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FINTECH SOLUTIONS AND PRESERVING HUMANITY IN FORMING THE MARKET PRICE OF A FINANCIAL ASSET

SOLUÇÕES DE FINTECH E PRESERVAÇÃO DA HUMANIDADE NA FORMAÇÃO DO PREÇO DE MERCADO DE UM ATIVO FINANCEIRO

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ABSTRACT

The **article aims** to analyze the influence of the categories of emotionality and humanity on artificial intelligence in making fintech decisions.

The **methodology** of this article includes the search for scientific literature and content and comparative analysis. The

Result of the study is the understanding that if a trading robot can do the work of a trader on the stock market, then the use of AI in the calculation system for forming the market price of a financial asset is unacceptable. However, this limitation on the use of AI contradicts the desire of the owners of financial capital to maximize the opportunities for its growth, including through its redistribution in the financial market. The authors draw the following.

Conclusions: digitalization processes in the financial market cause new contradictions that require market participants to find a compromise that does not allow the destruction of the humanity of this market.

Keywords: Digitalization; Artificial intelligence; Fintech solutions; Financial market; Market price; Intelligence.

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RESUMO

O artigo **tem como objetivo analisar a influência das categorias de emocionalidade e humanidade sobre a inteligência artificial na** tomada de decisões em fintechs. A **result** deste artigo inclui a busca de literatura científica e análise de conteúdo e comparativa.

O **resultado** do estudo é o entendimento de que, se um robô de negociação pode fazer o trabalho de um trader no mercado de ações, então o uso da IA no sistema de cálculo para formar o preço de mercado de um ativo financeiro é inaceitável. Entretanto, essa limitação do uso da IA contradiz o desejo dos proprietários do capital financeiro de maximizar as oportunidades de crescimento, inclusive por meio de sua redistribuição no mercado financeiro. Os autores tiram as seguintes

Conclusões: os processos de digitalização no mercado financeiro causam novas contradições que exigem que os participantes do mercado encontrem um meio-termo que não permita a destruição da humanidade desse mercado.

Palavras-chave: Digitalização; Inteligência artificial; Soluções Fintech; Mercado financeiro; Preço de mercado; Inteligência.

1 INTRODUCTION

When talking about fintech solutions in the financial market, we usually refer to the expansion of intellectual and technical capabilities in making deals and conducting operations. The issue of reasonable limits on the use of these new capabilities remains somewhat sidelined, which poses the risk of losing the very essence of the financial market. Technical and other innovations can be applied in various ways and for different purposes, but the final choice of how they are applied remains with society or individuals. This is manifested in the establishment of economic, social, and political restrictions that protect society and the market from the boundless opportunities of technological progress, which is not always beneficial or reasonable. Ultimately, the problem is to ensure that technological progress, including modern digitization, serves the common good as the majority of individual interests rather than the partial interests of small groups. The modern financial market functions because it achieves a balance of interests among most of its participants who hold opposing positions as buyers and sellers.

The main manifestation of fintech solutions in the financial market is the widespread use of digital technologies. Digitalization is the product of man as a spiritual principle and not the product of nature as human beings themselves.

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Digitalization is used for making a profit as a tool for profitable activity or as a product that brings profit.

Trading on the stock market is often robotized. Technically, a trading robot is a unity of a trading strategy (in the form of a computer program), a computer (carrier) in which this program is stored, and a trading terminal that provides communication between the trader's computer and the corresponding stock market. The trading strategy is expressed in the form of mathematical formulas, quantitative restrictions on cash deposits and trading assets, and the possibility of using transactions. The robot can function in different ways, for example, it can work either periodically at set time intervals or continuously for some time.

2 LITERATURE REVIEW

Robots used in stock trading can be classified according to several characteristics, connected with emotionality and perfection (Figures 1-3).

