INDIVIDUALISED FIN-TECH INVESTMENT SERVICES

*Angel MARCHEV (Orcid: 0000-0002-5090-3123)

*Vasil MARCHEV (Orcid: 0000-0001-9412-2831)

*University of National and World Economy, Bulgaria

ABSTRACT

This research paper explores the concept of customized fintech investment services, focusing on individualization, diversification, and the construction algorithm of such services. The study highlights the importance of diversification in investment portfolios, emphasizing its role in minimizing risk levels and increasing profitability by including a variety of investment instruments. The paper presents a conceptual description of the construction algorithm for individualized fintech investment services, discussing the methodology and architecture of the proposed system. The model comprises several subsystems, including an input data subsystem for collecting and filtering data, an assessment system for establishing numerical indicators and segmentation, and a recommender system for determining quality indicators and generating personalized investment portfolios. The recommender system considers individual risk preferences and available investment opportunities to provide informed decision-making for users. The paper concludes by highlighting the significance of feedback, analysis, summaries, and reports in enhancing the effectiveness of customized fintech investment services. Overall, this research contributes to the understanding of personalized fintech solutions and their potential to meet the unique needs of investors through individualization, diversification, and a systematic construction algorithm.

Keywords: Customized fintech investment services, Individualization, Diversification, Fintech industry

INTRODUCTION

With the dynamic development of new technologies in the last decades has seen a fundamental difference in investment product markets. A completely new field of investment opportunities is emerging, which is conditioned by the changed customer attitude. The emergence of a completely new type of customer is observed, who are looking for complex products and avoid traditional investment opportunities.

In recent years, the investment markets have seen a return of small investors (individuals), and the factors for this are rooted in several main aspects. The first aspect is related to the change in the investment markets. There are positive trends of growth in the shares of technological companies, related to the increasingly dynamic and sustainable development of high technologies. The second aspect is related to the changes that occurred in traditional saving approaches. Over the past decade, a negative trend has been observed in the interest rates on deposits in commercial banks. Currently, in a number of European countries, the interest rates for both individuals and legal entities are a negative value or close to zero. In Bulgaria to date, with the main players in the banking market, interest rates on deposits are very close to or equal to zero.

An increase in the personal income of individuals is observed, which in turn creates prerequisites for an increase in household savings. There is a direct correlation between low-interest rates and higher personal income, which is why there is a need for a new product based on the personal preferences of individuals. A third aspect that can be noted is the growth of the volume of knowledge in the field of investments. As technology advances, it becomes easier to access the world's sources of knowledge. Increasing the general culture of society in the field of investment theory and easy access to global stock markets provide individuals with new investment opportunities.

THE FINTECH INDUSTRY

Definition of the Concept

In the literature depending on FinTech, there are certain contradictions in the definition of the main concepts. At the moment, no single definition can be established that satisfies all areas of the fintech industry. According to the Oxford Dictionary, fintech is "computer programs and other technologies used to support or enable banking and financial services: fintech is one of the fastest growing areas for venture capitalists".

According to Schüffel (2016), the concept of fintech can be interpreted as: "a new financial industry that applies technology to improve financial activities". The concept is also found as: "an interdisciplinary subject that combines finance, technology management, and innovation management", and as an addition, it can be indicated: as "any innovative idea that improves the processes of financial services, offering technological solutions related to various business situations, while ideas can also lead to new business models or even new businesses" (Leong, 2018).

In their paper on the evolution of the fintech industry, Arner et al (2015) find that "the origin of the term can be found back to the early 1990s, referring to the 'Financial Services Technology Consortium,' a project initiated by Citigroup to facilitate technological cooperation efforts".

Other authors claim that the term fintech can be observed even further back in time. According to Bettinger (1972), fintech is an acronym that stands for financial technology, combining banking experience with modern techniques for Science and Computer Management.

The fintech industry is "an interdisciplinary subject that combines finance, technology management, and innovation management... The term fintech refers to any innovative ideas that improve financial service processes by offering technological solutions depending on different business situations, such as at the same time, ideas can lead to new business models or even new business" (Leong, 2018).

Other interpretations define fintech companies as start-ups for technological solutions in the financial industry.

For the purposes of this paper, the following working definition is used: fintech is a series of sequential processes and algorithms based on the new technologies (internet, fast communications, increased online security) that have become a reality in recent decades. This concept covers a number of financial operations such as: lending to individuals and legal entities, money transfers, management of financial assets, savings, investments, insurance, etc.

