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IMPROVEMENT OF TRADING SYSTEMS IN THE STOCK MARKET

R. Azimjonova

Abstract
This scientific article is devoted to analyzing the influence of financial risks on stock market trading systems, modern development of Internet trading, use of the latest information technologies in stock markets. Examples of positive and negative consequences of using modern developments in the stock market were highlighted.

Keywords: Financial risk, trading, stock market, exchange, artificial intelligence, investment.

Introduction:

Trading systems in the stock market are mechanisms and platforms that manage the process of exchanging or buying and selling stock between investors and traders. Such systems are necessary to ensure the efficiency, transparency and fairness of the market. There are different types of trading systems in the stock market, and they have the following main aspects:
Stock trading is a centralized system where investors and traders buy and sell stock based on set rules and protocols. Trading in such systems is transparent and open, and often under strict control. Examples of the most popular exchanges in the world:
1) New York Stock Exchange (NYSE);
2) NASDAQ;
3) London Stock Exchange (LSE);
4) Tokyo Stock Exchange (TSE).
An Over-the-Counter market is a decentralized trading system where investors and traders trade directly. This market is different from the stock exchange system, where stock are traded between brokers, trading firms, or other financial institutions rather than through an exchange. The OTC market is less regulated and is used for smaller companies or stock. Examples:
1) OTC Bulletin Board (OTCBB);
2) Pink Sheets.
These systems are an electronic form of trading and provide fast and efficient exchange of stock between traders through a computer network. ETS, unlike exchange systems, often provide a decentralized and automated form of trading. Some examples of e-commerce systems include:
1) NASDAQ;
2) Instinct;
3) TradeWeb.
Alternative trading systems are non-exchange trading systems. ATSs are platforms that are often outside of stock markets but they are regulated by regulators and provide transparent trading in investors. ATSs carry a large volume of trades and they are often designed for professional investors. Examples:
1) Chi-X;
2) BATS Global Markets.

A dark pool is a secret trading system that is often used to sell large amounts of shares by a particular team or group. Dark pools are designed so that trades are not visible on the stock exchange and do not affect market prices. These systems are mainly used by institutional investors.

Automated trading is a trading process which is carried out using computer algorithms. Algorithms analyze market data and send trade orders based on a specific strategy. These systems make it possible to trade quickly and efficiently, as well as take advantage of small price changes in the market.

The main aspects of trading systems:

Liquidity: Exchange systems can provide a high level of liquidity because they involve many investors and traders.

Transparency: Exchange systems usually conduct trades in an open manner, which is more reliable for investors.

Pricing: Trading systems use different methods to set prices: in exchange systems, prices may be open, while in OTC markets, prices are often set based on private agreements.

Oversight and Regulation: Exchange systems are often heavily monitored by financial regulators, while ATS and OTC markets are in some cases less regulated. Effective operation of trading systems in the stock market helps to stabilize the market, create opportunities for investors and manage capital flows.

Literature Review

During the writing of the scientific article, scientific and practical research on the improvement of trading systems of the stock market was carried out by a number of foreign scientists. In particular, N.I.Berzon,

B.B.Rubsov, Ya.M.Mirkin, E.V.Boland, I.Walter, R.Smith, B.Steil, J.Tirole and others.

Economist N.I.Berzon made in this work, a deep analysis of the structure of the stock market, its working mechanisms, laws and economic significance[1]. This work of N.I.Berzon is one of the first works of great importance, especially in the study of the stock market and its practical aspects. He explained the theoretical foundations of the stock market, their types, and the economic role of the market.

B.B.Rubsov explains the operation of the stock market in the economy, its structure, types and functions in his “Fundamentals of the Stock Market” on stock. B.B.Rubsov is one of the scientists who created theoretical foundations in this field.[2]

Ya.M.Mirkin wrote about stocks in his book “The Stock Market”[3]. This work provides an in-depth analysis of the concepts of economic theory and practice, the functions of the stock market and the factors affecting it. This work served as a useful resource for stock traders at that time.

E.V.Boland is an economist and financial expert whose most famous work on stock is “The Stock Market”[4], which is a study of the stock market and its impact on economic processes. Contains scientific and practical information about the structure of the stock market, its different types, the relationship between investors and sellers, and the efficiency of the market. This work is a valuable resource for economists and financial professionals.

