Empirical Case Study of Binary Options Trading: An Interdisciplinary Application of Telecommunications Methodology to Financial Economics

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Abstract

This paper presents an interdisciplinary application of information & communication methodology to financial economics. The empirical case study reported in this contribution consists of a preliminary example of binary options stock trading. The authors have investigated the performance of a simple algorithm which includes one buy/sell order per week. They have analyzed real sets of historical stock quotes, evidencing the asymmetry of achievable economic returns. In fact, the devised algorithm has denoted a (simulated) overall trading gain in the 87% of cases. A discussion, correlating such trend to the typical behavior of occasional traders, is finally reported

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Introduction And Motivations

In the last years, there has been an explosive growth in the research area relating economics and mathematical modeling (Gradojevic & Gencay, 2011; Bekiros, 2011), especially in the fields of business and banking researches and applications (Nair *et al.*, 2010; Liu & Xiao, 2009; Taskaya & Ahmad, 2003; Nuti *et al.*, 2011). However, it is more important to dynamically follow the non-stationary processes' fluctuations to provide optimal information for automatic trading, than statistically modeling data sequences (Ehlers, 2001; Zhang & Kedmey, 2011). In fact, stock traders usually try to profit from short-term price volatility with trades lasting anywhere, from several seconds to several weeks (Wikipedia, 2012a).

The increasing development of on-line trading and Internet banking have boosted the growth of proprietary methods (Slamka *et al.*, in press). In this sense and according to (Tsakalozos *et al.*, 2011), *we do not know what we do not know*. Among the proprietary algorithms based on heuristic concepts, one popular trading strategy is binary option trading (Raw, 2008). *In finance, a binary option is a type of option where the payoff is either some fixed amount of some asset or nothing at all* (Wikipedia, 2012b). We have searched through the literature and we have found that a Google search with the queries ´"Telecommunications" + "binary option"´ returns zero results (Google, 2012). In most specific database of IEEE Xplore, there are two papers found with the query "binary options" (IEEE, 2012): namely Wang *et al.* (1998) and Yuan and Xiao (2011). But the paper (Wang *et al.*, 1998) deals with binary options meaning the classical *binary hypothesis testing*. Hence, Yuan and Xiao (2011) is the only paper about binary options from the economic viewpoint, in the IEEE database. In particular, the authors in Yuan and Xiao (2011) present a new numerical method for pricing binary options, showing with numerical examples that the proposed algorithm is conditional stable and convergent. The binary options trading is becoming more and more popular because it provides easy indications to operate in a dynamic manner, and suited to occasional operators that usually trade by their remote Internet on-line platforms.

This paper aims to highlight the huge possibility in exploiting telecommunication methodologies in synergy with stock trading, showing an empirical case study. We propose to exploit the hidden market trends of stock prices (Drakakis, 2009) for application to stock trading. In particular, our case study consists of a preliminary example of trading stocks with a simple algorithm for binary options, which includes one buy / sell order for week of a fixed amount of cash (or exchange equivalent) to limit the maximum risk of the investment to that fixed amount. The advantage of using a simple trading model reflects in the fact that the performance evaluation is straightforwardly based on the return in terms of cash and stock portfolios at the end of the trading session.

The remainder of this work is organized as follows. First we detail the proposed data processing technique for financial stock trading, and then we discuss a case study reported along with the results' discussion. Our discussion and conclusions are finally depicted in the last section.

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