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Detection of algorithmic trading

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Abstract

We develop a new approach to reflect the behavior of algorithmic traders. Specifically, we provide an analytical and tractable way to infer patterns of quote volatility and price momentum consistent with different types of strategies employed by algorithmic traders, and we propose two ratios to quantify these patterns. Quote volatility ratio is based on the rate of oscillation of the best ask and best bid quotes over an extremely short period of time; whereas price momentum ratio is based on identifying patterns of rapid upward or downward movement in prices. The two ratios are evaluated across several asset classes. We further run a two-stage Artificial Neural Network experiment on the quote volatility ratio; the first stage is used to detect the quote volatility patterns resulting from algorithmic activity, while the second is used to validate the quality of signal detection provided by our measure.

Keywords: `algorithmic trading patterns, quote volatility, price momentum, Artificial Neural Network`

1. Introduction

Over the past decade, technological innovations and changes in financial regulation, e.g. Regulation National Market System in the US, and the MiFiD in Europe, have induced trading to become more automated. This evolution led to changes in the way the information is disseminated to traders. Specifically,

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