

Historical Development of Portfolio Theory

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Portfolio theory occupies an essential place in modern finance, while portfolio management grounded on its achievements has been recognized as one of the main tasks of financial experts worldwide. Taking into account the previous, the research aims to understand the development process of portfolio theory profoundly and to familiarize the investment community with the basic features of each of its phases: traditional, modern, and post-modern portfolio theory, with inevitable comparative analysis of these theories and presentation of their positive and negative aspects. The rationale of implementing an analysis of the evolutionary process of portfolio theory lies in the intention to provide a systematic overview of the development of theoretical thought within this area and grounded on the belief that accumulated knowledge in the field of portfolio theory and portfolio management is one of the most valuable knowledge assets of contemporary society.

Key words: traditional portfolio theory, modern portfolio theory, post-modern portfolio theory

1. INTRODUCTION

Portfolio theory is at the heart of securities portfolio management, providing investors and portfolio managers with methods of analysis and selection of securities that allow them to achieve optimal return in line with investor goals.

Portfolio theory development took place through three historical phases: traditional portfolio theory (TPT), modern portfolio theory (MPT), and post-modern portfolio theory (PMPT). TPT relied on the analysis of individual securities. It was characterized by a simple, non-systemic, subjective, and insufficiently analytical approach to forming an optimal portfolio.

On the other hand, MPT relied on the analysis of portfolio characteristics. It improved financial theory and investment practice and, through an objective system-based approach, enabled the optimization of the relationship between the expected return and the assumed risk.

The development of this theory is considered a

generator of development and affirmation of portfolio management function. An even stronger and more precise framework for designing optimal portfolio came from PMPT, which avoids the known MPT errors. PMPT appeared due to the lack of compatibility of the MPT assumptions and market reality.

Given the above, the research subject is the analysis of the evolutionary process of portfolio theory that took place through the three previously described phases, with the aim of providing a systematic overview of the development of academic thought within this area.

The research will use a method of qualitative economic analysis with the intention to investigate the relevant financial literature and present the authors' views, all in order to come to valid conclusion on the research subject.

Taking into account the defined research subject and aim, the paper will, after the introductory remarks, present the basic characteristics of TPT. The following step will be the presentation of the potential advantages and limitations of MPT, which focuses on a rational investor who is unwilling to accept higher risk if compensation for taking risk is not higher return.

The fourth part of the paper will deal with PMPT that appeared in order to eliminate the shortcomings and limitations of MPT. Finally, the final part of the

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paper, conclusion, will summarize the views expressed and open questions considered important for future research.

2. BASIC CHARACTERISTICS OF TRADITIONAL PORTFOLIO THEORY

TPT appeared at the beginning of the 20th century. It played an important role in the world of finance until the publication of Markowitz's „Portfolio Selection“ article in 1952 [4]. Within TPT, there are two phases [9]:

- Individual skills and abilities – from the beginning of the 20th century until 1933. It was characterized by an extremely subjective approach based on subjective assessment, without any scientific and analytical basis.
- Beginning of professionalism – from 1934 to 1952. Stricter control of financial statements of companies listed on the stock exchange was introduced. Investors took a scientific approach to the analysis of financial statements of companies and securities. At this stage, portfolio management was based on a fundamental analysis of securities of which portfolio was compiled.

TPT emphasized the analysis of individual securities, while the analysis of portfolio characteristics was ignored. In other words, it neglected the correlation of return on individual securities that make up the portfolio. It was believed that the market was inefficient and that fundamental analysis users, based on an analysis of the company's internal financial statements, could exploit market inefficiency and achieve high return.

The basic characteristics of TPT are the adaptation of the portfolio structure to investors' needs and simple diversification based on the „law of large numbers“. Considering that investors preferred high over lower return, the portfolio consisted of securities with the best performance, i.e. with the highest expected return. However, the choice of investment based on its expected return was not sufficient. The fact that most investors invest funds in several different securities suggests that there are factors other than return, which must be taken into account [11]. Investors prefer return but have risk aversion [10]. Investing in two or more securities indicates that investors were aware of the existence of risk, but rated portfolio performance only on the basis of the rate of return.