The Essence of the Fintech Industry

The FinTech industry is an approach to the provision of financial services based entirely on the new technologies that have developed in recent decades. This technology is provided by companies that, following the dynamic trends of technology development, aim to become an alternative to traditional financial structures by providing faster and more flexible services tailored to the needs of customers. The financial crisis of 2008 and the decline in customer confidence in traditional financial agents in the economy can be considered as a push in the development of the fintech industry.

The fintech industry aims to improve the customer service process by providing financial services that are tailored to the developing world and respond to changing demand. New approaches are established in the management of customer needs, such as monitoring enhanced options for total customer satisfaction.

The fintech companies focus on a certain set of financial services also offered by commercial banks. The essential difference lies in the way of providing them. The main competitive advantage of fintech companies over commercial banks is the process of satisfying customer wishes. The channels through which the product can be delivered in the cheapest possible, convenient, and fast way for the customer are sought.

The directions in which fintech companies provide more competitive products than commercial banks are money transfers, electronic wallets, lending to small and medium enterprises, asset management, and others. The fintech revolution had a boost in its development at the end of the 20th century. The emergence of the Internet appears as the main accelerator in the integration of high-tech solutions in the world of finance. Through its easy accessibility and widespread application, limitless possibilities are established, which are provided by the internet.

The revolutionary development of financial services since the advent of the Internet and online banking has led to positive changes for the customers of financial institutions. The positive effects that are observed are lower operating costs, shorter time to provide the services, easier communication, more convenient interaction with customers, quick and easy access to information, etc. The trend in recent years directed the changes to shift toward improving technologies for transmitting, analyzing, and storing data, improving security, tracking the history of customer behavior, and providing solutions in line with it, or other words creating recommender systems for services and products.

The development of fintech services regarding investment is being boosted by the development of automated investment models. These are models based on algorithms for machine self-learning, analysis of big data sets, artificial intelligence, etc., through which provide automated financial advice or investment management approaches. Through such types of systematized algorithms, clients are provided with a set of personalized investment options. Depending on the needs of the clients, the models vary different options for data updates, offering real-time updates through online-based applications, this is done in an easy, affordable, and efficient way for the customer.

Funding as part of the fintech industry has taken the form of many diverse and innovative ways of lending that are largely becoming an alternative to the traditional ways of financing companies by financial agents in the economy. Crowdfunding is one of the alternative approaches for fundraising by fintech companies. This method represents procurement "...in small contributions from a large number of persons..." (Calic, 2018).

According to Calic (2018), the roots of the method can be found far back in the history of financial relationships between people. In the 21st century, crowdfunding gained popularity through online social media and commercial platforms that manage to develop the practice, improving it through the possibilities provided by the Internet and high technologies, making it both more accessible and more widespread.

Using similar funding models based on multiple modest-sized lenders enables some small companies that do not have a credit history or do not have the volume they need to collateral to benefit from lending from a traditional financial institution, to attract the capital they need to develop their business idea. With the increasingly violent development of new technologies in finance, there is a need to improve the algorithms for the exchange of information, optimization of transaction costs, provision of new financing alternatives, or assistance in the process of searching for an appropriate solution in case of need for financing.

The main advantage of fintech companies - their flexibility and dynamism - collides with a regulated and largely conservative system such as the financial one, and this raises several questions for legislators regarding the future development of the legal framework and the unification of the final result of the applied norms.

Individualization

Individual characteristics (personal characteristics) - According to Costa and McCrae (1989), "personal traits are continuous and consistent characteristic reactions of a individuals when interacting with different circumstances". Individual personality characteristics are the main drivers of individual behaviour. Based on personality traits, the inherent tendencies of individuals in different situations can be visualized. Personality traits are classified as "general qualities" and "personal qualities" (Cheng-Ling at al, 2012). Generic qualities are characteristic of most people but are possessed by individuals in varying amounts and can therefore be used to compare different individuals. On the other hand, personal attributes are unique and can be used as a personal identifier (Allport, 1961)

The use of an individualized approach in the generation and management of investment portfolios represents taking into account a set of previously identified characteristics that are defined as significant in the selection of investment opportunities.

