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## The Role of Algorithmic Trading in Stock Liquidity and Commonality in Electronic Limit Order Markets

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### Abstract

Using the adoption of the Arrowhead trading platform in January 2010 as an exogenous event, we investigate the effects of algorithmic trading on stock market liquidity and commonality in liquidity under different market conditions on the Tokyo Stock Exchange. After controlling for endogeneity, we find algorithmic trading increases stock liquidity by narrowing spreads and increasing market depth. Furthermore, algorithmic trading increases commonality in liquidity at both high and low frequency. These findings appear to arise due to the reduction in monitoring costs. Further analysis reveals that, following large market declines, the effect of algorithmic trading on spreads and market depth weakens while the effect on commonality in stock liquidity intensifies.

**Keyword:** Algorithmic trading, Liquidity, Commonality in liquidity, Market decline

**JEL Classification:** G14, G24

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