[1] https://books.google.co.uz/books/about/Инновации_на_финансов.html?id=gKpR0AEACAAJ&redir_esc=y
[2] Мировые рынки ценных бумаг / Б.Б. Рубцов - М.: «Издательство «Экзамен», 2002. - 448 с.
[3] https://www.amazon.com/Books-V-Ya-MirkinM/s?rh=n%3A2155%2Cp_27%3AV.+Ya.+Mirkin+Ya.+M.+Mirkin
[4] https://www.businesspost.ie/analysis-opinion/vincent-boland-yes-the-value-of-stock-markets-are-soaring-yet-ipos-are-in-steep-decline/

I.Walter, R.Smith, B.Steil, J.Tirole are authors who have written several important works on stock (stock market, investments, and finance). Some of their works include:

I.Walter and R.Smith: "Corporate Finance" - This work provides a comprehensive understanding of corporate finance, stock and investment management. The work examines financial decisions and investment strategies for companies.[1]

B.Steil: "The Globalization of Finance".[2] This work talks about the development of the global financial system and how the stock market is undergoing changes on a global scale.

J.Tirole: "The Theory of Corporate Finance"[3]. This work provides information on the main theories of corporate finance, including issues related to stocks.

The above works cover a variety of important stock issues: investments, corporate finance, stock market structure, and other financial decisions.

Methodology

Description of the methodology used in the research. The methods of analysis and synthesis, analogy are used in the master's thesis work.

Analyze

First of all, I will try to cover this topic in connection with financial risks. The main risks related to the improvement of stock market trading systems can be as follows:

1. Technological risks: Technological risks associated with the development of trading systems can be related to market infrastructure failures, software errors or cyber security threats. As trading systems are updated, these technological risk factors are likely to increase.
2. Operational risks: Any changes made to trading systems may cause errors or interruptions in operational processes. Incorrect or delayed transactions due to trading system outages or errors can be harmful to market participants.
3. Systematic Risks: Improved market trading systems can create more dependence. If a series of problems occurs in a system, it can affect other systems and harm the overall functioning of the market.
4. Liquidity risks: In the process of improvement, some trading tools or systems may stop temporarily or permanently, which may increase the possibility of a decrease in market liquidity. This leads to limited trading opportunities for investors and lack of liquidity in markets.
5. Regulatory risks: Renewal or improvement of trading systems may lead to the introduction of additional requirements or regulations by market regulatory organizations. Violation of these requirements may result in serious fines or legal problems.

Assessing and managing these risks is important in the process of improving trading systems.

In addition to the above, I note the following. A stock is a document certifying, in compliance with the established form and mandatory requisites, property rights, the exercise or transfer of which is possible only upon its presentation.[4]

[1] https://www.econ.cam.ac.uk/people/emeritus/rjs27
[2] https://www.researchgate.net/publication/270197007_Financial_Statecraft_The_Role_of_Financial_Markets_in_
[3] The theory of corporate finance / Jean Tirole. p. cm. Includes bibliographical references and index. ISBN-13: 978-0-691-12556-2
[4] https://ru.wikipedia.org/wiki/%D0%A6%D0%B5%D0%BD%D0%BD%D0%B0%D1%8F_%D0%B1%D1%83%D0%BC%D0%B0%D0%B3%D0%B0

The impact of financial risks on the stock market is an important topic for economic and financial systems. Risks in financial markets can have a significant impact on stock prices and overall market activity. To understand how financial risks affect the market, it is necessary to consider their main types and how they are manifested in the stock market.

Market risk is the risk arising from general price changes or volatility in the market. For example, fluctuating interest rates, falling or rising stock and bond prices. In the stock market, market risks are usually caused by factors such as global and local economic conditions, political events or natural disasters.

Credit risk is the risk that the holder of a stock will not make a payment from a debtor company or government. For example, in the bond market, if the issuer defaults on its debt, the price of the bond can fall sharply.

Liquidity risk is the risk that investors may not sell their stock quickly and at the right price. Liquidity risk in the stock market can be particularly high for stocks or bonds that are less traded.

This is the risk caused by errors in the company's internal systems or processes, network disruptions, fraud or errors. Operational risks in the stock market include issues such as transaction errors, data mishandling or system failures.

Political problems, government policy changes, economic sanctions or geopolitical crises can increase risks in the stock market.

New government regulations or changes in fiscal policy can cause major fluctuations in the stock market.