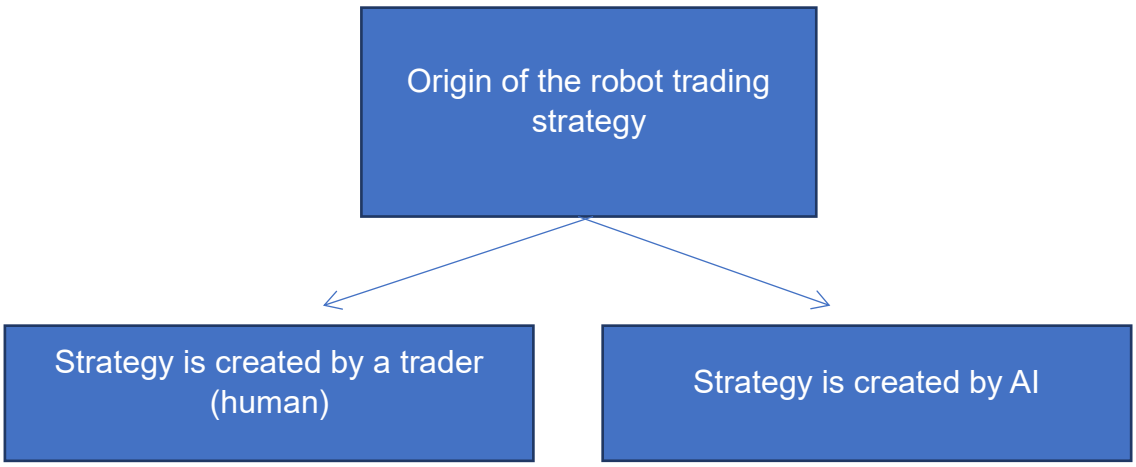

Figure 1. Classification by origin of trading strategy

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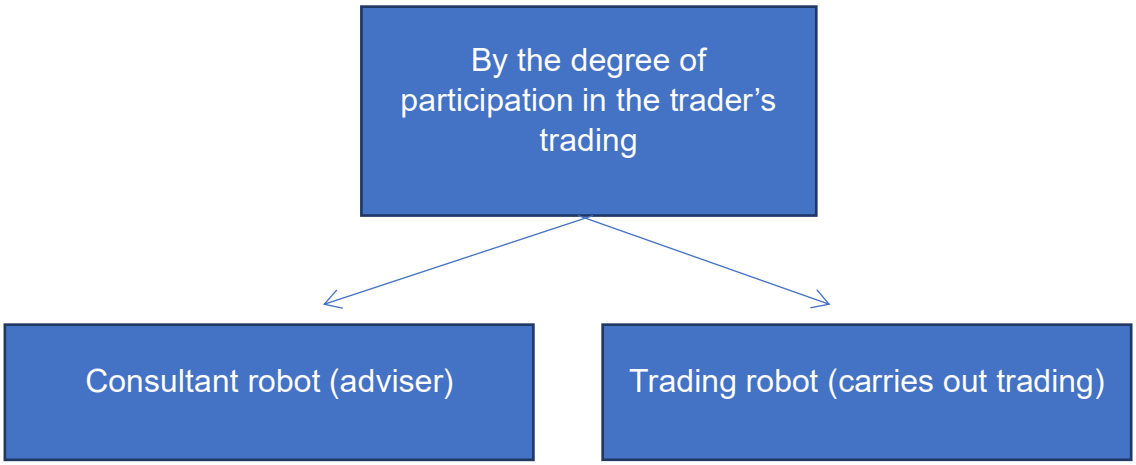

Figure 2. Classification by the degree of robot participation in the trader's trading