Individualized approach - for the purposes of the current paper is understood as a set of sequential actions to establish the personal preferences of each user of the model. For this aim, basic areas of personal qualities, demographic characteristics, and personal and financial characteristics influencing the choice of investment portfolios have been defined. The individualized approach takes into account personal preferences, qualities, psychological characteristics, and individual risk preferences.

Following such an approach implies a complete knowledge of the client's wishes and necessities. The creation of an individualized way of working is based on an interdisciplinary methodology covering the main scientific areas relevant to the investment choices of consumers. By means of the considered work methodology, an investment profile of each investor is realized, thus ensuring a more complete and adequate satisfaction of the client's needs.

Change of Clients - New Type of Automated Products

The above-described changes, both in the markets of investment products, and the changes related to the development of a new type of financial service provider are caused both by the development of new technologies and by the transformation of the behaviour of investors. The main change in the behaviour of investors consists in increasing the frequency of searching for diverse investment opportunities to be an alternative to the standard savings products available in the environment. The rapid development of new technologies and easier access to information provides numerous opportunities for investing financial resources. These options were unthinkable before the advent of modern communication technologies. Quick access to global stock markets provides many new and different ways to invest.

At the same time, occurs an increasingly essential need for individualized wishes and necessities of participants in financial services markets. The personal qualities and characteristics of investors, their desires, and their capabilities imply a fundamental change in customer behaviour - from standardization to personalization.

The described changes in investment markets, the development of new technologies, and easier access to markets, combined with the increase in household incomes in the last decade create a need to formulate a product that covers the personal needs of individuals, matching them with those available on the market investment instruments. There is a need for a product that provides customized solutions depending on the individual needs of customers.

The need for such a product implies the preparation of an analysis of the wishes and needs of the customers. The scorecard method can be used as an approach for this. In the literature, scorecards can be divided into several different subtypes, such as balanced scorecards, credit scorecards, etc. "The Balanced Scorecard is a strategic performance management metric used to identify and improve various internal business functions and resulting external outcomes." (Tarver, 2020)

According to Hand and Jacka (1998), "The process (from the perspective of the financial institutions) of modeling creditworthiness is called credit scoring". According to Anderson (2007), to define credit scoring, the term should be decomposed into two distinct parts: credit and scoring. The word "credit" means "buy" now, and pay later." It is derived from the Latin word 'credo', meaning 'to believe' or 'to believe in'. The second component - 'scoring' refers to 'the use of a numerical tool to rank individual cases'. Additionally, Abdou (2011) wrote on the subject. Summarizing the considered statements, the following working definition is adopted in the following development - the scorecard

is a method based on numerical indicators, by means of which the research participants are arranged according to predetermined criteria.

In the present study, the scorecard represents a tool through which several essential moments are realized when starting the process of building an individualized portfolio. It is used both as a tool for gathering initial information about the customer, as well as a means by which users are ranked and assigned to appropriate clusters.

The provided data is based on pre-prepared questionnaires with the aim to establish the inherent characteristics of each participant. This type of questionnaire is based on the need for investment profiling of each of the participants. By means of this phase the individual risk preferences of individuals, their limitations, and reflexes towards their surroundings are established and taken into account.

A scorecard is a main tool for establishing the levels of the major measures of the initially set criteria and characteristics of individuals. The scorecard aims to establish individual preferences, investment horizon, financial collateral, desired yield, etc. With the considered tool, a personalized investment psychological profile is created. The scorecards in the current model also have the function of a main indicator when separating customers into different groups. The creation of an individualized solution for each client is not economically justified, it implies, by means of statistical algorithms and dependencies, to single out larger homogenized sets of individuals. Based on the final indicators for each of the considered variables, groups with similar values are identified, thus aiming to create a subset in which its constituent members share common values, experiences, needs, etc.

Based on the methodology described above, the concept of the balanced scorecard acquires the framework of a tool for strategic management and control, both of organizational processes and in a personal aspect, and is not identified only with its initially isolated functions for measuring the productivity and state of company-wide processes.

INVESTMENT SERVICES FOR INDIVIDUALS

Types of Investment Products

According to the CFA Institute (Bodie et al, 2014), the management process of investment covers three main elements which have dynamic feedback: planning, implementation, and feedback. The three subparts of the considered process cover both storage, analysis, and the implementation of both customer and capital market data. This leads to a policy for drawing up guidelines, which is significant in its volume (the strategic asset allocation). The implementation specifies the details of the optimal asset allocation and security selection. The last phase of the process is the feedback loop - this covers the element of adaptation to changes in expectations and goals, as well as changes in portfolio composition, which result from changes in market prices.

