-at-Risk* and *Limited Expected Loss*. We get closed form solutions for this problem. In the more complicated situation of constrained sets depending on the current wealth level, we maximize the growth rate of portfolio subject to these risk constraints. We extend the analysis to a market with random coefficients, which is not necessarily complete. We also perform a robust control analysis. We find that a trader subject to Value-at-Risk and Tail Value-at-Risk is allowed to incur some risk. A trader faced with Limited Expected Loss constraint behaves more conservatively and does not exhibit the above behavior.