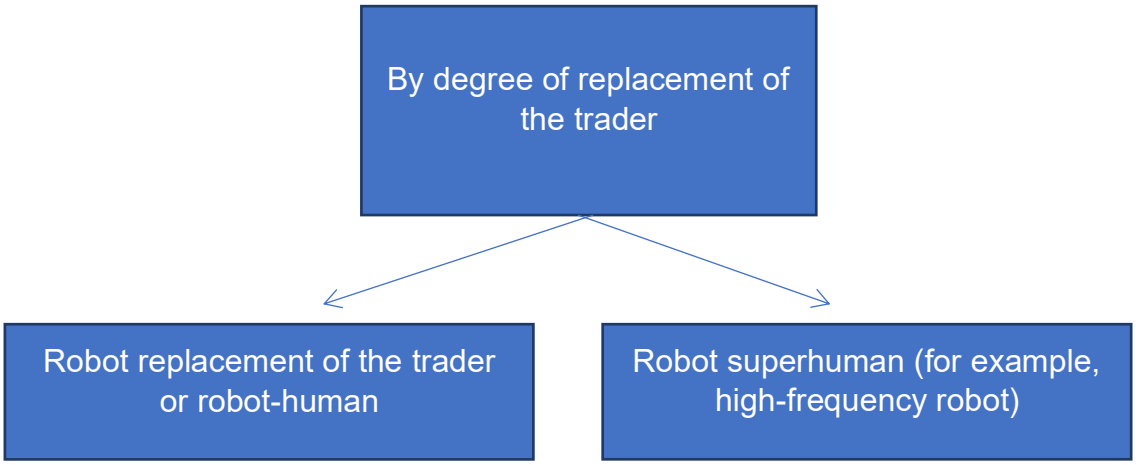

Figure 3. Classification by the degree of replacement of a trader by a robot

The classifications indicate the need to separate the two aspects of the trading robot's capabilities which can be combined in a single machine. A well-developed trading robot is essentially a unity of two types of robots:

a) *Robot as a trader's assistant in the market*. It can be called a "human robot" or "anthropomorphic robot". This is a robot as a simple executor of the trader's will. It facilitates the trader's work, conducting routine operations, freeing up time for analysis and creativity, developing new strategies, etc. In this case, a trading robot is convenient for a trader but does not bring any additional monetary income, i.e., does not make them rich.

The market for trading such robots is also rapidly developing. For marketing purposes, the emphasis is laid not so much on the non-monetary advantages of robots, but on the growing belief that a trading robot will help its owner become richer.

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The main commercial benefit of using such trading robots in the stock market is not enjoyed by their immediate owners or even their sellers and creators, but primarily by the organizers of stock trading and organizations responsible for the accounting of traded assets and funds. The average or mass owner of trading robots predominantly receives non-monetary benefits as no robot can make all traders wealthy. On average, the profits of some traders are offset by the losses of others, and each trader alternates between being in the black and the red at different times. The monetary income of stock trading organizers is directly connected to the scale of securities trading, which increases with the use of trading robots. The larger the share of securities in circulation and the higher the velocity of this circulation, the greater the income of the exchange and its infrastructure. The use of trading robots under current conditions is a major factor in the growth of exchange turnover and the financial income of centralized and decentralized stock markets.

As a rule, a trader operates in the market based on the rules they set for themselves, derived from their own experience and experiences of other traders. These rules collectively form trading strategies. However, there are times when a trader operates without a clearly defined strategy, relying on intuition, rumors, patterns, etc., which cannot be formalized. Intuitive and other non-formalized trading strategies cannot be the basis for the functioning of a trading robot. Not all trading methods on the stock market are suitable for programming. A trading robot can only be built on clear formal rules as informal aspects cannot be programmed. If a trader is a risk-taker by nature, no robot can replace them in the stock market since that would imply the person has abandoned their nature or fundamentally changed their psyche.

b) *Robot as a "superhuman" or "non-human"* is exemplified by high-frequency trading robots. This type of trading robot also executes trades based on the conditions prescribed by its owner. In this case, the trader is no longer able to perform market actions and pre-market activities, such as executing ultra-short trades, simultaneously trading many assets, or analyzing large volumes of information in a short period of time. On the contrary, the robot can. In the further development of the robot as a superhuman, two unequal types of controllers emerge: the owner-trader and artificial intelligence. While a "human robot" is a robot whose market strategies are determined by its creator (person), a "superhuman robot" is a trading robot whose market strategies are determined by AI, and these strategies are no longer accessible for understanding by the robot's owner.