The traditional approach to increasing the number of securities in the portfolio in order to reduce the overall portfolio risk is known as simple or naïve diversification. According to this approach, investment in 100 different securities bears ten times the lower risk of investment in 10 such securities. Therefore, if

investors want to eliminate risk, it is enough to invest in a large number of securities [3].

The most important representatives of TPT are: John Burr Williams, John Richard Hicks, and Dickson Hammond Leavens. These authors advocated simple diversification. In doing so, they isolated individual securities, i.e. they did not make investment decisions in the portfolio context. Also, they neglected the correlation of return on individual securities in the portfolio.

Williams [27] believed that the total portfolio risk could be eliminated by diversification. He claimed that future dividends were uncertain, but that investing in a sufficient number of securities can reduce risk to zero. Williams thinks that the „law of large numbers“ allows the actual portfolio return to be almost the same as the expected return. Therefore, investors need to invest in a large number of securities that promise high expected return.

Hicks [1] also advocated for a simple diversification based on a „law of large numbers“, stressing that the risk factor is important for two reasons:

- 1) it affects the expected investment period, and
- 2) it affects the expected level of return on investment.

He believes that, in conditions of risk, there are many more or less probable outcomes, and suggests the presentation of these outcomes using the expected value and the appropriate measure of dispersion, but does not indicate the measure itself.

In his work „Diversification of Investments“, Leavens [2] pointed to the need and importance of diversification. However, this author does not include correlation in his analysis, but proceeds from the assumption that return on securities is independent, i.e. uncorrelated. After the analysis, Leavens emphasizes that this assumption is not always in line with reality, i.e. that diversification between companies of one industry cannot protect investors from unwanted factors affecting the entire industry.

Further diversification between industries is needed. However, even diversification between industries cannot protect investors from cyclical factors that adversely affect all industries at the same time.

TPT did not recognize that the risk of individual investment is much less important than its contribution to the overall portfolio risk. Also, TPT did not see the importance of correlation, i.e. degree of connection of return on individual securities, when constructing a portfolio. Correlation is important, because it is important to think and decide in the context of a portfolio, not in the context of individual securities.

Traditional approach to portfolio management consists of the following important elements [24]:

- Investor investigation – includes an insight into their age, health, responsibilities, other assets, income needs, capital maintenance, liquidity, risk attitude, and tax status;
- Investment (portfolio) objectives – defined so that they relate to maximizing investor wealth that is a risk element;
- Investment strategies – involve research on a number of aspects, such as: a) the share of securities with fixed and variable return, b) shares of companies that pay high dividends and shares of companies with high earning growth, c) income tax and capital gains tax, d) transaction costs and capital gains realized by quick purchase and sale, e) maintenance of liquidity;
- Simple diversification – reduces return volatility, i.e. risk;
- Choice of individual investment – is done on the basis of: a) determining the internal value of shares and the comparison of that value with the current market value (fundamental analysis); b) experts' advice; c) insider information; d) newspaper advice on a good history of companies.
- Emotional investments – provide emotional security and satisfaction through investment in movable and immovable property, jewelry, household appliances, etc.;
- Speculative investments – bring fast earnings from market fluctuations;
- Growth investments – undertaken with a view to achieving capital gains rather than regular return, such as investment in gold, real estate, land, growth shares, etc.;

With the help of these types of investment, it is necessary to create an appropriate portfolio for each individual investor. Portfolios considered adequate for individual investors can vary considerably depending on the requirements that are set before them, investor's time horizon, thresholds of tolerated risks, and the expected cash return on investment [23]. If the primary investor demand is income stability, the portfolio will consist of high-quality long-term bonds. If the goal is liquidity and security, portfolio will consist of high-quality short-term bonds.

Therefore, traditional approach implies that portfolio manager needs information about the client first of all. The collected information on the client helps the portfolio manager to construct a portfolio that is in line with the client's needs. In a traditional approach, the portfolio manager estimates the complete financial plan of an individual or client [14].

