

VGSCO Colloquium: November 22, 2017

When: Wednesday, 11:30 - 12:30

Where: ISOR Meeting Room 6.511 (6th floor), Faculty of Business, Economics and Statistics

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Dynamic programming for multivariate problems involving risk measures

Multivariate risk measures appear naturally in markets with transaction costs or when measuring the systemic risk of a network of banks. Recent research suggests that time consistency of these multivariate risk measures can be interpreted as a set-valued Bellman principle. And a more general structure emerges that might also be important for other applications and is interesting in itself. In this talk I will show that this set-valued Bellman principle holds also for the dynamic mean-risk portfolio optimization problem. In most of the literature, the Markowitz problem is scalarized and it is well known that this scalarized problem does not satisfy the (scalar) Bellman principle. However, when we do not scalarize the problem, but leave it in its original form as a vector optimization problem, the upper images, whose boundary is the efficient frontier, recurse backwards in time under very mild assumptions. I will present conditions under which this recursion can be exploited directly to compute a solution in the spirit of dynamic programming and will state some open problems and challenges for the general case.