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PROJECT MANAGEMENT OF INVESTMENT PORTFOLIOS OF A COMPANY AND ITS INNOVATION DEVELOPMENT

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Methods. To study the features of the use of project management in foreign investment management, the method of analysing literary sources and summarizing the information obtained was used. To describe the processes of investment portfolio formation in the work, the following methods were used: comparison, generalization, synthesis, and critical analysis to examine scientific works on investment and strategic management, determining the trends of research and practical approaches to managing an investment portfolio; economic and mathematical modeling to determine asset ratios when forming portfolios according to various investment strategies; methods of mathematical statistics to identify interdependencies between prices of financial instruments and their numerical characteristics; observation and systematic analysis to define the reasons for the uncharacteristic behavior of some financial instruments during the study; and methods of induction and deduction to form conclusions in the study process.

Results. The paper presents the results of the US financial markets' study from the perspective of attracting investment resources for the development of the Ukrainian economy. Special attention is paid to the possibilities of using project management methods in the implementation of innovative projects for the development of enterprises.

Novelty. The application of AI in investment planning enables firms to gain a competitive edge through access to advanced technologies and adaptability in business models. These capabilities support strategic responses to dynamic stock market trends. Key tasks for investment managers include selecting long-term asset management models, analysing return deviations, and assessing correlations between assets and investment tools, project management competencies.

Practical value. The article highlights the urgent need for Ukraine to transition toward an innovation-driven industrial model in response to the destruction of its legacy production base during the war. It emphasizes the creation of project offices and the development of investment and innovation strategies as essential tools for attracting and effectively managing foreign investments. The practical value lies in offering a roadmap for postwar economic recovery through international capital engagement, modern technological integration, and strategic portfolio formation tailored to the volatile global financial environment.

Keywords: project management, investment management, management, digitalization, business project, capital

Statement of problem. The acceleration of economic growth has become the by in most countries of the world. The last century and the beginning of a large-scale scientific and technological revolution led to the formation of a knowledge economy. The peculiarity of Ukrainian economy development was rather slow introduction of innovations during the last four decades caused by a shortage of investment resources and structural disproportions of the economy. Preference was given to heavy engineering, mining and agriculture. On the other hand, while more modern industries (i.e. microelectronics; IT; computer technologies; and production of new materials) were at the initial stage of their development.

To manage the attractive investment funds, it is necessary to create project offices that would ensure the selection of priority investment areas, as well as the effective use of attracted funds, taking into account the experience of the European Union. In the conditions of a full-scale war, the issues of external investment support at the expense of foreign donors: both states and charitable organizations, became relevant. However, the start of the full-scale war in 2022 and the large-scale destruction of industrial infrastructure, resulting from the military operations, put an end to the evolutionary transition from the "post-socialist production model" (by this term, the authors mean the significant part of the fixed assets of large enterprises that was created in Ukraine even before the moment of the beginning of market reforms) to the modern one being innovative, inherent in the world of the fourth technological revolution. It is obvious that at the time of Ukraine disengagement from the Russian-Ukrainian war, no matter how distant this prospect may be in terms of time, the lost industrial potential will not be able to be restored in accordance with the technologies that were used before 2022 or are being used now. There will be the need to create completely new industries based on innovative technologies, highly robotic and automated (which is especially relevant taking into account the reduction in the number of the labour force as a result of losses from hostilities as well as the occupation of part of the country territories, and the forced mass migration of the population). To move to the new model of industrial development, Ukrainian economy will need to attract significant investment resources, and the resources cannot be internal. In the necessary volumes, investment resources will be available to Ukrainian firms only on international capital markets. The described situation makes companies craft proper vital investment and innovation strategies. Such strategies are intended to establish communications with investors; determine the tendencies to apply the invested funds, and calculate their payback period. While analyzing various investment strategies, investors always rely on the hypothesis of an efficient market, although the mentioned issue is still the subject of professional disputes and causes many comments regarding the understanding of the market efficiency degree. In particular, the critical comments concern the distribution of assets and the rules followed by most market participants when compiling an investment portfolio. Classical methods of its optimization, based on the level of profitability and risk, cannot work properly since market dynamism increases. Moreover, their pronounced stochastic nature of development and vulnerability to crises, both military and economic, due to interdependence due to financial and technological globalization is obvious. The financial markets have played and continue to play an important role in providing the national economy with resources for the development of technologies; creation of innovative industries; and the attraction of new ideas and the qualified labour resources. The wartime and postwar financial potential of Ukraine is not capable of ensuring the accelerated recovery of the economy and the expanded reproduction of the capital of Ukrainian enterprises.