The traditional approach to constructing a portfolio of securities is known as an interior decorating approach. TPT understood the selection of securities as a form of artistic work, i.e. a portfolio design. Portfolio managers and investment advisers who rely on the classic portfolio theory in their work are often referred to as "financial interior decorators" [23]. According to Vyas [26], when a building is constructed, its furnishing and interior decoration will depend on its purpose, i.e. the goal for which it was made. Similarly, the portfolio will consist of securities that will be in line with investor's investment goals and limitations.

An individual investor needs to carefully develop a portfolio that will meet their needs and the set investment goals. The investor has the following categories of investment opportunities [26]:

- Protective investments – protecting investors from life uncertainties; buying a life insurance policy is a good example of these types of investment;
- Tax-oriented investments – bring tax relief to investors;
- Fixed income investments – bring a fixed rate of return, such as investment in preferential shares, bonds, bank deposits, etc.;

Based on the above, it can be concluded that TPT was based on relatively simple analyses. It was characterized by a subjective and insufficiently analytical approach. There were no general rules for making decisions. TPT failed to provide a systemic approach to seeking and forming an optimal portfolio.

There was no normative modeling, i.e. no normative approach. There were no statistical measures and instruments to quantify risk and improve and complement the fundamental analysis based on accounting methods. Also, there was no mathematical foundation, nor precise answers that would encourage confidence.

3. POTENTIAL ADVANTAGES AND LIMITATIONS OF MODERN PORTFOLIO THEORY

MPT is a step forward in financial literature and investment practice. MPT is deemed to be created by Harry M. Markowitz, while a large number of economists whose theoretical attitudes in the second half of the 20th century contributed to the development of MPT are credited for its further development.

Among the most important, the following can be distinguished: William Sharpe, Jack L. Treynor, John Lintner, Jan Mossin, Richard Roll, Stephen A. Ross, and others. The emergence of MPT and the modern financial economy in general was marked by the publication of Markowitz's work „Portfolio Selection“ in the „Journal of Finance“ in March 1952.

MPT provides a mathematical framework for optimizing return and risk ratio, and goes a step further than TPT, since the focus shifts from the analysis of

individual securities to the analysis of portfolio characteristics. Portfolio as a whole becomes a decisive factor when making investment decisions, rather than individual securities within it. The basic principle of MPT is that return is a risk function that can be reduced by diversification. Unlike TPT representatives, Markowitz [4] dismissed simple diversification and „the law of large numbers“, as returns on securities are correlated mutually. Instead of investing in a large number of different securities, the MPT creator suggests investing in securities with low return correlation. In other words, instead of simple diversification of investment, Markowitz proposes efficient diversification of investment. In his 1952 paper, Markowitz provided mathematical proof that appropriate diversification can minimize portfolio variation at the given return level. He was the first to formally quantify trade-off between return and risk. Paying attention to how return on assets is correlated with other assets enabled the creation of a set of efficient portfolios that minimize risk at the given level of return, i.e. maximize return at the given risk level [3].

Roy [16] independently developed a set of efficient portfolios similar to Markowitz's. In his paper „The Early History of Portfolio Theory: 1600-1690“ published in 1999, Markowitz [8] described Roy's role and importance in setting the foundations of MPT, pointing out that, besides him, Roy can also be called the father of the MPT. The basic differences between the Roy and Markowitz analysis were that Markowitz required exclusively non-negative investments and proposed allowing the investor to choose a desired portfolio from the efficient frontier, instead of recommending the choice of a specific portfolio.

Perhaps the most important aspect of Markowitz's work is that he has shown that, for investors, the risk of individual securities is not so important as their contribution to the variance of the overall portfolio that depends on their covariance with other securities in the portfolio [17]. According to MPT, risk is not a variance of return on individual financial assets, but rather the interaction of these variances between each class of financial assets represented in the portfolio [12].

