Michigan Mathematics
Alexander Ziwet Lectures

Professor Ioannis Karatzas
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Some Stochastic Control Problems in Mathematical Finance
Tuesday, November 18 • 4:10 p.m. • Room 1360 East Hall

We formulate and review a class of stochastic control problems, collectively known under the rubric of
“portfolio optimization”, that arise in the mathematics of finance. Ideas from convex duality play a prominent
role in the resolution of these problems; so does the theory of parabolic partial differential equations, under
certain strong conditions on the financial market structure. Under less stringent conditions, stochastic analogues
of the classical Hamilton-Jacobi-Bellman equation emerge as particularly relevant in this context, in connection
with ideas and results from ‘backwards’ stochastic equations and the Itô-Wentzell formula for random fields.
Using such tools, feedback formulae become available for the investor’s optimal strategies, based on his current
level of wealth. Recent progress on these issues will be surveyed, and some open questions will be mentioned.

Volatility Stabilization, Diversity and Arbitrage
Wednesday, November 19 • 3:10 p.m. • Room 3088 East Hall

Optimal Arbitrage
Thursday, November 20 • 3:10 p.m. • Room 3088 East Hall

A reception for Professor Karatzas will be held at 5:00 p.m.
Tuesday, November 18, in the Mathematics Upper Atrium, East Hall

The Ziwet Lectures were established in 1934 through a bequest from Professor Alexander Ziwet, a faculty member and Chair of the
UM Department of Mathematics from 1888-1925. He stipulated that his estate “should be used for the promotion of scientific work.”
The Ziwet lectures are one of the most prestigious lectures series in the Department.