Analyses of recent papers. There is a disparity in the world between countries, where investment resources are so significant that banking institutions offer zero or even negative interest for depositing capital, and countries where "investment hunger" takes place as a result of low volumes of foreign direct investment inflows, underdevelopment of the institutions of the stock market, low export revenues and withdrawal of capital outside the country. In Ukraine, instead of the national stock market, a "dispersed" model of the securities market was formed, characterized by an oligopoly (a small number of large players), the absence of independent control mechanisms over the formation of asset prices, insufficient protection of property rights as a result of corruption mechanisms within society. Additional negative factors from the point of view of investors remain military operations, exchange rate risks and the state of the national economy. As a result, in Ukraine, the securities market has not become a tool for capital redistribution. In their paper [1] Attar and others review the performance aspects of the investment asset portfolio management system through the use of the automated management systems. Such systems are based on software tools specially designed to help investors make decisions about buying or selling different types of securities. The au-

thors consider the most common methods and approaches used to select optimal investment strategies and maximize the profitability of assets. Such automated management systems analyze the structure of assets in the investment portfolio as well as the degree of riskiness and suggest choosing appropriate tools for risk management, asset placement strategies, and prepare reports on the efficiency of the investment portfolio. Krishnamoorthy& Mahabub [9] focus on the investment portfolio construction. The authors consider such an activity as a process being equally important for both investors and the capital market. The paper proposes an approach optimizing the selection of securities for an investment portfolio based on data from the Bombay Stock Exchange. A dynamic model of the illiquid assets' portfolio formation is presented in the paper by Dimmock et al. [6]. The described model is widely used by institutional investors, including pension funds, university sustainability funds, and national welfare funds. It explains how the liquidity, caused by asset lock-in, is connected with the illiquidity, resulting from transaction costs in the secondary market, and making the market equilibrium vary due to time changes and the influence of endogenous factors. Paper by Ortiz et al. [16] evaluates the efficiency of firms under the condition of automating the processes to form investment portfolios using so-called Robotic Process Automation (RPA). Sun et al. [20] examine the impact of investment as well as the globalization process on the economic growth of companies from different countries taking into consideration the risk of capital investments and demographic increase. As it can be seen from the study by Maji et al. [11], investing in the stock market allows generating a higher level of profit compared to investing in other financial instruments. A framework model of capital allocation was described for creating an investment portfolio of mutual funds based on forecasting the value of shares by the method of curve fitting. In another paper, its authors [7] try to determine the optimal amount of invested funds per share of the listed company. For the purpose, the time of securities purchase, and the type of transaction with the securities (sale or purchase) were taken into account to reduce investment risks and maximize the overall profitability of the firm. Paper by Verma et al. [23] proposes to use the methods of Multi-Criteria Decision Making (MCDM) and Deep Learning to select the stocks worth buying owing to the ability of neural networks to determine the typical past behavior of the system and predict the next day stock quote using Technical Indicators. Cheng et al. [4] discuss various forecasting methods for working in the stock market where both classification and comparative evaluation of securities portfolio management methods is proposed. Paper by Ye et al. [25] suggests a new State-Augmented investment management framework aimed at solving the problem of data heterogeneity and environmental uncertainty as the two main challenges for financial managers. The importance of investment diversification in the management of the company assets, involving changes in the amount of real income, is considered in the paper by Deb [5]. Ukrainian scientists [22] consider the peculiarities of investment and credit activities of banks in the interbank market, considering the financial globalization. Muminov et al. [14] systematize the existing views on the attraction of direct foreign investment, and identify trends considering the globalization processes of the world economy. Particular attention was paid to the attraction of direct foreign investments, namely in the form of investments in securities from international investment companies and hedging funds; various internationalization stages of enterprise activities were considered; and the influence of internationalization level of economic activity on the volume of direct foreign investments was analyzed.

Materials and methods.. The study is based on the regulatory documents of the National Bank of Ukraine; legislative acts, regulating the activities of companies in Ukraine; and data on the dynamics of securities quotations on the stock market of the United States and worldwide. The efficient market theory is theoretical basis of the study. In our paper, we have applied a number of stated below methods to study the process of investment portfolios management of a company:

• comparison, generalization, synthesis, and critical analysis to examine scientific works on investment and strategic management, determining the trends of research and practical approaches to managing an investment portfo-

lio;

• economic and mathematical modeling to determine asset ratios when forming portfolios according to various investment strategies;

• methods of mathematical statistics to identify interdependencies between prices of financial instruments and their numerical characteristics;

• observation and systematic analysis to define the reasons for the uncharacteristic behavior of some financial instruments during the study; and

• methods of induction and deduction to form conclusions in the study process.

There are two main approaches to forecast market quotes: fundamental and technical analysis. The former deals with various economic indicators, political events, weather conditions etc. The latter depends directly upon the market quotations. The abovementioned approaches have their own strengths and weaknesses. The main goal of each type of analysis is to determine the most accurate forecast for the price of a share, commodity or currency during a certain time in the future.