Markowitz's work in the field of portfolio theory deals with the way an investor who optimizes the portfolio needs to behave, while, later, Sharpe's and Lintner's work on the capital asset pricing model (CAPM) deals with the economic equilibrium, assuming that all investors optimize the portfolio in the manner suggested by Markowitz. Accordingly, Markowitz's work, on one side, and Sharpe's and Lintner's work, on the other, represent the first and second part of the microeconomics of the capital market [7]. Markowitz's portfolio analysis model, together with index models, which in the case of a large number of

securities more accurately determine a set of efficient portfolios, builds a normative portfolio theory. Normative portfolio theory tried to identify and suggest to rational investors rules for making investment decisions, i.e. the rules for creating efficient portfolios and choosing an optimal portfolio. Normative portfolio theory, with its main representative – Markowitz's model, is tasked with helping investors to locate portfolios with the lowest risk at different levels of expected return, i.e. with the highest expected return at different levels of risk.

On the other hand, the CAPM model and arbitrage pricing theory (APT) are the basic elements of a positive portfolio theory that explains how to evaluate assets in terms of economic equilibrium, with all returns the same on a risk weighted basis. Positive portfolio theory is also referred to as the theory of market equilibrium in conditions of uncertainty, or the capital market theory.

It is important to note that MPT simplifies financial reality a lot because it ignores: 1) transaction costs and taxes – in reality, these costs are high, especially in emerging markets where they range from 1-2% of portfolio value [13], 2) information asymmetry, 3) inefficiency of the financial market, 4) deviation from normal distribution – distribution of return deviates from normal, particularly during strong economic growth or financial crisis, 5) volatility of correlation – correlation of return on securities is changing daily, so it needs to be dynamically observed, 6) irrational behavior of investors – the latest research in the field of behavioral economics has shown that many investors do not follow the principles of rational behavior, 7) individual investor utility function as well as their relation to risk.

The basic assumptions of MPT, more or less distant from reality, are [10]: 1) the efficient market hypothesis (EMH), 2) asset returns are normally distributed random variables, 3) correlations between assets are fixed and constant forever, 4) all investors aim to maximize economic utility, 5) all investors are rational and risk-averse, 6) all investors have access to the same information at the same time, 7) investors have an accurate conception of possible returns, 8) there are no taxes or transaction costs, 9) all investors are price takers, 10) any investor can lend and borrow an unlimited amount at the risk free rate of interest, 11) all securities can be divided into parcels of any size.

According to MPT, investors make their decisions on the basis of the first and second moment of probability distribution – mean values and variances. MPT assumes that low returns are as possible as high returns, which indicates that distribution of return is symmetric, and that uncertainty always has the same

shape – the bell shape [20]. Also, MPT assumes that investors make their decisions at one time, as well as knowing probability distribution and utility functions.

The above assumptions hide the key shortcomings of MPT [13]:

- Choosing an optimal portfolio is not viewed as a continuous process of tracking changes and adjusting portfolio over time, but as a decision to be made on a one-time basis;
- The assumption about the infinite divisibility of securities, i.e. the possibility of buying or selling securities in unlimited proportions in practice does not stand;
- In conditions of the financial crisis, the correlation coefficients converge to one, so the benefits of diversification are reduced or even completely disappear. The portfolio risk becomes equal to the simple weighted sum of the individual risks of securities of which it is compiled.

The last shortcoming of MPT is also the biggest, because if MPT does not work, then when the investor needs risk protection most, the question of its general utility is raised.

Despite the many limitations in theoretical and empirical terms, MPT is widely accepted among institutional portfolio managers who use it both for portfolio structuring and for measuring portfolio performance. MPT helps market participants to make quick and reliable decisions on capital allocation, and thus contributes to the depth, liquidity, and efficiency of financial markets. This theory forms the ground of a number of studies and significant managerial decisions made. In its original form, it represented a conceptual framework that evolved over time and became an irreplaceable instrument of modern portfolio management.

