

Heri M. Markovic

Nobelova nagrada za 1990.



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TVORAC SAVREMENE PORTFOLIO TEORIJE

Rezime

Nobelova nagrada za ekonomiju dodeljena je za 1990. godinu Heriju M. Markovicu, Mertonu H. Mileru i Vilijamu F. Šarpeu za pionirski rad u oblasti finansijske ekonomije. Heri Markovic je dobitnik ove prestižne nagrade za ključni doprinos u selekciji portfolija. Rođen je 1927. godine u Čikagu. Na Čikaškom univerzitetu prve dve godine studirao je prava, a sledeće dve ekonomiju. Magistrirao je 1950, a doktorirao 1954. godine. Prvi posao bio mu je na Univerzitetu u Čikagu sa koga 1952. godine prelazi u RAND korporaciju gde je učestvovao u izgradnji velikih logističkih modela simulacije. Nakon deset godina odlazi u INC, a 1968. radno mesto mu je na Univerzitetu Kalifornija u Los Anđelesu. Pre nego što je postao član Fakulteta BC gradskog univerziteta u Njujorku 1982. godine promenio je još tri radna mesta. Osim Nobelove dobitnik je i prestižne Fon Nojman nagrade za 1989. godinu.

Ključne reči: Heri M. Markovic, Merton H. Miler i Vilijam F. Šarpe, Nobelova nagrada, Čikago, ekonomija, portfolio teorija, pozitivna portfolio teorija, normativna portfolio teorija, stopa prinosa, hartije od vrednosti, finansijsko tržište, efikasna granica, efikasan set, selekcija portfolija

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Harry M. Markowitz

Nobel Prize for 1990

FOUNDER OF THE MODERN PORTFOLIO THEORY

Summary

Nobel Prize in Economic Sciences was in 1990 awarded to Harry M. Markowitz, Merton H. Miller and William F. Sharpe, for their pioneering work in the theory of financial economics. Harry Markowitz is the winner of this prestigious award for his key contribution in portfolio selection. He was born in 1927 in Chicago. At the University of Chicago he spent first two years studying law, and the next two studying economics. He gained his MSc degree in 1950 and his PhD in 1954. His first job position was at the University of Chicago, which he left in 1952 to join RAND Corporation, where he took part in developing large logistics simulation models. After ten years, he joined INC, and in 1968 he worked at the University of California in Los Angeles. Before he became a member of the faculty of the BC City University of New York in 1982, he had changed another three job posts. In addition to the Nobel Prize, he is also the winner of the prestigious Von Neumann Award for 1989.

Keywords: Harry M. Markowitz, Merton H. Miller, William F. Sharpe, Nobel Prize, Chicago, economics, portfolio theory, positive portfolio theory, normative portfolio theory, rate of return, securities, financial market, efficient frontier, efficient set, portfolio selection

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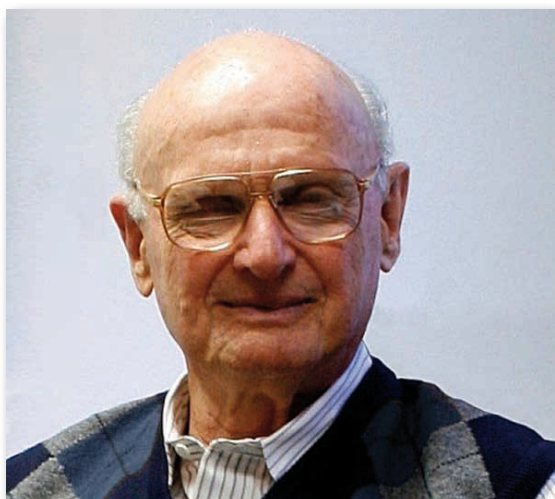
Nobelova nagrada za ekonomiju dodeljena je za 1990. godinu Heriju M. Markovicu, Mertonu H. Mileru i Vilijamu F. Šarpeu za pionirski rad u oblasti finansijske ekonomije. Doprinos nauci ove trojice nagrađenih je u revolucionisanju finansija uvođenjem i primeni kvantitativnih metoda u finansijskoj analizi. Heri Markovic je dobitnik ove prestižne nagrade za ključni doprinos u selekciji portfolija.