Among the main approaches of technical analysis during the formation of investment portfolios of enterprises, following methods can be distinguished:

• method of graphical analysis. For forecasting, tools are used to show graphically the nature of changes in the stock market. The specific approach is considered to be effective if combined with other methods. Disadvantages include the significant influence by the subjective psychological factor;

• forecasting based on data smoothing. Markets, characterized by a gradual change in trends; nonavailability of sharp jumps in quotations; and the presence of pronounced trends, are attractive. Since there are few such markets in reality, the methods are mainly used in combination with other tools and procedures of technical analysis of financial markets;

• regressive methods. While using them, multiple regression models are constructed, which coefficients are selected relying upon the past observations. They show stable results in calm markets, but do not adapt well to sudden changes [18];

• Box-Jenkins methods being similar in nature to regression methods;

• harmonic Fourier analysis, when the dynamics of stock market asset prices are presented in the form of series (also known as "Fourier integrals"). The method is called spectral because it allows finding the spectrum of amplitudes of some stationary process. The main argument for the impossibility of effective use of the approaches is the unstable spectrum. From a technical point of view, this makes it very difficult indeed to use spectral methods for market analysis;

• non-linear methods of economic and financial information analysis. Under the conditions of growing chaos in the financial sphere, traditional linear methods are increasingly unable to recognize key breaks in market trends thus forcing us to return to the ideas in terms of which the change in market indicators over time is not a purely random phenomenon [19].

A completely different approach is offered by the theory of dynamic systems or the theory of chaos. With the help of this theory, it is possible to identify stable trends that determine order and some structure among phenomena that were previously considered as random. The main assumption is that the behavior of the system proceeds from many nonlinear interactions; as a result, even small changes in the initial data can lead to completely different subsequent behavior of the system [13]. The research tendency has been recognized by practitioners because it is consistent with their intuitive ideas that there are certain regularities in the change of financial market indicators, which can be accepted and based on which you can build your investment and trading activities [25]. Such regularities can be obtained while examining time series or cross-sectional analysis. In any case, the use of neural models brings a tangible profit, and this is well consistent with Herbert Simon's thesis about the "limitation of intelligence", according to which market efficiency is affected by limitation of a person in the ability to process information analytically. It should be noted that neural networks are capable of detecting non-linear dependencies in the absence of priori knowledge of the basic model [23]. They can be used wherever linear methods and estimation using standard static methods are usually used. The behavior of the market is quite satisfactorily described by the so-called hypothesis of market efficiency, accord-

ing to which all available information about current and future events is discounted into current market prices in such a way that price changes are caused only by the appearance of fresh information [10]. In the short-term perspective, on the contrary, new possibilities for forecasts appear, related to numerous technical and structural factors. However, reality shows that the behavior of financial markets cannot be described by linear trends. Market collapses in the absence of significant changes in information, changes in access conditions and terms when the company crosses some invisible threshold in the credit sphere with manifestations of non-linearity [4]. The traditional assumption is that non-institutionalized individual investors (individuals and households) mainly invest in securities, and their investments in physical capital (fixed assets) are mediated through participation in the functioning of capital markets where securities are traded. Thus, from the point of view of investment theory, the key issue of management is determining the investment behavior of individual investors (households and individuals), whose preferences are exogenous from the point of view of the enterprise-recipient of capital, as they are formed under the influence of significant volumes of information coming from various sources.

Aim of the paper. The paper purpose is to analyze and systematize approaches to the innovative development of Ukrainian companies based upon the investment portfolio formationm and application of project management approaches use in the context of integration into regional (European) and global capital markets.

The continuous process of evolution of financial markets causes a change in approaches to investment management, portfolio formation, and selection of optimal solutions.

The paper objective is to describe behavior of financial markets from the viewpoint of the efficiency hypothesis using the example of the US stock market, since it is of greatest interest to Ukrainian firms as for access and attraction of capital.

At the same time, the paper authors shape a hypothesis according to which understanding of trends, concerning structural changes of stock markets, is the condition to form investment portfolios of Ukrainian companies, and assess reliably their conditions for implementation of the investment decisions.

Results and discussion. Relying upon the study results, it is possible to state that investment risks may be minimized through the approaches of price forecasting using the stable interdependencies formed in the stock market. Forecasting is the element of knowledge economy as well as the result of technological changes owing to which management of a firm, entering share market as an investor, is permitted to process mass data and identify regularities. The regularities help forecast the behavior of such stochastic systems as stock markets. As opposed to the available approaches, the proposed one involves correlation relationships; properties of stationary time series; and methods of technical analysis of stock markets. The conclusion supports Steiner & Vittkemper [19] hypothesis.

Analysis of the transformation phenomena, taking place in the current stock markets, has helped conclude that the majority of operating trading systems and models do not meet the requirements of conservative investors seeking to minimize risk while investing.

The following is also worth mentioning. Improvement of the available approaches to form and manage investment portfolio is the important factor stipulating expediency of the development of innovative theoretical and methodological as well as applied strategies of management of firms as for formation of low-risk investment portfolio. The conclusion coincides with the assumptions made by Whistler [24] as for risk hedging through statistical methods.