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3 METHODS

The main research methods were literature review, content analysis, and comparative analysis. Within the framework of this study, we relied on the ideas of Galanov, Galanova, Chilyukhina, Perepelitsa, Asyaeva, Markov (Galanov et al., 2024, Galanov & Galanova, 2022, Galanov & Galanova, 2023), Frumina (Frumina & Galanov, 2023), and Krivoruchko and Medvedeva (Krivoruchko & Medvedeva, 2023). To get an idea of modern ideas that do not need proof, an academic textbook was also used to complement the phenomenon under consideration (Khominich & Frumina, 2024).

4 RESULTS AND DISCUSSION

A robot acts like a human, but a human should not live and work like a robot. A robot functions strictly (“blindly”) according to its algorithm, while a human rarely acts strictly according to rules for various reasons. Usually, this is possible only when they perform dangerous and important actions. In normal life, i.e., at home or work, a person usually does not have a set of rules or habits that would regulate all aspects of their behavior. Thus, they need reason. However, reason cannot cover all life situations, so this gap is filled by emotions, allowing one to act without reason. A robot also has options for action, but the choice is made based on quantitative criteria embedded in the trading strategy, while a person always has qualitative criteria.

A trading robot acts as a stock trading tool which is characterized by two main relative qualities that distinguish it from a person: it is emotionless and perfect. A person is both emotional and imperfect in all their manifestations.

Regarding the former, no one can and will be able to prove that the absence of emotions, including intuition and other qualities of the human psyche, in stock trading is bad or undesired. Emotions are an obligatory component of human presence in the market.

The issue of accounting for emotions is also relevant in investing. While investment theory often assumes that investors are rational (reasonable) subjects, efforts are still made to account for their psychology as reflected in the development of behavioral finance theory. However, the application of this theory remains problematic.

Although most publications highlight the absence of subjectivity (emotionality) in trading decisions as the main advantage of trading robots in the stock market, no one

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seems to consider that humans are a unity of emotion and reason. This means that removing emotions “halves” the humanity of forming the market price of stocks. More generally, the problem boils down to determining the extent to which the trader can be removed from forming a stock price before it can be claimed that the market price is still a human creation rather than something outside of human influence. The latter would equate to submitting humans to price as a natural law or a creation of higher intelligence. If the trader is excluded from the economic process of forming a stock price, the price inevitably becomes an absolute fetish standing above the human. Not only is humanity dependent on external nature, but now it risks becoming dependent on the impersonal nature of stock trading, where the “hammer” is the “inhuman” stock price.

Regarding the perfection of trading robots, the trend toward ever developing these robots is close to the human desire for self-improvement. Typically, each rational person wishes to be better, smarter, more beautiful, etc. By improving a robot, a person indirectly improves themselves as the robot serves as a tool to enhance the efficiency of their work or other human actions. Traders expect that a trading robot will outperform them in achieving their market goals. However, the process of perfecting a trading robot should not become a process of subordinating the trader to the robot. The improvement of human activity should not be about subordinating to the perfection associated with mathematical formulas. Artworks depicting people or nature created by AI represent things that cannot exist because in life every object is imperfect and improper from various perspectives or qualities. In contrast, AI achieves perfection through the mathematical perfection of images. AI cannot be based on imperfections, even when the starting point for mathematics is chaos or disorder. In such cases, chaos is always ordered chaos defined by corresponding (non-linear) mathematical formulas (or their combinations), not natural chaos or a collection of unknown random events. A specific object is always imperfect, and only its abstract (non-existent) image can be perfect.

Although in economic theory a stock is called fictitious capital, stock trading should not turn into fictitious trading, i.e., something completely separated from the trader (person), their emotions, and abilities (opportunities). The objectively high degree of mediation of transactions between owners of shares and money by trading robots, including the complete absence of a person as a trader, inevitably turns real stock trading into fictitious trading. Nevertheless, the fictitiousness of stock trading due to its digitalization should not go beyond the fictitiousness of the stock itself.