Biografija

Heri Markovic rođen je 24. avgusta 1927. godine u Čikagu kao jedino dete Morisa i Mildred. Roditelji su mu posedovali malu prodavnicu koja je omogućavala da i u vremenu Velike depresije Heri odrasta bezbrižno i ima uslove za željeno školovanje. Kao dečak, uživao je u popularnoj matematici, fizici, astronomiji i filozofiji, igranju fudbala i sviranju na violini. Nakon srednje škole upisao se na Čikaški univerzitet na dvogodišnje studije prava. Iako u detinjstvu Herijev san nije bio da studira ekonomiju, baš to je na istom fakultetu upisao 1947. godine.

Posebno ga je privukla ekonomija nesigurnosti kroz dela Džona fon Nojmana, Oskara Morgensterna, Jakoba Maršaka i Leonarda Savidža. Magistrirao je 1950, a doktorirao 1954. godine. Još dok je bio na univerzitetu izabran je za člana Koulz komisije za istraživanje koju je činila mala grupa budućih diplomaca pod vođstvom direktora J. Maršaka i T. Kupmansa.

Radeći na svojoj doktorskoj disertaciji na Univerzitetu u Čikagu, Markovic je razvio osnovni koncept portfolio teorije. U svojoj kratkoj biografiji za Nobelovu fondaciju istakao je da su se njegove osnovne ideje za portfolio teoriju rodile dok je čitao *Teoriju vrednosti investicije* (1938) Džona Bura Vilijamsa. U ovoj teoriji Vilijams ističe da je vrednost akcija jednaka sadašnjoj vrednosti njenih budućih dividendi. Svoju portfolio teoriju Markovic je prvi put objavio 1952. godine u časopisu *Journal of Finance*, a sedam godina kasnije u proširenom izdanju u knjizi *Efikasna diversifikacija investicija*. Od tada, kako ističe, sarađivao je sa mnogim ekonomistima na brojne teme, ali je fokus uvek bio na primeni matematike uz korišćenje savremene tehnike naročito na probleme



poslovnih odluka u uslovima neizvesnosti. Ponekad su primenjivali postojeće tehnike, a nekad su razvijali nove. Neke od ovih tehnika su, kako smatra Markovic, više uspešne od drugih, a uspeh se merio prihvatanjem tehnika u praksi.

Sa univerziteta u Čikagu 1952. godine prelazi u RAND korporaciju gde je učestvovao u izgradnji velikih logističkih modela simulacije. Nakon deset godina odlazi u INC, a 1968. radno mesto mu je na Univerzitetu Kalifornija u Los Anđelesu. Pre nego što je postao član Fakulteta BC gradskog univerziteta u Njujorku 1982. godine, promenio je još tri radna mesta.

Markovic naglašava da ne može da nabroji sve s kojima je radio, niti da opiše šta je sve s njima postigao, ali da svi oni dobro znaju kako je on posao doživljavao kao igru koja mu donosi radost. Fon Nojman nagradu osvojio je 1989, a Nobelovu 1991. godine.

Naučni rad

Upravljanje investicijama u hartije od vrednosti bazira se na teorijskim dostignućima iz oblasti analize i selekcije portfolija. Portfolio teorija koja je imala dve glavne istorijske faze, klasičnu i modernu, predstavlja analitički pristup selekciji i menadžmentu portfolija hartija od vrednosti. Moderna portfolio teorija je u osnovi svake savremene investicione analize. Novo poglavlje u razvoju portfolio teorije započeo je Markovic svojim antologijskim delom „Selekcija portfolija“ 1952. godine. Ova nova savremena portfolio teorija u svom razvoju imala je dva pravca: normativni i pozitivni.