The unsolved problem of Ukrainian stock market is its inadequacy. The abovementioned depends upon the lack of institutionalization in the form of potent stock markets as well as small number of potential investors, and insufficient investment volume. High crediting rates of businesses are not attractive for residents to involve bank finance for implementation of medium-and long-term projects. The matter is that such a “long” investment is the necessary condition for the development of “new industrialization” of the country. The term is understood by the authors as progress of the modern enterprises of military-industrial; initiation of

new businesses on the basis of the displaced industrial facilities; and establishment of new hi-tech production branches. We believe that in the context of high investment risks, stipulated by foreign exchange fluctuations as well as dynamic nature of government regulation, it is not expedient to agree unequivocally with the opinion of Ortiz & Costa [16] as for complete transition to RPA systems.

Consequently, at the current stage of financial market development, financial managers cannot rely upon such a result, which will satisfy investors if the only approach to form investment portfolio is applied. The problem is search for optimum combination of the classic theories while forming the portfolio and the new possibilities of statistical analysis, and RPA systems. It is obvious that some firms try to solve the problem while investing in crypto currency as a paper by Tarasova et al. [21] describes. It is necessary to recognize that the problem of efficient and low-risk trading strategy formation remains understudied. It involves search for new optimization paths, and use of new approaches to identify interdependencies within financial markets, which can be applied due to changes in behavior of capital market players as well as in analytical tools supporting investment decision-making. The idea complements conclusions stated in papers by Verma et al. [23].

The technological revolution had caused by the widespread use of computers and new means of communication, led to radical changes in production, trade, and especially in the financial sector, particularly around stock markets [25]. To develop investment strategies, improve the management of stock markets, and rationalize the interaction system, it is necessary to understand trends in structural changes of stock markets and the dynamics of such changes [24]. The increasing internationalization of market operations structure in recent years is kind of a reason for the growing interest in non-linear methods of financial market analysis. When stock market sectors with relevant long-term agreements are analyzed, an expert should consider the following factors that influence decisively on stock prices:

1) interest rates and exchange rates;
2) economic growth rates and indicators;
3) price trends; and
4) earnings indicators.

The ability to recognize patterns and derive generalizing rules is the common feature of the new methods forming investment portfolios of a company. Neural networks and genetic algorithms are the essential components of management decisions on investment in securities. The methods are data-driven opposed to the rule-based approach adopted in expert systems [7]. Knowledge-based systems have their drawbacks: the trading methods, based upon them, have turned out to be quite unnecessary. Such systems become popular in various spheres of human activity; among other things, it concerns innovative management where access to relatively cheap financial resources is of critical importance. Right availability of the financial resources makes it possible either to develop new technology or copy them; advance new industries; and optimize structure of the national labour market and domestic economy depending upon the global demands since the ability of companies to enter the international market with a competitive offer of goods and services makes them viable. It goes without saying that while searching for financial resources, management of such firms may consider banks (in fact, their consortia and alliances if large-scale projects are implemented) and stock markets as the sources. From the viewpoint of management, stock markets have numerous significant advantages: they do not require payment for the use of capital; do not have return basis for the borrowed capital; and are not limited by the term maturities as in the case of lending. Moreover, stock market behavior is predictable (at least, in their majority). Hence, from the viewpoint of knowledge economy, the array of information, accumulated by market participants, concerning volatility of securities prices as well as behavior of players during the past periods becomes the reliable base to forecast future dynamics of the market.

From the viewpoint of investment theory, economic agents in the market belong to one of the two groups:

1) production companies that have own means of production and issue securities on the market for additional capital attraction in the development of fixed assets and operational technologies,

2) intermediary firms that own financial assets and issue securities for the purpose of attracting capital.

Traditional assumption is as follows. Noninstitualized individual investors (i.e. individuals and households) invest mainly in securities; their investment in physical capital (permanent assets) is mediated at the expense of participation in the functioning of capital markets where securities are traded. In such a way, from the viewpoint of the investment theory, the key management problem is to identify investment behavior of the individual investors (i.e. individuals and households) which preferences are exogenous from the standpoint of enterprise-recipient of capital since they take shape under the influence of significant volumes of information having various sources.

Depending upon the income and profitability indicator of market capitalization assets, distribution analysis of companies within the USA stock market in 2023 help conclude the following (Figure 1):

1) ROA indicator of the majority of the companies is up to 15% per year;

2) annual income is up to USD10 billion; and

3) market capitalization is up to USD60 billion.

For individual and institutional investors, the important issue is the targeted use of funds, compliance with budget and time constraints, and in the case of commercial projects, also the effectiveness and return on investment. The model recommended by the European Commission, known as (PM)2 [3], is a convenient tool for project agencies, allowing its employees to implement complex projects, including both business and non-commercial projects. This approach allows top management of high-tech organizations to apply a systematic cascade approach to planning and executing work. When implementing large infrastructure projects, consistency and structuring of work are important, which makes it impossible to introduce an agile management methodology. A feature of the (PM)2 model is “integration” - a process aimed at ensuring the consistency of all project components, taking into account maturity levels. If at maturity level 1 project plans do not have a structured form and a project management information system is absent, then at maturity level 2 the basic project plan and the project organizational structure are determined. Among project management methods, Scrum occupies a special place, since combining its elements with classic project management methodologies allows for improved feedback between investors and project managers. Such advantages are explained by the fact that a business project is divided into subprojects, which are distributed by the owner according to the priority of tasks, the main parts of which are carried out in a sprint for implementation during iterations lasting from two weeks to a month [2]. In the case of investing foreign funds in the development of high-tech industries, in particular, firms working with information technologies, the issues of digital transformation of business models will become relevant. In turn, such transformation will again require additional resources from external sources of borrowing.