According to Boddy et al (2014), the main return factors affecting individual investor requirements and risk appetite are the life cycle stage and individual preferences. Including individual preferences regarding investment instruments as well as the duration of the investment and the expected profitability.

Nowadays, there are several types of investment companies that provide their clients with interesting opportunities for investing their free funds. Such can be:

Mutual funds. This is an instrument in which the funds raised by investors are invested in ways specified in the fund operator prospectuses and sold shares to investors who entitle them to a proportionate share of the income generated by the fund. The return requirement and risk preferences are variables. Depending on their preferences, investors can invest their finances in a wide range of mutual funds.

Pension funds. There are two main types of pension funds: defined contribution and defined income.

Insurance companies. In the case under consideration, there is an opportunity to invest free resources in various insurance and insurance-saving products.

Banks. Investment in banking products. Banks provide a wide range of different investment products. Covering both risk-free investments, such as deposits (In Bulgaria - guaranteed up to BGN 196 thousand (EUR 100 thousand) by BDIF), as well as investment products with a significant risk rate and high potential profitability.

Despite the availability of the above-mentioned opportunities, there is a lack of product on the market that is entirely aimed at the personal preferences of individuals and that can be considered as an alternative to the currently existing investment opportunities.

Limitation on Individual Investments

In the investment process, several factors are observed that can influence the decisions to invest a financial resource in a certain investment instrument. These limitations provide an opportunity to more fully define customer needs.

Circumstances considered may include liquidity requirements, cash flow, or other legal restrictions. These circumstances impose barriers to the choice of investors. The combination of the investment goals and the considered restrictions creates a set of rules and norms that are fundamental in setting the investment policy. The restrictions in the investment policy can be related to both the potential investor and the investment intermediaries. There are several barriers to investment companies generated by legal restrictions on the types of assets they can hold in their portfolios.

A major factor when considering the limitations is liquidity. This is the ability to convert an instrument, both into other investment instruments and into cash or cash equivalents. The process is an interpretation of the time dimension (how long would take to sell) and the price dimension (any discount from fair market price) of an investment asset. Treasury bills and shares, where the bid-ask spread is less than 1%, are among the most liquid assets, while real estate is among the most illiquid, according to Bodie et al (2014). The essence of the liquidity restriction consists of the individual assessment of the potential need for funds in the foreseeable future. Therefore, the generated estimate establishes the minimum level of liquid assets that are a constituent part of the investment portfolio.

Another significant limitation in the investment process is the investment horizon. In the literature, the investment horizon is understood as "... the planned date for the liquidation of the investment or a significant part of it..." (Bodie et al, 2014). This factor is essential in cases where the portfolio contains investment instruments with different maturities. Depending on the latest closing dates of the investment instruments, it is necessary to review the entire portfolio, due to the possible negative effects related to the diversification of investments, because of the maturities of some of the investment instruments.

Restrictions may appear in the investment process as a result of various legal regulations. Depending on the type of investor, different norms are established, and those for individual investors are relaxed to the greatest extent.

Other possible restrictions depend on the individual characteristics of the investor, the desires, capabilities, and personal qualities. According to Bodie et al (2014) the human capital, the totality of all personal characteristics, potential desires, and capabilities of the investor plays a significant role in building his unique risk profile. This has a significant role in determining a suitable investment portfolio. The current stage of the investor's life cycle is established as an essential factor.

Assets Allocation and Selection of Investment Instruments. Types of Risks

The construction of an investment strategy and the generation of an investment portfolio is a consequence of establishing the main goals that drive investors in the process of investing financial assets. Depending on personal needs and characteristics, a set of investment policies is created related to the distribution of assets, the diversification of the portfolio, and the specificity and essence of the investment instruments that make up the general portfolio. The correct setting of the weights of the different categories of assets is critical for the realization of the set investment goals.

According to Bodie at al (2014), the process is also associated with the distribution of activities and goes through several main phases. The first phase is associated with the selection of the type of assets to be included in the investment portfolio. The main types of assets can be distinguished into the following groups: instruments of the money market, fixed-income securities, real estate, noble metals, etc.

The second phase involves a process of analysis of the possibilities of the market. For this purpose, a review and analysis of the factors necessary for return expectations are established.