Normativni obuhvata skup pravila kojih se treba pridržavati da bi se maksimiziralo

Nobel Prize in Economic Sciences was in 1990 awarded to Harry M. Markowitz, Merton H. Miller and William F. Sharpe, for their pioneering work in the theory of financial economics. Scientific contribution of these three awarded economists was achieved in revolutionizing finance through the introduction and implementation of quantitative methods in financial analysis. Harry Markowitz is the winner of this prestigious award for his key contribution in portfolio selection.

Biography

Harry Markowitz was born on 24 August 1927 in Chicago, as the only child of Morris and Mildred. His parents owned a small grocery shop which enabled Harry, even during the Great Depression, to grow up carefree and to have all the conditions for the desired education. As a boy, he enjoyed popular mathematics, physics, astronomy and philosophy, playing football and playing the violin. After high school, he enrolled at the University of Chicago for its two year program of law studies. Although it was not Harry's childhood dream to become an economist, it was economics that he chose to study at the same University in 1947.

He was particularly drawn by the "economics of uncertainty" through the works of John Von Neumann, Oscar Morgenstern, Jacob Marschak and Leonard Savage. He gained his MSc degree in 1950 and his PhD in 1954. While still at the University, he was selected a member of the Cowles Commission for Research in Economics, made up of a small group of future graduates under the leadership of its directors, J. Marschak and T. Koopmans.

Working on his doctoral dissertation at the

University of Chicago, Markowitz developed the basic concept of his portfolio theory. In his brief biography for the Nobel Prize Foundation, he underlined that his main ideas for portfolio theory were born while he was reading John Burr Williams's *Theory of Investment Value* (1938). In this theory Williams proposed that the value of a stock should equal the present value of its future dividends. Markowitz published his portfolio theory for the first time in 1952 in the *Journal of Finance*, and seven years later in an extended edition in his book *Efficient Diversification of Investments*. Since then, as he himself underlines, he has cooperated with many economists on many topics, but the focus has always been on the application of mathematical or computer techniques particularly to the problems of business decisions under uncertainty. Sometimes they applied the existing techniques, other times they developed new ones. Some of these techniques, according to Markowitz, were more successful than others, success being measured by their acceptance in practice.

In 1952 he left the University of Chicago to join RAND Corporation, where he took part in developing large logistics simulation models. After ten years, he joined INC, and in 1968 he worked at the University of California in Los Angeles. Before he became a member of the faculty of the BC City University of New York in 1982, he had changed another three job posts.

Markowitz emphasizes that he cannot acknowledge all the people he has worked with or describe what it was they have accomplished, but that, nevertheless, each of them knows that he often considered work to be play, from which he derived great joy. In 1989 Markowitz won Von Neumann Award, and in 1991 he was awarded the Nobel Prize.



Markovicov doprinos se sastoji u tome što je iznašao mogućnost izračunavanja strukture portfolija koji će na datom nivou rizika davati najveću moguću stopu prinosa.

Dejan Šoškić

Markowitz's contribution lies in the fact that he found the way to calculate the portfolio structure that would, given a certain level of risk, yield the highest possible rate of return.

Dejan Šoškić

Literatura / References

1. Šoškić Dejan, (2004), „Harry M. Markowitz, Merton H. Miller, William F. Sharpe“, str. 11-25, u: Pelević, dr Branislav (redaktor), (2004), *Ekonomisti nobelovci 1990-2003*, Beograd: Centar za izdavačku delatnost Ekonomskog fakulteta u Beogradu
2. "Harry M. Markowitz - Facts". Nobelprize.org. Nobel Media AB 2013. Web. 30 Dec 2013. http://www.nobelprize.org/nobel_prizes/economic-sciences/laureates/1990/markowitz-facts.html
3. Harry M. Markowitz, 1991, "Foundations of Portfolio Theory", *The Journal of Finance* Vol. XLVI, No 2
4. Amy E. Buttell, 2010, "Harry M. Markowitz on Modern Portfolio Theory, the Efficient Frontier and His Life's Work", *Journal of Financial Planning*

blagostanje ili ostvario željeni cilj. Pozitivni obuhvata teorije i modele koji objašnjavaju kako se ljudi ponašaju. Normativni pristup je težio da pruži odgovor kako bi trebalo da se ponaša racionalni investitor, a pozitivni se bavio ekonomskom ravnotežom, ali uz uslov da je ponašanje u skladu sa normativnom portfolio teorijom.