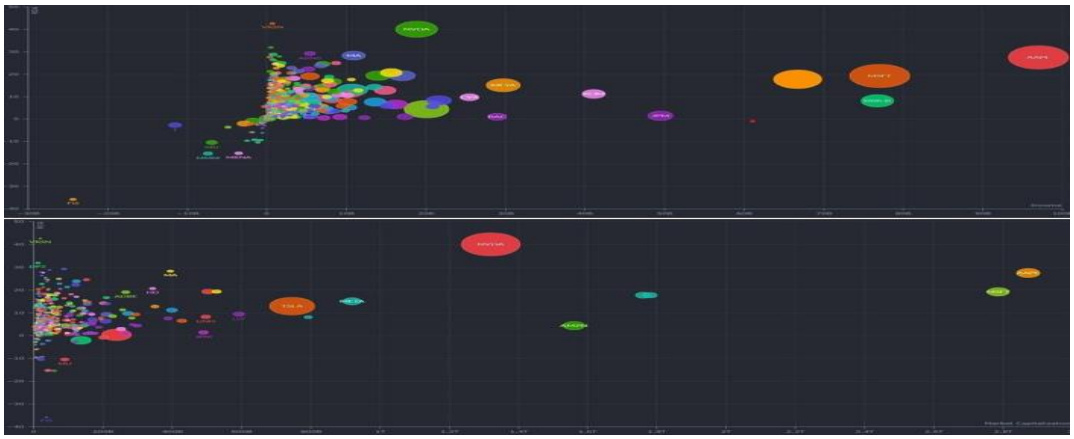

Figure 1. Distribution of the world largest companies by market capitalization income and indicator of profitability of assets in 2023

Source: [8]

Currently, a foreign exchange factor is very important for globalization in operations at the world markets. Fluctuations in the exchange rates of the leading Western economies influence heavily the financial flows between the markets of the USA, Japan, and Western Europe [5]. In terms of the fourth quarter of 2023, synchronicity in the fall and rise of index quotations in the financial markets of the USA, Germany, and the Great Britain is observed offering an opportunity to increase the scale of fluctuations as well as duration of their cycles. Figure 2 demonstrates the phenomenon.

Figure 2. Comparison of fluctuations of the largest world stock indices in the fourth quarter of 2023 (relying upon the data reporting of the USA stock market)

Source: [8]

Currently, movement of security prices is supported by:

1. high information transfer rate;
2. information openness and transparency at the national stock markets;
3. amount of cross-border transactions with securities;
4. role by institutional investors; and
5. accessibility to the national stock markets of issuers and non-resident investors.

More capitalized and globalized markets attract greater number of players; in this regard, exchange control features are quite important. The features are identified by the National (Central) bank or its analogue as well as range of the domestic economy. Currently, the leading positions among the capital markets continue to be maintained by the United States despite the increased competition from European and Asian trading platforms. Table 1 explains distribution of capital (market capitalization) at the USA stock market in terms of the world countries.

Table 1

Distribution of capital at the USA stock market in terms of the world countries (the year of 2023)

#	Name	Stocks	Market Cap
1	USA	4491	52539.60B
2	China	229	721.48B
3	Canada	228	1692.36B
4	Israel	114	163.98B
5	United Kingdom	100	2026.22B
6	Singapore	46	40.19B
7	Brazil	44	441.05B
8	Hong Kong	43	16.76B
9	Bermuda	42	163.52B
10	Ireland	32	805.95B
11	Switzerland	25	605.69B
12	Germany	21	256.40B

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13	Cayman Islands	21	80.74B
14	Australia	20	201.59B
15	Greece	20	7.41B
16	Japan	18	736.53B
17	Netherlands	18	525.65B
18	France	18	328.51B
19	Luxembourg	18	114.32B
20	Mexico	15	136.30B
21	Argentina	15	20.64B
22	Malaysia	14	689.36M
23	Taiwan	13	596.85B
24	South Korea	12	90.48B
25	India	11	387.44B

Source**:** [8]

Stock indices have certain disadvantages; any indicator is limited by its application field. In addition, it should be used carefully [14]. It is worth mentioning that among the mentioned minuses, the following is the key one. Intrinsically, the indices involve quantitative changes in the market price per share; nevertheless, they ignore the reasons causing such changes. Table 2, calculated relying data by [8], shows that correlation of the majority of indices of the largest stock markets, which is more than 0.65 denoting significant interdependence. However, the indices represent rather broadly the intensity of market stock trade.