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The development of trading in the direction of using robots shows that there is a certain evolution in forming the market price of a stock and not just a change in trading methods.

We can distinguish the following stages of this evolution:

a) *The rational-emotional stage*. At this stage, the share price is the result of the actions of traders who are guided by the unity of emotional and rational approaches. However, emotionality and rationality are present on the stock market in their specific forms, with the main ones being fear and greed. Indeed, one could also mention such a manifestation as falsehood, which is inextricably linked with fraud. However, we will analyze the economic process in its legal forms.

As evidence, we can recall the famous statement of one of the leading and most authoritative investors of the modern market, W. Buffett, that “financial markets are driven by two powerful emotions – greed and fear”. Both are manifestations of different emotions. But traders use their minds and not just emotions.

If we delve deeper into the understanding of fear and greed, we can see that both can be considered as impulsive phenomena (feelings, emotions) and as conscious phenomena that influence decision-making.

Fear and greed as impulsive feelings and actions related to them do not have any external personal evaluation, except for varying degrees of internal fear or all-consuming desire to have something. Fear as an emotion is a pure feeling of danger in relation to the market situation. Fear in its extreme form is the horror that seizes the trader and paralyzes their actions when they are especially necessary or makes them act contrary to all logic.

Greed as an impulsive feeling is akin to the absence of fear. If there is no fear, then everything is possible. In our case, greed is the desire to maximize one’s monetary income, which is almost impossible to refuse.

Fear and greed as conscious phenomena are reflected in high estimates of risk and profitability, which have a qualitative nature. For example, they are assessed using the concepts: high, very high, excessive, extreme, etc.

Fear as a conscious feeling is a different degree of anxiety over a change in the stock price, and this awareness is manifested in the fact that the trader sets market risk thresholds. Therefore, depending on this threshold or risk level, traders can be distinguished by how much they are afraid of losing their capital. Those afraid of everything trade low-risk stocks (assets). This does not mean that those not afraid of

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high risk do not experience fear or cannot be overcome by fear in a crisis (unexpected) situation.

Greed as a conscious feeling means that a trader can disregard any risks in the pursuit of high returns on their trading. The desired profitability becomes an obsessive goal for the trader who strives to achieve it by any means and methods. Greed is the underlying cause of economic violations in the stock market, while the desire for limited risk forms the foundation for establishing commonly accepted rules for market operations.

Thus, when a trader sets levels of risk and return in their trading strategies, they are guided by their emotions and reason. If these levels are given quantitative assessments, the trading strategy relies more heavily on the trader's rationality. The less formally the risk and return of the trader's activities are defined, the more emotional their trading (strategy) becomes. Fear might cause a trader to close their market position early, while greed might prevent them from closing a profitable position promptly.

b) *The rational stage*. At this stage, the price of a stock is the result of automated trading, i.e., the outcome of algorithmic programs with predefined risk and return parameters set by the trader-owner of the trading robot.

The subjective aspect of the stock price formation is reduced to the quantitative parameters of profitability and risk that the trader sets which remain unchanged unless the robot is stopped, and the program is modified. The trader's emotions manifest solely in the levels of risk and return they personally establish, and these must be in quantitative form. The emotional aspect of the trader's strategy is retained in the levels of risk and return they set, but it no longer manifests as impulsive feelings or spontaneous market actions stemming from those feelings.

c) *The AI stage*. At this stage, the price of a stock is still the result of automated trading, but the profitability and risk parameters of the trading program are set by the intelligent program itself. This program independently develops the trading strategy along with its characteristics. The levels of risk and return for a specific trading program are not established by the trader as the robot's owner but by the intelligent program created by the trader, which becomes the sole creator of the trading strategy.