Financial risks directly affect stock prices. For example, rising interest rates lower bond prices, while in the stock market, economic hardship or political uncertainty can cause prices to fall sharply. The increase in risk creates higher volatility for markets in particular. The increase in investment risks increases the fluctuations in the prices of stock. This can cause investors to worry and lead to uncertainty in the market. Financial risks can harm investors, especially those making short-term investments. For example, rising interest rates lower bond prices and devalue the stocks of companies with lower dividend payments. Credit risk and liquidity risk affect the ability of banks or other financial institutions to lend. Creditors and investors are not being paid by debtors makes the market more uncertain. Financial risks affect investors' portfolio management strategies. To reduce risks, it is required to develop strategies such as diversification of investments, avoidance of risky stock or risk insurance.

The impact of financial risks on the stock market depends on many factors, creating constant risks for the markets. However, understanding and managing these risks, investors can protect their portfolios and strategies. It is important to diversify risks, make optimal investment decisions and carefully monitor market conditions.

The stock market is an economic market where stocks (shares, bonds, certificates of deposit, mutual funds, etc.) are bought and sold for investment purposes. This market is an important tool for investors to invest in financial assets, as well as for companies and governments to raise their own capital.

The stock market can be divided into two main types:

Stock market - Stock are traded through the stock exchange (for example, Tashkent Stock Exchange, New York Stock Exchange, London Stock Exchange). In this case, trades are strictly regulated and every transaction is carried out openly. Over-the-Counter Market - in this market, trades are made through

brokers or other financial institutions rather than through an exchange. In this case, the sales terms and prices are more based on personal agreement. Functions of stock market:

Companies and governments raise money to grow their businesses. Investors invest in stocks to grow their capital.

The stock market provides an opportunity for investors to buy or sell their investments.

The price of stock in the market is formed on the basis of demand and supply, which stimulates competition in the market. Investors often need to be financially literate, assess risks, and be prepared for market changes in order to operate in the stock market.

Besides, there are other issues that I need to touch on. In particular, many previously unrealizable opportunities and new trading instruments have appeared, which are widely used on stock exchanges. In particular, it has become possible to create and use not only mechanical, but also automatic trading systems that operate without human intervention. We are not talking about exchange or over-the-counter trading systems, but about individual trading systems, with the help of which stock are bought and sold by individual market participants. The modern development of Internet trading (sale and purchase of financial instruments) is currently undergoing significant changes. Over the long years of trading on the stock market, investors and speculators have developed certain traditions and trading skills that strictly fit into the concepts of fundamental and technical analysis. But as practice and experience in the stock market show, the proposed approaches do not have general universality and clear formalization. Attempts have long been made to create so-called mechanical trading systems, but, as a rule, such systems are also not universal enough, although they bring the expected profit. Today, broad prospects are opening up for a modern trader, thanks to the development of information computing systems and technologies.

So, if the first investors had to calculate each formula manually, and draw each chart on graph paper, today, with the development of computing technology, investors have the opportunity not only to simplify the trading procedure itself, but also to make it more efficient and profitable. The use of the latest artificial intelligence technologies is especially relevant and interesting for trading on the stock market. Such interest in such artificial intelligence applications is shown by both the creators of artificial intelligence systems and their potential users - financial organizations and individuals engaged in operations in these markets. This happens because, on the one hand, forecasting the dynamics of the market - a system that adjusts its behavior depending on its own history, is perhaps one of the most difficult existing tasks and that is therefore perceived as a challenge to the omnipotence of mathematics, statistics and modern computer technology, and on the other - the results of even a small increase in the efficiency of portfolio management compared to average market values can immediately turn out to be very significant.

Trade management includes: risk, profit, capital and position management. If the indicators of one of the ATS go beyond the specified confidence interval or there is a strong drawdown of capital, then a response reaction follows, for example, the investment size for this ATS decreases and the investment size for more successful ATS increases. Additional trading conditions that must be taken into account may be: significant dates, overnight closings, spread, gap, checking the reality of prices and price movement limits, reaction to news, and lack of communication. Various types of exchanges use software packages, “robots”, which allow you to automate the buying/selling process. Large exchanges, large companies use very expensive software packages, costing many millions of dollars. Such packages

justify their cost, earning their owners tens and hundreds of millions of dollars. But sometimes automation can lead to trouble. Goldman Sachs' internal system that helps traders calculate prices at which to buy or sell options suddenly malfunctioned, causing thousands of unprofitable buy and sell trades for the company.