Table 2

Correlation Table of indicators of the world share markets

Index	DJIA	S&P 500	NIKKEI	FT-SE	DAX	CAC-40	Bovespa
S&P 500	0.961						
NIKKEI	0.437	0.465					
FT-SE	0.641	0.655	0.52				
DAX	0.694	0.721	0.556	0.773			
CAC-40	0.679	0.715	0.530	0.850	0.910		
Bovespa	0.592	0.623	0.395	0.435	0.462	0.473	
Hang Seng	0.501	0.527	0.491	0.423	0.536	0.525	0.378

Source: Authors' calculation

Based upon the analysis of portfolio investment theories, it is possible to conclude that the investment portfolio formation relies upon following fundamentals:

1)optimization of ratio between the indices of profitability, risk, and liquidity of assets, purchased by a company, depending upon the specific goals of its investment strategy to preserve financial stability of the business;

2)inclusion of various investment objects and alternative investment in the investment portfolio to improve reliability, profitability, and reduce investment risks at the expense of diversification;

3)manageability of an investment portfolio. First of all, the principle concerns limitation as for the investment number, its complexity, profitability, risk, liquidity etc.

Use of neural networks as addition to the parameter of investment portfolio manageability improves profitability indicators as opposed to technical analysis of a stock market. Neural network has not any limitations as for input information nature; moreover, it can apply various datasets. Indicators of the price environment for stock assets during the specified period may be among them as well as information concerning changes in other market instruments, and external events which influenced behavior of the market instruments.

Such institutional investors as insurance companies and pension funds, having large portfolios, apply neural networks actively. Consequently, correlations between different markets are especially important for them. As against technical analysis, based upon general

recommendations and investment practices, neural networks are able to construct optimal forecasting model being adaptive and changeable together with the market which is especially important for the current dynamic financial markets [15]. Financial neural networks rely upon the fundamental assumption: it cannot forecast future; it searches for situations in the current market, which were available before, and simulates the market response with maximum accuracy.

It is common knowledge that while changing trend, it is worth updating data to manage investment portfolio efficiently [22]. It should be mentioned that the moving average, being the oldest and the most popular indicator of technical analysis, defines tendency of changes relying upon the analysis of datasets from the past periods; hence, it is a trend indicator. Construction of the moving average should involve fluctuation of prices in the market (its volatility); trade tool and the transaction period, i.e. how long the deals are open. It should be noted that the longer trading period is, the more averaged nature must the moving average have [12]. Depending upon the goals and trade strategy, different types of the moving average are applied as well as their combinations. Resulting from the analysis of the current methods to manage investment portfolio, it is possible to mention that simultaneous use of the simple moving average, exponential moving average, and the smoothed moving average is more efficient toolkit. All the moving averages have proper arguments; moreover, they are adjusted individually depending upon the trading strategy, time interval, tools, and other conditions. While having equal adjustment periods, each moving average will be unique.

Simple moving average (SMA) is calculated as an arithmetic mean value of individual periods (minutes, hours, days etc.) for the selected period of time. Exponential moving average (EMA) is more sensible to change in price. It is calculated as SMA but places a priority on the nearest data periods rather than those being close to the period termination. The smoothed moving average (SMMA) prefers data within the calculation period 'tail' rather than closer values. Owing to the fact, SMMA indicator is not sensible to impulses, and smoothes front portion of a curve paying more attention to the general trend.

Complementary study of the stock market dynamics by its major branches taking into consideration its trade volume, helps perform extra filtration of price quotation noise. Table 3 demonstrates analysis of the USA stock market dynamics in 2023 with distribution by the major branches of economy.

Table 3

Distribution by the major branches of economy

#	Name	Perf Month	Perf Quart	Perf Half	Perf Year	Perf YTD	Volume
1	Basic Materials	3.45%	9.19%	3.60%	2.99%	-3.60%	327.99M
2	Communication Services	3.49%	5.92%	13.96%	45.04%	0.53%	448.37M
3	Consumer Cyclical	1.79%	9.73%	3.59%	26.20%	-2.22%	1.14B
4	Consumer Defensive	3.36%	8.61%	-0.13%	-2.19%	0.65%	277.14M
5	Energy	2.48%	-4.18%	2.36%	0.55%	-1.46%	527.61M
6	Financial	4.98%	13.08%	10.57%	11.69%	-0.28%	1.62B
7	Healthcare	7.79%	8.63%	7.66%	5.54%	2.79%	1.55B
8	Industrials	3.58%	9.55%	3.09%	12.71%	-2.22%	661.96M
9	Real Estate	4.59%	13.85%	0.75%	1.87%	-1.34%	301.72M
10	Technology	2.86%	12.21%	8.69%	49.70%	-1.55%	1.25B
11	Utilities	2.51%	12.08%	-2.20%	-7.91%	1.35%	136.16M

Source: Authors' calculation

Following disadvantages of technical analysis indicators should be mentioned:

1) delayed nature (the averages delay while increasing and falling. If the movements are sharp then difference with actual

price may be rather significant; the moving will respond to changes and the trend may redirect back);

2) they are efficient only during the trend (sideways trend they can entangle and will not demonstrate any certain direction of price movement);

3) false signals (high market volatility results in origination of numerous false signals for purchase or sale).

