Title: Minimizing CVAR for a Portfolio of Financial Derivatives

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Value-at-risk (VaR) and Conditional-value-at-risk (CVaR) are the most frequently used risk measures in current risk management practice. As an alternative to VaR, CVaR is attractive since it is a coherent risk measure. We analyze the problem of computing the optimal VaR and CVaR portfolios. In particular, we illustrate that VaR and CVaR minimization problems for derivatives portfolios are typically ill-posed. For example, the VaR and CVaR minimizations based on delta-gamma approximations of the derivative values typically have an infinite number of solutions. In this paper, we focus on the portfolio selection problem which yields a portfolio of the minimum CVaR with a specified rate of return. We propose to include cost as an additional preference criterion for the CVaR optimization problem. We demonstrate that, with the addition of a proportional cost, it is possible to compute an optimal CVaR derivative investment portfolio with significantly fewer instruments and comparable CVaR and VaR. A computational method based on a smoothing technique is proposed to solve a simulation based CVaR optimization problem efficiently. Comparison is made with the linear programming approach for solving the simulation based CVaR optimization problem.