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**Paul Gassiat, Huyen Pham and Mihai Sirbu\*** ([sirbu@math.utexas.edu](mailto:sirbu@math.utexas.edu)), 1 University Avenue, C1200, Austin, TX 78712. *Optimal investment on finite horizon with random discrete order flow in illiquid markets.*

We study the problem of optimal portfolio selection in an illiquid market with discrete order flow. In this market, bids and offers are not available at any time but trading occurs more frequently near a terminal horizon. The investor can observe and trade the risky asset only at exogenous random times corresponding to the order flow given by an inhomogenous Poisson process. By using a direct dynamic programming approach, we first derive and solve the fixed point dynamic programming equation and then perform a verification argument which provides the existence and characterization of optimal trading strategies. We prove the convergence of the optimal performance, when the deterministic intensity of the order flow approaches infinity at any time, to the optimal expected utility for an investor trading continuously in a perfectly liquid market model with no-short sale constraints. (Received February 22, 2010)