Taking into consideration the proposed analysis tools for stock market, Fig. 4 describes a stage of investment decision making. While generalizing the current approaches to the process of investment portfolio formation under the condition of Ukrainian economy integration from the viewpoint of residential businesses, which can become potential participants of the world capital markets, it is possible to identify the key steps for implementation of investment decisions:

- harmonization of investment provisions with foreign investment legislation;
- determination of the foreign investment form;
- determination of the foreign investment objects;
- determination of the portfolio investment approach (diversification, manageability, risk-profit ratio);
- analytical conclusions as for the most efficient indicators to make decisions involving synchronism, volatility, and the market response to commercial news;
- automation of the investment process taking into consideration the analytical conclusions concerning the most efficient indicators based upon trading robots; and
- analytical conclusions as for optimality of the investment decisions, and correction of rules concerning the selected trading model.

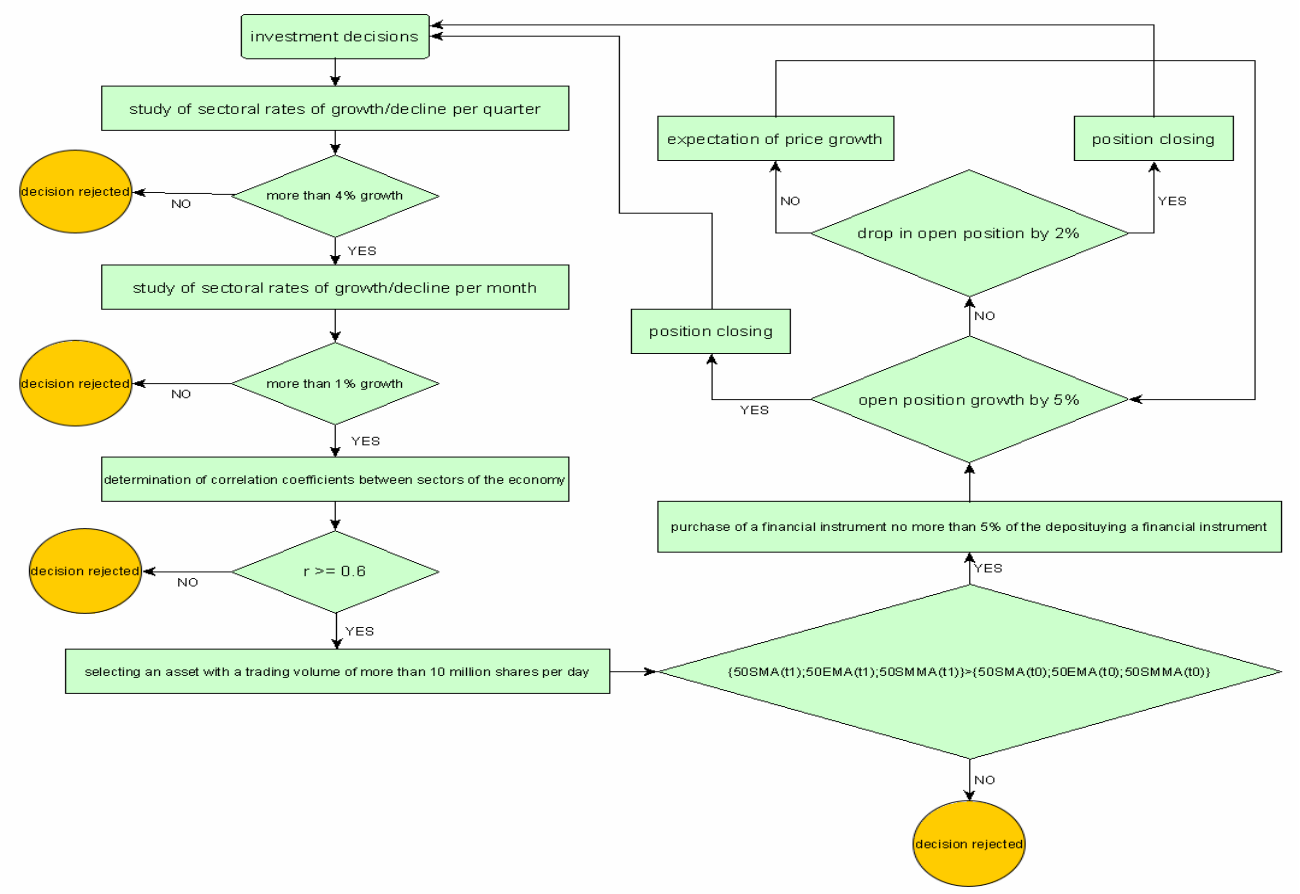

Figure 4. Trading session algorithm involving analysis tools proposed by the paper
Source**:** Designed by authors

Project management in organizations retains the classic idea of the need to divide a project into phases, but it fundamentally differs in understanding the sequence of execution of

such phases. Among the project management methods common in modern management, the most common mentions are the cascade (classic) and agile approaches [2].