Normativna portfolio teorija bavi se ekonomskim učesnicima koji odlučuju u uslovima neizvesnosti. Kada bi investitor sa sigurnošću znao buduće prinose hartija od vrednosti, tada bi on bio samo zainteresovan za maksimiziranje očekivanog prinosa svog portfolija. U tom slučaju sa lakoćom bi odredio njegovu strukturu: opredelio bi se za jednu hartiju od vrednosti koja ima najveći prinos. Markovic, međutim, zaključuje da bi izbor portfolija koji samo maksimizira očekivanu stopu prinosa bio inferioran, jer se tada investitor ne bi opredeljivao za diversifikaciju portfolija jer njome, u uslovima pune izvesnosti, ne bi postizao ništa bitno. Ali, u realnosti, diversifikacija je, kao što znamo, racionalna investiciona strategija jer umanjuje uvek prisutnu neizvesnost investiranja. Dakle, neizvesnost je ključna za analizu racionalnog investicionog ponašanja. Otuda, portfolio teorija polazi od toga da su investitori zainteresovani, kako za prinos tako i za rizik svojih portfolija, tj. polazi od postojanja uslova neizvesnosti.

Dostignuća normativne portfolio teorije mogu se koristiti u praksi uz uslov posedovanja

dovoljnih kompjuterskih kapaciteta i neophodnih baza podataka. Tako je moguće iznaći, s aspekta srednje vrednosti i varijanse, efikasne portfolio kombinacije za veliki broj različitih hartija od vrednosti. Markovic je pokazao da je očekivana stopa prinosa portfolija prosto ponderisana aritmetička sredina očekivanih stopa prinosa hartija od vrednosti iz njegovog sastava.

Markovic smatra da za većinu realnih situacija sa finansijskog tržišta pravilno konstituisan portfolio omogućava smanjenje rizika bez gubitka na očekivanim stopama prinosa. Na osnovu toga, omogućio je da se identifikuju specifične kombinacije hartija od vrednosti koje na datom nivou rizika maksimiziraju stopu prinosa. Ove portfolije je nazvao efikasnim, a skup takvih portfolija nazvao je efikasna granica i efikasni set ili skup.

Pozitivna portfolio teorija izučava stanje tržišne ravnoteže pod uslovima da se investitori ponašaju u skladu sa normativnom portfolio teorijom. O njoj možemo govoriti i kao o teoriji tržišne ravnoteže u uslovima neizvesnosti ili teoriji tržišta kapitala. Ona pokazuje kako bi, pod određenim uslovima, trebalo vrednovati aktivu na tržištu kapitala. U osnovi pozitivne portfolio teorije nalazi se upravo Model vrednovanja kapitala - *Capital Asset Pricing Model* koga je razvio Šarpe, treći dobitnik Nobelove nagrade za ekonomiju u 1990. godini.

Autorski radovi

1. Markovic, H. M. (1952) "Selekcija portfolija". *Žurnal za finansije* 7 (1): 77-91.
2. Markovic, H. M. (1952). "Dobrobit bogatstva". *Žurnal za političku ekonomiju* LX (2): 151-158.
3. Markovic, H. M. (1957). "Eliminaciona forma inverzije i njena primena na linearno programiranje". *Nauka menadžmenta* 3 (3): 255-269.
4. Markovic, H. M. (1959). *Selekcija portfolija: Efikasna diversifikacija investicija*. Njujork: John Wiley & Sons.
5. Markovic, H. M. i E. van Dijk (2003). "Jednofaktorska analiza varijanse srednjih vrednosti u promenljivom svetu". *Žurnal finansijskih analitičara* 59 (2): 30-44.
6. Markovic, H. M. (2005). "Efikasnost tržišta: Teorijska distinkcija i šta onda?". *Žurnal finansijskih analitičara* 61 (5): 17-30.