The real controversy is that MPT, although many of its influential advocates have acknowledged its flaws and constraints, is widely accepted by the participants on the capital markets that rely on it when making important financial decisions. MPT is rooted in the financial system, and its mathematical base and precise nature of results give a sense of security and comfort [26].

4. SCOPE OF THE POST-MODERN PORTFOLIO THEORY

PMPT is an extended and advanced MPT. PMPT avoids the known MPT errors and provides a stronger and more precise framework for constructing optimal portfolios. It was developed in the nineteen-eighties at the Pension Research Institute in the USA in order to adjust MPT to market reality [25]. Prior to PMPT, it

was assumed that investors had homogeneous expectations, that variance and standard deviation were reliable risk measures, and that returns on financial assets followed normal distribution. The lack of compatibility of these assumptions and market reality has imposed the need to develop PMPT as an extended return-risk paradigm.

According to PMPT, each investor has a different minimum acceptable return (MAR), which they set as a goal. MAR is the investor's target rate of return, i.e. the rate of return an investor should make to avoid a bad result. MAR serves as the investor's personal benchmark when evaluating the results achieved, and the option of MAR selection makes PMPT better customized to an individual investor compared to MPT.

MPT defines risk as the total return volatility around the mean value and is measured by variance or by standard deviation of return. MPT treats all uncertainties in the same way: deviation above the mean value is treated the same as deviation below the mean value. Unlike MPT that associates risk with achieving an average return, PMPT claims that the investment risk should be linked to the specific objective of each investor, and that returns above this objective do not represent an economic or financial risk. According to PMPT, only volatility below the investor target return is considered risk. Return above the target creates uncertainty, which is nothing but a risk-free opportunity to achieve unexpectedly high return [15].

Thus, while MPT defines risk in the broader sense, i.e. as the possibility that the funds invested will yield a return that is different from the expected, PMPT sees risk in the narrow sense, i.e. as the possibility that the invested funds yield return lower than expected – i.e. lower than MAR. According to Todoni [25], return above MAR does not bring concern, but on the contrary, it represents a premium for bold investment – the so-called “good surprise”.

In other words, PMPT does not treat any volatility around the mean value as a risk, but only volatility below MAR (Figure 1). PMPT distinguishes between good and bad volatility, i.e. between the upside risk and the downside risk, and only treats the downside risk. On the other hand, MPT treats the overall risk (upside and downside).

Upside risk is the risk of a positive return deviation relative to MAR, and the downside risk is the risk of negative deviation of return relative to MAR. The concept of downside risk, as the key concept of PMPT, is not new. According to Sing and Ong [19], the concept of downside risk dates back to 1952 [16], and has experienced its full affirmation with the emergence of PMPT. The upside risk will be symmetrical to the

downside risk only if the mean value and MAR are the same numbers.

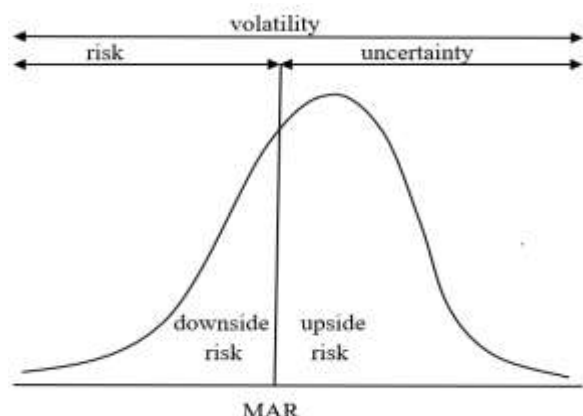


Figure 1 – Post-modern understanding of risk [15]

It is important to note that MPT, by equal treatment of positive and negative deviation from the mean value, overestimates the risk and imposes unnecessary conditions that exclude efficient portfolios when there is only a downside risk. It follows that, according to PMPT, variance and standard deviation are inappropriate risk measures. There are two key reasons why standard deviation cannot accurately represent risk [22]:

- Financial asset returns do not follow a normal distribution;
- Even if financial returns were perfectly symmetrical, standard deviation would still fail to describe human risk. Standard deviation represents a poor approximation of the investor's risk understanding.