According to the ideas of the process approach, a project is a unique process, which is a set of interconnected coordinated subprocesses. Project management as a process involves achieving a goal in accordance with defined requirements, taking into account constraints on time, cost and quality indicators. From the point of view of the process approach, it is advisable to distinguish two groups of processes related to the project: 1) project management processes; 2) project life cycle processes [2].

In EU countries, the Prince2 methodology (Projects In a Controlled Environment) has become widespread, a distinctive feature of which is a process approach to the preparation, implementation and closure of a business project, when each project is described using input and output elements together with identified goals that must be achieved, as well as tasks at specific stages of transition between individual phases [3].

Conclusions. It is the important component of Ukraine's integration into the global market to develop such an institutional environment which would involve the national legislation adaptation for the European Union standards and ensure reliable protection of rights of stakeholders, supplying them with adequate and available financial information and supporting them with high level of responsibility of financial mediators and corporate management to investors. Namely, formation of the described institutional environment will create prerequisites for innovative development of the national industrial corporations; the accelerated economic growth; support of the financial market operations; and positive foreign balance of Ukraine owing to the increased investment in securities and harmonization of legislation as well as management practices with requirements as to accession country; finally, for our state integration into the world financial market. In the context of Ukrainian companies, attracting investment within the global stock markets needs permission by a regulator (i.e. the National Bank); generally, it also involves the establishment of foreign affiliated holding or an investment company which will take part in the investment activities. However, the complex procedure cannot stop companies since it becomes more and more problematic to cover such a capital requirement inside the country and the need to renovate business models of firms becomes more urgent. Problems of investment portfolio strategy management on the basis of forecasting of economic process dynamics remain important for business administration. Nevertheless, the managerial decisions, resting upon the data of the previous situations to assess the potential of similar situation rise in future, become more and more automated. Moreover, they are based upon the use of AI elements to plan possible investment scenarios. Taking into consideration the abovementioned, access to innovative (breakthrough) technologies or the ability to create them become the peculiar competitive advantages of firms as well as their potential to change their own business models involving the trends of stock market changes. In the process of formation of portfolio of marketable investment assets, the following is the key missions for investment manager: selection of adequate model for long-term management of financial assets; determination of profitability deviation from its average value for each type of the assets; and identification of connection density between profitability of the assets and the selected investment instruments. Availability of mass data on the market condition, influencing prices of the financial assets, complicates accurate system of human evaluation of the situation and actualizes the problem of computer intelligence use for real-time mass data processing at the level of the specific firm playing in the world capital market. Due to the complexity of data processing, the problem of selecting variables is still topical for investors since the variables are included in the model of management of the investment portfolio strategies and would be perfect to describe behavior of the analyzed object.

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УПРАВЛІННЯ ПРОЄКТАМИ ІНВЕСТИЦІЙНИХ ПОРТФЕЛІВ КОМПАНІЇ ТА ЇЇ ІННОВАЦІЙНОГО РОЗВИТКУ

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Методологія дослідження. Для дослідження особливостей використання проєктного менеджменту в управлінні іноземними інвестиціями було використано метод аналізу літературних джерел та узагальнення отриманої інформації. Для опису процесів формування інвестиційного портфеля в роботі було застосовано такі методи: порівняння, узагальнення, синтезу та критичного аналізу для вивчення наукових праць з інвестиційного та стратегічного менеджменту, визначення тенденцій досліджень та практичних підходів до управління інвестиційним портфелем; економіко-математичне моделювання для визначення коефіцієнтів активів при формуванні портфелів за різними інвестиційними стратегіями; методи математичної статистики для виявлення взаємозалежностей між цінами фінансових інструментів та їх числовими характеристиками; спостереження та систематичний аналіз для визначення причин нехарактерної поведінки деяких фінансових інструментів під час дослідження; та методи індукції та дедукції для формування висновків у процесі дослідження.

Результати. У статті представлено результати дослідження фінансових ринків США з точки зору залучення інвестиційних ресурсів для розвитку економіки України. Особливу увагу приділено можливостям використання гнучких та класичних методів управління під час реалізації інноваційних проєктів розвитку підприємств.

Новизна. Застосування штучного інтелекту в інвестиційному плануванні дозволяє фірмам отримати конкурентну перевагу завдяки доступу до передових технологій та адаптивності бізнес-моделей. Ці можливості підтримують стратегічне реагування на динамічні тенденції фондового ринку. Ключові завдання інвестиційних менеджерів включають вибір моделей довгострокового управління активами, аналіз відхилень прибутковості та оцінку кореляції між активами та інвестиційними інструментами, а також застосування навичок проєктного управління.

Практична значущість. У статті підкреслюється нагальна потреба України у переході до інноваційно-орієнтованої промислової моделі у відповідь на руйнування її старої виробничої бази під час війни. У статті наголошується на створенні проєктних офісів та розробці інвестиційних та інноваційних стратегій як важливих інструментів для залучення та ефективного управління іноземними інвестиціями.

Ключові слова: управління проєктами, проєктний менеджмент, управління інвестиціями, менеджмент, цифровізація, бізнес-проєкт, капітал.

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