The third phase involves calculating the optimal portfolios and establishing a set of possible investments for which it is relevant to gain maximum return in preset levels of risk.

The fourth phase - is the need to establish the optimal mix of assets. This step consists in choosing an effective portfolio that best meets the risk objectives successfully achieved and returns while meeting the constraints dictated by the specific individual characteristics, wants, and needs.

Depending on the individual risk preferences of the investors, both the types of instruments to be used in the construction of the portfolios and the desired return on the investment are established. To correctly establish the potential risk levels of investors, it is necessary to establish the main risks that accompany the process of investing financial assets. According to Bodie et al. (2014), risk management when building investment portfolios is about adding more types of risk. Avoiding or reducing one type of risk leads to increased levels of other types of risk. According to the authors, there is no such thing as completely "risk-free investments".

The main risks related to the investment process:

Market risk. Market risk is a fundamental one that accompanies the investment process. This represents the chance of reducing investment to devalue the invested funds below the threshold of the selected amount.

Purchasing power risk or inflation risk. This is a risk that investors bear from the small returns of low-risk assets. This risk covers the possibility of a smaller increase in capital investment compared to inflation growth.

Interest rate risk. Interest rate risk is inherent in cases where there are falling interest rates and potential future earnings reduce your value, and reinvestment of funds is required. Diminishing returns, through longer-term securities with higher yields, create an opportunity for inflation to accelerate if interest rates change again.

Time risk. Time risk is correlated with the personal characteristics of the investor. Depending on the investment horizon, the frequency of revision of the portfolio, and the type of investment, there are risks of not achieving the chosen goals. In relation to the risk under consideration, it is necessary to make an informed choice about the need for financial resources in a certain period of time, since any investment is associated with a temporary abandonment of the given future resource, with a view to potential future benefits. Premature termination of the given investment is associated with the risk of not meeting the predetermined return values.

Liquidity risk. This is a risk directly related to the occurrence of a change in the investment markets, including the restriction or closure of organized stock markets, which could lead to potential financial losses for investors.

Political risk. This is the perspective related to government decisions in each area and the impact on the value of investments. As the events of the years are considered and interpreted through the prism of the financial conjuncture, this potential risk affects all forms of investment, regardless of whether it is low or high risk.

Social risk. Risks related to negative events of epochal magnitude fall into this column. These are risks related to natural disasters, pandemics, wars, etc. Some businesses are more susceptible to this type of risk, but in general, it is relevant to all types of investments.

Depending on the individual investment needs of the investors and their personal characteristics, the constructed portfolios are optimized to determine the risks that are most common in the proposed composition of their investment instruments.

Portfolio Management of Individual Investments

Portfolio management of individual investors aims to interpret the individual needs and desires of individuals. Depending on the personal goals of each investor, it is built appropriate investment strategy.

According to Bodie et al. (2014), an essential element in determining the objectives of the individual investor is the relevant stage of the life cycle in which it is. In the initial stages of the investors' life cycle, a need to preserve liquidity, with investments assuming a higher degree of risk, but also a greater return, remains in the background. Depending on the current income of investors and satisfaction of primary needs, investment goals, and attitudes are also changing.

Depending on the personal investment goals and, in particular, on the investment strategies, different behavior of investors is established when implementing the initially established parameters.

Investment goals can vary from accumulating a financial asset for current needs, through financial means for your own business, to investments with the aim of improving conditions during retirement and exiting active working age. The main purpose of lifetime savings is to enable the maintenance of a normal standard of living after retirement.

In the stage under consideration of the investor's life cycle, a trend is observed related to the attitudes of individuals from higher risk investments to those avoiding its high levels. This is largely due to the uncertainty associated with the potential to deal with the possible negative consequences that may occur with an inappropriate investment.

The optimization of individual investor portfolios is related to the correct and adequate establishment of the goals and limitations of the respective investor. In this way, it is carried out more precisely and accurately investment strategy, when building a portfolio and establishing its characteristics. Observing the current trends related to the investment instruments integrated into the portfolio allows for periodic changes in the composition or number of instruments in the investment.