Standard deviation treats return between MAR and maximum return of +1000% as risky because it represents dispersion around the mean value. Standard deviation considers the best possible return of +1000% as the most risky (Figure 2).

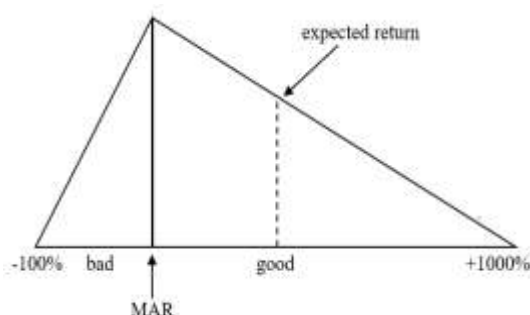


Figure 2 – Probability distribution [21]

Investors do not look at the risk in the same way. The risk is the fear of failure in achieving the set financial goal as a personal benchmark, which differs from investor to investor. Risk is much more complicated than simple variance or standard deviation. According to PMPT, investors see a downside risk as

a real risk – the risk of achieving a return lower than MAR, i.e. risk of failure in achieving MAR, and as a measure of downside risk they take a downside variance or a downside deviation. Downside variance is also called semi-variance in financial theory, and downside deviation is semi-deviation. Downside deviation can be defined as a standard deviation of negative return, i.e. return below MAR. Unlike variance as symmetric risk measure, semi-variance is an asymmetric risk measure. The downside risk statistic consists of the following components [22]:

- Frequency of return lower than MAR (downside risk frequency) – if return on assets was less than the target rate of return in 35 months of the observed 100, then the downside risk frequency is 35%;
- Average amount of deviation below MAR (average downside deviation);
- The largest negative deviation from MAR (downside magnitude) – the so-called “worst possible scenario”.

Downside risk statistic cannot simply replace the standard deviation in the formulas used in the model of portfolio optimization based on the return-risk ratio (Mean-Variance Optimization – MVO). A new method of analysis is needed, and measures such as alpha coefficient, beta coefficient, and Sharpe ratio must be replaced, as they are based on standard deviation. Instead of alpha, omega is used as return above MAR, and instead of Sharpe ratio, Sortino ratio is used, which shows the return surplus per unit of downside risk. The new optimization model used in PMPT is a portfolio optimization model based on the ratio of return and downside risk (Downside Risk Optimization – DRO). Portfolios created using MVO and DRO are often similar, and differences in absolute value of return and risk are small, since diversification gives results regardless of the method of measurement. However, DRO avoids the known MVO errors and is a more reliable model for selecting the best portfolio [22].

In contrast to MPT, PMPT believes that the investment return on securities and financial assets cannot be adequately represented by normal distribution. The MPT assumption that returns on assets are normally distributed random variables does not always correspond to reality, which makes PMPT use asymmetric distribution when optimizing portfolio.

When return on assets does not follow the bell-shaped symmetric distribution, MPT is inadequate. According to Rom and Ferguson [15], MPT became nothing more than a special symmetric PMPT case. Using downside risk and asymmetric return distribution, PMPT provides analysts with the necessary flexibility and precision when creating efficient

portfolios, which was not possible with the Markowitz methodology. Given that MAR differs from investor to investor and that it is used in determining an efficient frontier, it is clear that there is an infinite number of efficient frontiers – one efficient frontier for each MAR. So, while MPT talks about an infinite number of efficient portfolios along the efficiency frontier, which are defined with three variables, standard deviation, correlation coefficient, and return, PMPT points to an infinite number of efficient frontiers.

Although PMPT is considered to be an MPT upgrade, two important similarities between PMPT and TPT can be observed. First of all, PMPT and TPT encourage greater diversification of investment portfolio, compared to MPT. Also, both theories are better adapted to the individual investor than MPT in which the individual investor goal is not explicitly taken into account.

