Executive Summary

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Trading Volume Alpha

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This research demonstrates that predicting individual stock trading volume using machine learning techniques can significantly enhance portfolio performance by mitigating trading costs and maximizing after-cost return. We focus on a component of portfolio optimization that is critical yet less studied in academic research—trading costs. Predicting trading costs is challenging because costs depend on trade size and trader identity, thus impeding a generic solution. We focus on a component of trading costs that applies universally—trading volume. Individual stock trading volume is highly predictable, especially with machine learning. We model the economic benefits of predicting volume through a portfolio framework that trades off tracking error versus net-of-cost performance—translating volume prediction into net-of-cost alpha. The economic benefits of predicting individual stock volume are as large as those from stock return predictability. Thereby, we term this new approach that offers a novel source of investment edge as "trading volume alpha."

This paper demonstrates the economic value of incorporating trading volume forecasts into investment decisions, which is a particularly relevant message to large portfolio managers, for whom trading costs can significantly impact performance. It offers actionable insights to better manage the trade-off between trading costs and portfolio returns, ultimately contributing to more robust and resilient investment outcomes. By leveraging widely available trading volume data and state-of-the-art machine learning models, the framework proposed in this paper offers a scalable and adaptable approach that can be applied across different asset classes and market conditions. The quantitative results from extensive data construction, machine learning implementation, and empirical experiments provide clear demonstrations of the economic benefits of trading volume prediction, which can be used as benchmarks for interested practitioners to evaluate the potential value of incorporating trading volume forecasts into their specific investment practices.