DIVERSIFICATION

There are various information sources on the concept of diversification. The main semantic guidelines are described. According to Jones (1994), the process of investments is made in a variety of assets, so the risk exposure of each investment instrument will be limited. Other authors described the investment process as the process of adding a variety of investment instruments into a portfolio to reduce the unique risk and hence overall portfolio risk (Alexander et al, 1993). According to Block (1992), there is an impact of a given investment on the company's overall risk-to-return composition. The investors must consider not only the individual investment characteristics but also how this investment interacts with the portfolio. For this process, Luenberger (1998) wrote, that the variance of portfolio returns can be reduced by including additional assets in the portfolio.

Summarizing the above-described formulations, the following working definition is used in the present work: diversification is minimizing risk levels and increasing profitability through the inclusion of various investment instruments in the portfolio.

CONCEPTUAL DESCRIPTION OF THE CONSTRUCTION ALGORITHM OF AN INDIVIDUALIZED FIN-TECH INVESTMENT SERVICES

This section observes both the methodology for preparing the considered individualized fintech service and the architecture of the proposed system with the existing information flows - incoming, outgoing, and between the constituent subsystems. An overview of the main component blocks of the model and of the secondary subsystems is carried out.

The detailed breakdown of the fintech product developing process establishes a series of successive phases arranged in a management cycle. Each stage is represented by a subsystem in the architecture of the general model for creating individualized solutions (Marchev, 2018).

Figure 1 visualizes the general scheme of the model. The system is composed of several separate subsystems. Subsystem for incoming data for both individual clients and incoming information on investment opportunities available and accessible to individuals. The other two main component parts of the model are the block "Assessment system" and block "Recommender system".

Each of the model's two main blocks can be observed and functioned as a separate model, along with their adjacent input blocks.

The input data subsystem provides data arrays related to information about individuals. This set of subsystems is responsible for the process of collecting data and bringing it into a form suitable to the other subsystems. The data input subsystem consists of two main modules: a module for collecting primary information about potential customers and another module for filtering.

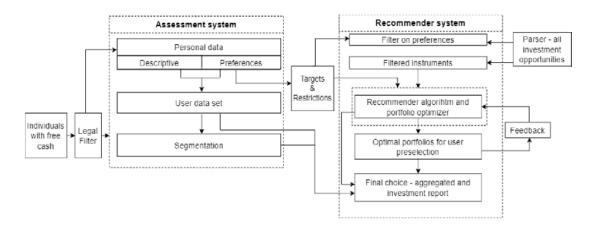


Figure 1: General scheme of the fintech model

In the main block "Assessment system" (Fig. 2), the numerical indicators of the major characteristics of the existing data are established. The segmentation is completed based on the values of the considered information and tend an assessment of each user is built, for this purpose, a detailed scorecard is created.

A suitable way to segment the available data against the real numerical indicators of the established characteristics is the process of clustering.

This subsystem implies two-way communication with the computer model. The first direction of the information flow is through the input data available from the system and its coding in the specified module, and the second flow is aimed at a subsequent review of the generated clusters, through the segmentation.

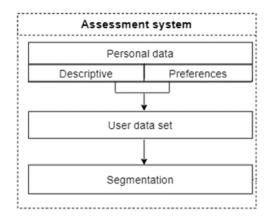


Figure 2: Assessment system

In the "Recommender system" (Fig. 3) the quality indicators of the main characteristics of the incoming data are determined. The initially allocated preferences set in the "Assessment system" are filtered. In addition, the information received regarding individual risk preferences and the available investment opportunities for individuals ensures the necessary data of the "Recommendation System" block.

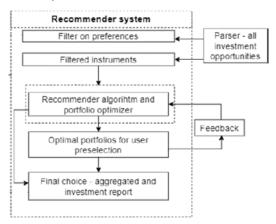


Figure 3: Recommender system

The module generates a set of investment portfolios that are aligned with the individual characteristics and preferences of the users. The block provides an opportunity for making an informed decision by the user. An additional system for feedback, analysis, summaries, and reports has been created.

CONCLUSION

This research paper has examined the concept of customized fintech investment services, delving into the prerequisites, development, individualization, diversification, and construction algorithm of such services. The findings shed light on the evolving landscape of investment markets, driven by changing customer attitudes and advancements in technology.

The study has highlighted the factors contributing to the resurgence of small investors and their growing demand for personalized investment products. The positive growth trends in technological companies, coupled with low-interest rates on traditional savings products, have fueled the need for new investment opportunities. Additionally, the accessibility of investment knowledge and global stock markets has expanded the range of possibilities for individuals seeking to invest their financial resources.