When a trader is the one executing trades, they always have a personal trading strategy, whether it is in their mind or documented somewhere, even if it does not have a fully developed mathematical form. When a trader independently creates a trading

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strategy for a trading robot, they still retain their status as a nearly direct market participant, but they have already lost their emotional involvement, becoming a more detached, unemotional participant. *At the rational stage*, the trader's emotionality becomes divided: part of it manifests in the creation of the strategy, while another part can be expressed if the trader is directly involved in the trades. However, the emotionality of the trader as the creator of the strategy differs from the emotionality of a direct trader since only in the latter case their emotionality directly influences the price formation of the stock. *At the AI stage*, the trader's emotionality transitions to the level of interaction with artificial intelligence. As a result, the emotionality of the trading strategy and the price formation of the stock becomes minimal or non-existent. Only a human is emotional, not AI, when constructing a trading strategy. AI creates not only an emotionless trading strategy but also one that the trader either cannot design themselves or cannot implement in practice. *At the AI stage*, the price of a stock is formed independently of the trader as the robot's owner.

If a trader's involvement in the trading strategy and the price formation of a financial asset is relatively uncontroversial in the first two stages, the third stage presents a significant challenge. The issue arises as to how much market-based price formation is preserved when transitioning to the third stage, where the trader's involvement in setting the price of a financial asset is significantly weakened due to the mediation of their trading actions and trading strategy. This is like questioning to what extent a product created by a robot can still be considered the result of human labor. Where is the threshold of human involvement in market (trading) activities that allows one to assert that the person has ceased to be a participant in the market?

The issue can also be framed differently: at what point does the degree of a trader's (human's) non-participation in the trading process become a barrier to the formation of a truly market-driven price for a financial asset? The creators of the Hamster Combat app designed a game where users tap their gadget screens (or press keys) to earn virtual coins. Can we consider the prices of these coins to be market-driven simply because of the number of taps on the gadget? What distinguishes this process from what occurs in the actual market? The difference lies in the intentionality of the trading process, i.e., its human nature. Humans have limited knowledge of what the price of a financial asset should be, which is why its current levels are random and can fluctuate from zero to potentially any value (the price of a financial asset is fundamentally different from the price of a good, which is based on production costs). In this context,

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"humanity" broadly refers to the unity of rationality and emotionality in a trader's behavior.

The price of a financial asset is random not due to the random nature of a trader's actions (as in the case of Hamster Combat), but because of the opposing economic interests of the parties involved in the transaction. However, this indicates that, despite its randomness, the price of a financial asset has an economic basis rooted in its intrinsic connection to various financial indicators. Randomness has no limits or boundaries. The existence of these boundaries reflects that, despite randomness, there are still objective economic foundations underlying the price. Market participants form the price of a financial asset in a seemingly random manner, but they do so with reference to the capital that the asset represents.

If we proceed from the axiom that the market is a relationship between people, then the market using fintech solutions can preserve its status, if it retains a significant share of orders given by people and not robots. It seems due to the fact that the world's largest stock exchange in the United States (the New York Stock Exchange) offers a dealer market (public trading) along with electronic trading. Second, the market remains a market if the robot acting as an intermediary puts the participants in the transaction at a distance that does not exceed the possibility that they continue to feel like participants in the transaction and not just its observers or income beneficiaries.

However, forming the market price of a financial asset on the financial market is accompanied by the redistribution of money and financial capital among its participants. Therefore, a market participant may still feel involved, even if they are not directly engaged in transactions as they see the changes in their personal (private) capital. The movement of capital across accounts is a result of price fluctuations. If the price of a financial asset becomes completely independent of account holders, they become entirely disengaged from the changes in their capital. According to the law of large numbers, large capitals tend to absorb smaller ones. When this process is formalized, it demotivates small private capitals to participate in the financial market, which could have a negative impact on the future of the market.

5 CONCLUSIONS

The introduction of fintech solutions into the financial market is undesirable from the standpoint of preserving humanity in forming the market price of a financial asset.

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However, this can create additional opportunities for the growth of large private capital, and this process has no limits due to the very nature of the market economy. Restrictions on the use of fintech solutions reflect the interest of the mass consumer, while their absence shows the interest of a few owners of large capital. Only the position of financial market participants determines whether human participation in the formation of the price of a financial asset will be preserved or will almost completely disappear.

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