Illiquidity, Position Limits, and Optimal Investment for Mutual Funds

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We consider a fund that can trade a liquid stock and an illiquid stock that is subject to proportional transaction costs. The percentage of capital allocated to the illiquid stock is restricted to remain between a lower bound and an upper bound. Mathematically it is a singular stochastic control problem with state constraints. In terms of a connection between singular control and optimal stopping, we characterize the optimal trading strategy for the illiquid stock which is determined by the optimal buy boundary and the optimal sell boundary between which no transaction occurs. An extensive numerical analysis on trading strategies, liquidity premium, and diversification is conducted as well. In particular, we reveal that the presence of portfolio constraints can significantly magnify the effect of transaction costs on liquidity premium and can make it more than a first-order effect.

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This work is joint with Hanqing Jin and Hong Liu.