

Algorithmic Pricing and Liquidity in Securities Markets

Jean-Édouard Colliard

Abstract :

We let "Algorithmic Market-Makers" (AMMs), using Q-learning algorithms, choose prices for a risky asset when their clients are privately informed about the asset payoff. We find that AMMs learn to cope with adverse selection and to update their prices after observing trades, as predicted by economic theory. However, in contrast to theory, AMMs charge a mark-up over the competitive price, which declines with the number of AMMs. Interestingly, markups tend to decrease with AMMs' exposure to adverse selection. Accordingly, the sensitivity of quotes to trades is stronger than that predicted by theory and AMMs' quotes become less competitive over time as asymmetric information declines.