The transactions took place on three major stock exchanges - NASDAQ OMX, NYSE Euronext and Chicago Board Options Exchange (CBOE) from 9.30 to 9.47 am. Goldman Sachs managed to cope with the system failure and is now trying to determine its causes. Exchanges are forced to revise morning transactions with tickers from H to L. Of the 500 largest options transactions in the first minutes of the market opening, 405 were with tickers from H to L and with a price of 1$. The failure may have affected 400 thousand contracts of companies such as JP Morgan Chase, Johnson & Johnson, Kellogg and others.[1] However, some experts believe that Goldman Sachs got off easy. Those companies and traders who managed to conclude transactions with Goldman Sachs and hedge their options were hit. System failures in companies trading on the stock exchange are not the first time, the stock "robot" of the company Knight Capital Group began to uncontrollably buy up shares of various companies, including RadioShack, Ford Motor Company and American Airlines. The trading bacchanalia of the machine lasted only 45 minutes. After that, the company tried to sell off the unwanted stock packages as quickly as possible. Having calculated the costs of buying the shares, and then the proceeds from the sale, the company was short 440 million dollars.

A little later, the company reported that the assets of its clients were not affected. The reason for such "successful" trading, according to the company's representatives, is new software that was recently installed. This is four times more than the profit the company received in 2011. The losses are so great that the company experienced serious difficulties in further conducting business. It is worth noting that Knight Capital Group has previously repeatedly spoken out in favor of using stock robots and other software packages in stock trading. Moreover, the management of this company can be called a group of enthusiasts who promoted the idea of automation of stock trading. The management of the company believed that automation would help Knight Capital Group to surpass all its competitors. In May of the same year, the social network Facebook had technical problems when placing shares, which led to losses of 500 million $ for Wall Street companies.

One of the most common schemes on the market is the artificial change of prices for a stock by placing false orders (Spoofing strategy - imitation of an order). For example, a dishonest participant places false large orders to sell - this leads to a decrease in the price. As a result, trading robots of other participants, taking into account the supply volume of a given security on the exchange, begin to sell it. This gives the robot the opportunity to buy it cheaper. There are other ways to make money on high-frequency trading: in particular, one of the common practices is Front-running (anticipating an order). the famous "Black Thursday" that occurred in May 2010 on the US stock market and was called Flash Crash is associated with manipulations by one of the traders of futures contracts on the S&P500 index. The participant used the Spoofing strategy and managed to collapse the Dow Jones index by almost 1 thousand points in a few minutes. This led to a fall in the entire currency market and colossal losses for investors around the world.

[1] NYSE Rule 80A.40(b) Index Arbitrage Trading Restrictions // http://www.nyse.com/glossary/10422359957 60.html.

To prevent such situations, most European countries and the United States have introduced restrictions on the use of HFT strategies.

In particular, the Dodd-Frank Act, which prohibits the Spoofing strategy, has been in effect in the United States since 2010. Since 2003, the definition of market manipulation in European stock markets includes actions by market participants whose orders led to a change in the price of a security and were withdrawn before their execution. Since 2016, an automatic monitoring system that identifies unfair algorithmic trading will be launched in Europe not only on stock markets, but also on over-the-counter platforms, while any strategies aimed at destabilizing and slowing down the trading system will fall under the law on manipulation.[1]

I am talking about the practice of high-frequency trading (HFT), which is used in trading by market participants. Thanks to special algorithmic programs (robots) that allow a transaction to be carried out in a fraction of a second, brokers can sell or buy a stock faster than most other participants and make a profit on minor movements in quotes. Hunting for robots. In Uzbekistan, there are currently no restrictions for market participants using Spoofing, Front running and other strategies in their activities that allow manipulating prices on the market. However, the situation may change by the end of the year. In addition, these participants may have their access to trading restricted or completely closed. “The exchange may apply these measures to market participants who repeatedly or over a short period of time submitted and withdrew applications to buy or sell a stock, which led to a change in its value,” the exchange's materials say. For now, the exchange plans to consider cases of unfair algorithmic trading based on written applications from trading participants, and will introduce an online monitoring system for such transactions as early as early 2016. “The Stock Market Committee has decided to create a special working group that will develop criteria for the automatic detection of unscrupulous robots,” the exchange's press service reported. It is known that one should not count on serious success in stock trading, having only knowledge of current quotes, prices and one's own intuition.

