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High-dimensional open markets in stochastic portfolio theory

Stochastic portfolio theory studies investments in large equity markets. Such investments are frequently confined to an "open market": a high capitalization investment-grade subset of a much broader equity universe. We develop models for open markets which (i) are consistent with a given invariant distribution of relative market capitalizations, (ii) lead to explicit growth-optimal portfolios, (iii) are robust to the dimensionality and specific characteristics of lower-capitalization stocks outside the investment-grade subset, and (iv) serve as a worst-case model for a robust asymptotic growth maximization problem that incorporates model ambiguity. (Joint work with David Itkin.)