The emergence of the fintech industry has been instrumental in meeting the changing demands of investors. Fintech companies leverage technology to provide faster, more flexible, and tailored financial services compared to traditional financial structures. The development of automated investment models, driven by machine learning algorithms and big data analysis, has facilitated the provision of individualized investment advice and management approaches.

Furthermore, the paper has emphasized the importance of diversification in investment portfolios. By including a variety of investment instruments, investors can limit risk exposure and enhance overall portfolio performance. The construction algorithm for individualized fintech investment services has been explored, outlining the methodology and architecture of the proposed system. The use of scorecards, clustering techniques, and recommender systems allows for the customization of investment solutions based on individual preferences, risk profiles, and available investment opportunities.

In conclusion, the research highlights the significant potential of customized fintech investment services in meeting the unique needs of investors. By leveraging technological advancements and adopting an individualized approach, fintech companies can provide tailored investment solutions that align with customer preferences, enhance diversification, and optimize risk-return trade-offs. The findings of this study contribute to the growing volume of knowledge on personalized fintech solutions and provide valuable insights for investors and financial institutions. As the fintech industry continues to evolve, it is crucial to embrace innovative approaches that empower individuals and enhance their financial well-being.

ACKNOWLEDGMENTS

The authors would like to extend their gratitude to the University on National and World Economy and the project NID NI 23/2023/B for funding this research, and for the prime administrative assistance in general.

REFERENCES

Abdou, HAH and Pointon, J. (2011). Credit scoring, statistical techniques and evaluation criteria: A review of the literature - Abdou, HAH and Pointon

Alexander, G. J., W. F. Sharpe, J. V. Bailey. (1993). "Fundamentals of Investments (Second edition)", Prentice Hall, Englewood Cliffs, New Jersey, p. 836

Allport GW. (1961). "Pattern of growth in personality", NY: Holt, Rinehart and Winston;

Anderson, R. (2007). The Credit Scoring Toolkit: Theory and Practice for Retail Credit Risk Management and Decision Automation. New York: Oxford University Press

Arner, D. W., Barberis, J. N., Buckley, R. P. (2015). "The Evolution of Fintech: A New PostCrisis Paradigm?", Hong Kong

Bettinger, A. (1972). "FINTECH: A Series of 40 Time Shared Models Used at Manufacturers Hanover Trust Company. Interfaces", 2(4), p. 62-63.

Block, S. B., G. A. Hirt (1992) Foundations of Financial Management, IRWIN, Boston, p. 687

Bodie, Z, Kane, A, Marcus, A. (2014). Investments Tenth Edition

Calic, G. (2018), "Crowdfunding", The SAGE Encyclopedia of the Internet

Cheng-Ling T., Li-Chun Ch., Che-Ming Ch., Jhao-Yu H. (2012). "The impact of individual characteristics, personality traits, perceived risk on young people's intention to participate in overseas working holiday", Procedia - Social and Behavioral Sciences 57, p.388 – 395

Costa Jr PT., McCrae R.,R.,Dembroski T. (1989). "Agreeableness vs. Antagonism: Explication of a potential risk factor for CHD. In A. Siegman & T. M. Dembroski (Eds.), In search of coronary-prone behavior. Beyond Type A Hillsdale. NJ: Lawrence Erlbaum, 1989; 41-63.

Hand, D. J., Jacka, S. D. (1998). "Statistics in Finance", Arnold Applications of Statistics: London

Jones, C. P. (1994) "Investments: Analysis and Management", John Wiley & Sons, New York, p. 150

Leong, K. Sung, A. (2018) "FinTech (Financial Technology): What is It and How to Use Technologies to Create Business Value in Fintech Way?", International Journal of Innovation, Management and Technology. 9 (2), p. 74–78

Luenberger, D. G. (1998). Investment Science, Oxford, University Press, p. 151

Marchev, V. (2018), "Kontseptualno opisanie na algoritam za izgrazhdane na individualiziran investitsionen portfeyl", Vanguard Scientific Instruments In Management, (ISSN 1314-0582), http://vsim-journal.info, vol. 14

Oxford dictionary, Definition of Fintech

https://www.oxfordlearnersdictionaries.com/definition/english/fintech?q=fintech

Schüffel, P. (2016). "Taming the Beast: A Scientific Definition of Fintech", Journal of Innovation Management, p. 32–54

Tarver, E. (2020). "Definition of balanced scorecard" - Investopedia.com