The issue of program trading and the creation of a domestic scientific base for the development and construction of effective trading systems is very voluminous and insufficiently studied at the moment, despite a large number of studies conducted mostly in financial companies, and is not in educational institutions. Private companies are not interested in disseminating their results and achievements on this topic due to competition. Despite the diversity of approaches, most systems base their work on the analysis of market history.

However, it is obvious that in order for a model built on the basis of past experience to work in the future, it is necessary that the market does not undergo drastic changes for a sufficiently long time, so that the events occurring on it have approximate analogues in the past. For example, many neural network systems require data on the history of the market for at least 3-5 years for their training. That is, it is assumed that for some time the internal laws of market dynamics will not differ significantly from those that have been in effect for the past 3-5 years. It is quite obvious that these conditions are not met for Uzbek financial markets. In addition, neural networks have the disadvantage that it is very difficult to understand, and therefore control, why they make certain decisions, and this reduces the reliability of management in crisis situations, when the influence of external factors are not taken into account by the system is strong. Another Uzbek feature is the lack of a developed system of indices

[1] https://dataprotocol.com/products/1033-compliance?utm_source=google&utm_medium=search&utm_campaign=launch&utm_source=google&utm_medium=cpc&utm_campaign=&gad_source=1

characterizing individual financial instruments, markets and the economy as whole, which are used by trading systems. Therefore, it seems that these and some other reasons make the use of traditional stock portfolio management systems in Uzbek ineffective.

The solution to the problem of effective investments and building an optimal portfolio management strategy can be the Data Mining and Knowledge Discovery technology – data mining (DM) and knowledge discovery. This term refers to a set of methods from the field of artificial intelligence, which has begun to actively develop quite recently. These methods allow extracting previously unknown knowledge about the dependencies and behavior patterns of the described object from raw data (in my case, a description of the history of the market). It should be noted that when trading with automatic trading systems, especially during the day, the first place is not the prospects of the market instrument, but its liquidity and volatility. From the point of view of mechanical speculation, the names of goods (services) and their properties are not important. It is important that the subject of trade is in high demand and constantly changes its value. The stock market in this sense has unique opportunities and prospects.

Conclusion:

In conclusion, if the reforms and changes made to improve the trading systems of the stock market are effective, they will help the market grow and increase stock for investors. Efficient and sustainable systems can support economic growth, increase investor confidence and make the market globally competitive.

References

1. Law of the Republic of Uzbekistan 06.05.2014 No. ORQ-370 “On Amendments and Additions to the Law of the Republic of Uzbekistan “On Protection of the Rights of Joint-Stock Companies and Shareholders”
2. Balsara Nauzer J. Money Management Strategies for Traders. New York: John Wiley & Sons, 1991. P.151-153.
3. Мировые рынки ценных бумаг / Б.Б. Рубцов - М.: «Издательство «Экзамен», 2002. - 448 с
4. The theory of corporate finance / Jean Tirole. p. cm. Includes bibliographical references and index. ISBN-13: 978-0-691-12556-2
5. NYSE Rule 80A.40(b) Index Arbitrage Trading Restrictions // http://www.nyse. com/glossary/1042235995760.html.
6. Federal Register (USA). 2007. April 17. Vol. 72. Num. 73. P. 19225-19227. (from the Federal Register Online via GPO Access. DOCID:fr17ap07-88 // wais.access.gpo.gov).
7. Беляев А., Евтушенко С. Принципы построения механических торговых систем // Валютный спекулянт. 2006. № 6.
8. С.Яшин. Базовые принципы создания торговых автоматов // Валютный спекулянт. 2006. № 5.
9. https://www.researchgate.net/publication/270197007_Financial_Statecraft_T
he_Role_of_Financial_Markets_in_
10. https://books.google.co.uz/books/about/Инновации_на_финансов.html?id=gKpR0AEACAAJ&re
dir_esc=y

11. https://www.businesspost.ie/analysis-opinion/vincent-boland-yes-the-value-of-stock-markets-are-soaring-yet-ipos-are-in-steep-decline/
12. https://www.uz.wikipedia.org
13. https://www.lex.uz