Finally, it should be emphasized that PMPT, as the last phase in the evolution of the portfolio theory, is not yet widely accepted. Therefore, MPT and its models form the basis of the largest number of papers in this field.

5. CONCLUSION

TPT is the first stage in the development of a portfolio theory that lacked mathematical-statistical foundation, normative modeling, portfolio analysis, efficient diversification of investment, and precise answers that would breed trust.

The mentioned deficiencies of TPT were eliminated by MPT, which provided an objective systemic approach to constructing an optimal portfolio. By respecting the investor's unwillingness to accept the high risk and their desire for the highest possible return, MPT enabled optimization of the ratio of the expected return and the assumed risk, i.e. the formation of a set of efficient portfolios, as well as the selection of an optimal portfolio that maximizes the investor's utility function.

A step forward in financial literature and investment practice is PMPT, which, when constructing an optimal portfolio, proceeds from heterogeneous expectations of investors, asymmetric distribution of return, and downside deviation as risk measures. An important novelty introduced by PMPT is MAR, which serves investors as an individual benchmark when assessing the results achieved.

Previous positions were developed with the aim of better understanding of the portfolio theory development process that started in the early 20th century and is still ongoing. The key limitation of the paper is reflected in the fact that the analysis does not include Behavioral Portfolio Theory (BPT), as the latest stage

in the development of portfolio theory. BPT is an integral part of behavioral finance, a relatively young and promising field of finance that is rapidly evolving and is applied in practice. Shefrin and Statman [18] developed BPT as an alternative to MPT. Unlike MPT that assumes investors are rational and financial markets efficient, BPT points out that investors are not always rational, and that financial markets are not always efficient. The key feature of BPT is that investors do not observe their portfolio as a whole, as suggested by MPT, but as separate layers of the mental account, where each layer of the mental account is linked to a specific goal and a certain level of risk tolerance.

Given the above, the proposal for future research is the analysis of BPT which, by incorporating psychological elements, could further enhance financial theory and investment practice.

REFERENCES

- [1] Hicks J. R, A Suggestion for simplifying the theory of money. *Economica*, Vol. 2, No. 5, pp. 1-19, 1935.
- [2] Leavens D. H, Diversification of investments. *Trusts and Estates*, Vol. 80, pp. 469-473, 1945.
- [3] Leković M. *Savremena portfolio teorija i ocena investicionih performansi [Modern portfolio theory and investment performance evaluation]*. Neobjavljena doktorska disertacija, Ekonomski fakultet Univerziteta u Kragujevcu, Kragujevac, 2017.
- [4] Markowitz H. M, Portfolio selection. *The Journal of Finance*, Vol. 7, No. 1, pp. 77-91, 1952.
- [5] Markowitz H. M, *Portfolio selection: Efficient diversification of investments*, John Wiley & Sons, Inc., New York, 1959.
- [6] Markowitz H. M, *Mean-variance analysis in portfolio choice and capital markets*, Basil Blackwell, Oxford, 1987.
- [7] Markowitz H. M, Foundations of portfolio theory. *The Journal of Finance*, Vol. 46, No. 2, pp. 279-287, 1991.
- [8] Markowitz H. M, The early history of portfolio theory: 1600-1690. *Financial Analysts Journal*, Vol. 55, No. 4, pp. 5-16, 1999.
- [9] Miletić S, *Portfolio menadžment [Portfolio management]*, Visoka škola za poslovnu ekonomiju i preduzetništvo, Beograd, 2013.
- [10] Omisore I, Yusuf M, Christopher N, The modern portfolio theory as an investment decision tool. *Journal*