Scientific Work

Managing securities investments is based on theoretical achievements in the field of portfolio analysis and selection. Portfolio theory, which has developed through two main historical stages, classical and modern, represents an analytical approach to the selection and management of a securities portfolio. Modern portfolio theory is in the basis of every modern investment analysis. A new chapter in the development of portfolio theory was started by Markowitz in his 1952 anthological work “Portfolio Selection”. The modern portfolio theory followed two development paths: normative and positive.

The normative approach refers to a set of rules to be followed in order to maximize the benefits or achieve a desired goal. The positive approach employs theories and models explaining people’s behavior. The normative approach has striven to answer how a rational investor should behave, whereas the positive approach has dealt with economic equilibrium, but under the condition that the behavior is in line with the normative portfolio theory.

Normative portfolio theory deals with economic participants making decisions under uncertainty. If an investor knew for certain what his future returns on securities will be, he would only be interested in maximizing the expected returns on his portfolio. In that

case he could easily determine its structure: he would choose the security yielding the highest return. Markowitz, however, concluded that the portfolio selection focusing only on maximizing the expected rate of return would be inferior, because then the investor would not opt for portfolio diversification given that, under full certainty, it would not achieve anything significant. Nevertheless, in reality, diversification is, as we already know, a rational investment strategy, mitigating the always present investment uncertainty. Uncertainty is, thus, crucial for the analysis of rational investment behavior. Therefore, portfolio theory starts from the assumption that investors are interested both in returns and in risks of their portfolios, i.e. that there is always the condition of uncertainty.

Achievements of normative portfolio theory can be used in practice, provided that one owns sufficient computer capacities and required databases. Thus, it is possible to detect, from the aspect of mean value and variance, efficient portfolio combinations for a large number of different securities. Markowitz has shown that the expected rate of return on a portfolio is a simply weighted arithmetic mean of the expected rates of return on the securities it contains.

Markowitz believes that for most real-life situations from the financial market a properly constituted portfolio enables risk mitigation without any losses in respect of expected rates of return. Based on this, he enabled the identification of specific combinations of securities which, at a given level of risk, maximize the rate of return. Such portfolios are called efficient by Markowitz, whereas a group of such portfolios is referred to as an efficient frontier and an efficient set or group.

Positive portfolio theory examines the position of market equilibrium provided that investors behave according to the normative portfolio theory. It can also be referred to as a market equilibrium theory under the conditions of uncertainty or as a capital market theory. It indicates how, under certain conditions, assets should be valued on the capital market. In the basis of positive portfolio theory is the so-called Capital Asset Pricing Model, developed by Sharpe, the third winner of the Nobel Prize in Economic Sciences for 1990.

Selected works

1. Markowitz, H. M. (1952). “Portfolio Selection”. *The Journal of Finance* 7 (1): 77-91.
2. Markowitz, H. M. (1952). “The Utility of Wealth”. *The Journal of Political Economy* (Cowles Foundation Paper 57) LX (2): 151-158.
3. Markowitz, H. M. (1957). “The Elimination Form of the Inverse and Its Application to Linear Programming”. *Management Science* 3 (3): 255-269.
4. Markowitz, H. M. (1959). *Portfolio Selection: Efficient Diversification of Investments*. New York: John Wiley & Sons.
5. Markowitz, H. M. and E. van Dijk (2003). “Single-Period Mean-Variance Analysis in a Changing World”. *Financial Analysts Journal* 59 (2): 30-44.
6. Markowitz, H. M. (2005). “Market Efficiency: A Theoretical Distinction and So What?”. *Financial Analysts Journal* 61 (5): 17-30.