

## HIGH FREQUENCY TRADING: HIGHWAY TO FINANCIAL HELL OR ECONOMIC SALVATION : A COMPREHENSIVE REVIEW OF THE HIGH FREQUENCY TRADING LITERATURE

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### Abstract:

Stock trading has been for many years a vital part of financial trade and economic development. In trading it is essential to not just make the right decision but also at the right time. This means that if a trader is too late with a buy or sell order, she might suffer the financial consequences. The vision of screaming and stressing stock traders on the stock exchange floor is familiar to everyone. With the onset of computer technology and its steady development over the past few decades, hardware and software facilitated trading have also been on the rise. As traditional stock trading done by traders involves buy and sell orders that are decided on by humans, computer aided trading was found to be much quicker since computer algorithms can analyze the movements of the market and decide on the desired course of action within a fraction of a second. Over the last decade it has become apparent that due to the speed of the decision making of algorithms they can also be used in order to influence the market and the trend of any stock. This feature of high frequency trading has been used in several high profile cases to illegally influence stock prices. However, other than that, there are very few comprehensive studies that explain and combine most of the aspects of algorithmic trading and High Frequency Traders (HFTs). This thesis gives an overview of the development of High Frequency Trading, its influence on the market, a model of the interactions between an HFT and other traders and the possible future developments. Additionally, we present a model which an HFT might use in a realistic trading situation when squaring off against other traders. The thesis is divided in chapters that will treat the following topics: Chapter 1 introduces the thesis and provides the general outline and purpose of the study. Chapter 2 provides an overview of the history of the stock exchange from the early beginnings till algorithmic trading. Chapter 3 discusses the differences between continuous and discrete time in games that can occur and additionally argues as to which time an HFT is following. Chapter 4 focusses on the various market participants that can be found on the stock exchange. In Chapter 5 the market structure is explained, a detailed description is given of the most common types of market orders and the workings of the Limit Order Book. Chapter 6 gives an in depth overview of the various strategies that can be followed by an HFT. Chapter 7 explores various game scenarios that can happen between HFTs and the other market participants, in addition in this chapter a model for the subsequent game is introduced. In Chapter 8 the advantages and disadvantages of having an HFT present on the market are discussed. In Chapter 9 the potential future of High Frequency Trading is explored. Finally, Chapter 10 elaborates in more detail on some key discussion points mentioned throughout the thesis and gives potential topics for future study.

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