- of Accounting and Taxation*, Vol. 4, No. 2, pp. 19-28, 2012.
- [11]Pantić N, Milojević I, Investments and employment in tourism in the Republic of Serbia. *Menadžment u hotelijerstvu i turizmu – Hotel and Tourism Management*, Vol. 7, No. 1, pp. 95-104, 2019.
- [12]Popović S. *Portfolio analiza – kvantitativni aspekti investiranja u hartije od vrednosti* [Portfolio analysis – Quantitative aspects of investing in securities], Modus, Podgorica, 2000.
- [13]Radivojević N, Lazić J, Cvijanović JM. Ograničenja primene savremene portfolio teorije na tržištima u nastajanju – primer srpskog tržišta kapitala [Limitations of application of modern portfolio theory in emerging markets – Example of Serbian capital market]. *Industrija*, Vol. 37, No. 4, pp. 1-13, 2009.
- [14]Ramesh G. B. *Portfolio management – Including security analysis*, Concept Publishing Company, New Delhi, 2007.
- [15]Rom B. M, Ferguson KW. Post-modern portfolio theory comes of age. *The Journal of Investing*, Vol. 2, No. 4, pp. 27-33, 1993.
- [16]Roy A. D, Safety first and the holding of assets. *Econometrica*, Vol. 20, No. 3, pp. 431-449, 1952.
- [17]Rubinstein M, Markowitz's portfolio selection: A fifty-year retrospective. *Journal of Finance*, Vol. 57, No. 3, pp. 1041-1045, 2002.
- [18]Shefrin H, Statman M, Behavioral portfolio theory. *Journal of Financial and Quantitative Analysis*, Vol. 35, No. 2, pp. 127-151, 2000.
- [19]Sing T. F, Ong S. E, Asset allocation in a downside risk framework. *Journal of Real Estate Portfolio Management*, Vol. 6, No. 3, pp. 213-223, 2000.
- [20]Sortino F. A, Satchell S. E, *Managing downside risk in financial markets: Theory, practice and implementation*, Butterworth-Heinemann, Oxford, 2001.
- [21]Sortino F. A, van der Meer R. Downside risk. *The Journal of Portfolio Management*, Vol. 17, No. 4, pp. 27-31, 1991.
- [22]Swisher P, Kasten G. W, Post-modern portfolio theory. *Journal of Financial Planning*, Vol. 18, No. 9, pp. 74-85, 2005.
- [23]Šoškić D. *Hartije od vrednosti: Upravljanje portfoliom i investicioni fondovi* [Securities: Portfolio management and investment funds], Ekonomski fakultet Univerziteta u Beogradu, Beograd, 2013.
- [24]The Institute of Chartered Accountants of India. *Strategic Financial Management*, 2013. Retrieved April 6 2019, from: https://finappfiles.files.wordpress.com/2016/11/ilovepdf_merged-ilovepdf-compressed1.pdf
- [25]Todoni M. D. A post-modern portfolio management approach on CEE markets. *Journal of Economics and Business Research*, Vol. 21, No. 1, pp. 84-97, 2015.
- [26]Vyas H. N, *Portfolio management*, Amazon International, 2014.
- [27]Williams J. B, *The theory of investment value*, Harvard University Press, Cambridge, 1938.

REZIME

ISTORIJSKE FAZE RAZVOJA PORTFOLIO TEORIJE

Portfolio teorija zauzima važno mesto u savremenim finansijama, a portfolio menadžment zasnovan na njenim dostignućima je jedan od osnovnih zadataka finansijskih stručnjaka širom sveta. Polazeći od navednog, cilj rada je bolje razumevanje razvojnog procesa portfolio teorije i bliže upoznavanje investicione javnosti sa osnovnim odlikama pojedinačnih faza razvoja: tradicionalne, savremene i post-savremene portfolio teorije, uz neizbežnu uporednu analizu ovih teorija i predstavljanje njihovih kako pozitivnih, tako i negativnih aspekata. Motiv za sprovođenje analize evolucionog procesa portfolio teorije leži u nameri da se obezbedi jedan sistematičan prikaz razvoja teorijske misli u okviru ove oblasti, a polazeći od uverenja da su znanja iz oblasti portfolio teorije i portfolio menadžmenta jedna od najznačajnijih i najpotrebnijih znanja savremenog društva.

Ključne reči: *tradicionalna portfolio teorija, savremena portfolio teorija, post-savremena portfolio teorija*