Chapter 9
The Role of Algorithmic Trading in Shaping Futures Market Efficiency: A Review of Recent Research

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ABSTRACT

This systematic review investigates the transformative impact of algorithmic trading (AT) on the efficiency of futures markets, integrating insights from contemporary research. Through the examination of 291 academic publications, predominantly peer-reviewed articles, the review demonstrates that AT generally improves market

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efficiency by expediting information processing, reducing bid-ask spreads, and enhancing liquidity. However, issues related to high-frequency trading (HFT) persist, given its capacity to increase short-term volatility and destabilise markets during stress. Moreover, cluster analysis underscores algorithmic trading and financial markets as significant research areas, with increasing focus on GARCH models, investor sentiment, and attention metrics. The identified gaps in the existing literature, particularly concerning long-term impacts and cross-market dynamics, emphasise the necessity for future investigations utilising advanced methodologies such as machine learning to gain a deeper understanding of AT's evolving significance.

1. BACKGROUND ON ALGORITHMIC TRADING:

Algorithmic trading has become a game changer in financial markets because it involves the use of computer programs to trade on different markets. Once a result of technological trends, today, it accounts for a proportional share of international commerce. These algorithms parse through vast data sets, make decisions within mere milliseconds of a change in market signals, and only execute trades according to conditions predetermined by the algorithm; in terms of speed and precision, automated trading holds great benefits over manual. Algorithmic trading minimises the impact due to several factors, such as emotions not influencing them (Handro & Dima, 2024).

Another advantage of algorithmic trading is the speed achieved, which is paramount in one subfield, high-frequency trading (HFT); that is, algorithmic trading that targets minuscule price differences measured in fractions of a second. In order to trade quickly, technological firms specialising in HFT employ probably computers and servers to lessen latency; their servers are often set close to those of the exchange. The edge is in near real-time response to market signals because a millisecond difference could prove expensive. Despite the fact that HFT has been very beneficial for making money, HFT has been causing some arguments over its capacity to provide unfair opportunities and market instability (Hansen, 2024).

The other benefit is that some companies are capable of handling many trades without affecting the market greatly. Large orders are fragmented into smaller portions that are executed on the market at different times, assuring limited market effects. There is what is referred to as order slicing, which enables the institution to complete large trades without ballooning the market. Further, algorithmic trading allows a range of strategies, from mean reversion to multiple arbitrage strategies and momentum trading. For example, arbitrage bots can engage in the purchase and sale of related trade assets in various markets and profit from the variations in the price