Quantitative Finance > Portfolio Management

Transaction Costs, Shadow Prices, and Connections to Duality

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For portfolio choice problems with proportional transaction costs, we discuss whether or not there exists a shadow price, i.e., a least favorable frictionless market extension leading to the same optimal strategy and utility. By means of an explicit counter-example, we show that shadow prices may fail to exist even in seemingly perfectly benign situations, i.e., for a log-investor trading in an arbitrage-free market with bounded prices and constant transaction costs of arbitrary size. We also clarify the connection between shadow prices and duality theory. Whereas dual minimizers need not lead to shadow prices in the above "global" sense, we show that they always correspond to a "local" version.

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