

## Accepted Manuscript

Detection of algorithmic trading

Dimitar Bogoev, Arzé Karam

PII: S0378-4371(17)30467-3

DOI: <http://dx.doi.org/10.1016/j.physa.2017.04.157>

Reference: PHYSA 18259

To appear in: *Physica A*

Received date: 24 November 2016

Revised date: 26 April 2017

Please cite this article as: D. Bogoev, A. Karam, Detection of algorithmic trading, *Physica A* (2017), <http://dx.doi.org/10.1016/j.physa.2017.04.157>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



# Detection of algorithmic trading

Dimitar Bogoev<sup>a</sup>, Arzé Karam<sup>b,\*</sup>

<sup>a</sup>*Durham University, Mill Hill Lane, Durham DH1 3LB, England.*

<sup>b</sup>*Durham University, Mill Hill Lane, Durham DH1 3LB, England.*

---

## 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,

---

\*Corresponding author

Email address: arze.karam@durham.ac.uk (Arzé Karam)

Download English Version:

<https://daneshyari.com/en/article/5102710>

Download Persian Version:

<https://daneshyari.com/article/5102710>

[Daneshyari.com](https://daneshyari.com)