

March 30, 2026  
2:00pm-3:00pm  
KAP 414

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### Distribution-Based Optimal Asset Selling Under Ruin

**Abstract:** This talk studies the distribution-based optimal asset selling problem within the distribution builder framework. This approach allows investors to express preferences over terminal wealth distributions directly, without specifying a utility function, which is especially useful when preferences are ambiguous or difficult to quantify. From a mathematical perspective, the problem is closely related to the Skorokhod embedding problem, in which one seeks a stopping time that realizes a prescribed target distribution. We extend this framework by incorporating ruin, a central concept in classical risk theory. In particular, we consider a diffusion risk model and characterize the class of wealth distributions that can be attained before ruin occurs. Building on this characterization, we then address two optimization problems: how to modify a desired but unattainable distribution into a nearby attainable one, and how to improve an attainable distribution under first-order stochastic dominance. Both problems are formulated as constrained convex optimization problems. We also discuss analytical and numerical examples based on several statistical distances that describe the difference between the original and modified distributions, including f-divergence and Wasserstein distance.

**Zoom Link:** USC Math Finance Colloquium

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