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Nobelova nagrada za 2013.

EFIKASNOST TRŽIŠTA KAPITALA

Rezime

U 2013. godini Nobelovu nagradu iz ekonomije dobili su američki ekonomisti Judžin Fama, Lars Peter Hansen i Robert Šiler. Monetaristi Fama i Hansen sa Univerziteta u Čikagu i neokenzijanac Šiler sa Jejl univerziteta su, kako je saopštila Švedska kraljevska akademija, ovu prestižnu nagradu dobili za istraživanja koja matematičkim i ekonomskim modelima utvrđuju (ne)pravilnosti u razvoju vrednosti akcija na berzama. Fama je sa kolegama šezdesetih godina ustanovio da je kratkoročno izuzetno teško predvideti cene akcija, pošto nove informacije brzo ulaze u cene. Šiler je, međutim, ustanovio da, iako skoro da nije moguće predvideti cene akcija za period od nekoliko dana, to ne važi za period od više godina. Utvrdio je da cene akcija fluktuiraju znatno više nego dividende korporacija i da odnos cena prema dividendama teži da pada kada je visok, a da raste kada je nizak. Taj obrazac ne važi samo za akcije, već i za obveznice i drugi kapital.

Ključne reči: Nobelova nagrada, 2013. godina, ekonomija, Judžin Fama, Lars Peter Hansen, Robert Šiler, monetarista, Univerzitet Čikago, neokenzijanac, Jejl univerzitet, Švedska kraljevska akademija, akcija, berza, investicioni fondovi, korporacija, dividende, obveznice, kapital

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scientific review article

Eugene F. Fama

Nobel Prize for 2013

CAPITAL MARKET EFFICIENCY

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Summary

In 2013 the Nobel Prize in Economic Sciences was awarded to the American economists, Eugene Fama, Lars Peter Hansen and Robert Shiller. The monetarists, Fama and Hansen, from the University of Chicago, and the Neo-Keynesian, Shiller, from the Yale University, according to the Swedish Royal Academy, won this prestigious prize for their research providing mathematical and economic models to determine (ir)regularities in the stock value trends at the stock exchanges. With his colleagues, in the 1960s Fama established that, in the short term, it is extremely difficult to forecast stock prices, given that new information gets embedded in the prices rather quickly. Shiller, however, determined that, although it is almost impossible to predict the stock prices for a period of few days, this is not true for a period of several years. He discovered that the stock prices fluctuate much more substantially than corporation dividents, and that the relationship between prices and dividends tends to decline when high, and to grow when low. This pattern does not apply only to stocks, but also to bonds and other forms of capital.

Keywords: Nobel Prize, 2013, Eugene Fama, Lars Peter Hansen, Robert Shiller, monetarist, University of Chicago, Neo-Keynesian, Yale University, Swedish Royal Academy, stock, stock exchange, investment funds, corporation, dividends, bonds, capital.

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Dovoljan je i letimičan pogled na imena nagrađenih Nobelovom nagradom iz ekonomije da se dođe do zaključka da je, više godina unazad, najčešće dobijaju dvoje ili troje naučnika zajedno. U 2013. godini dobili su je američki ekonomisti Judžin Fama, Lars Peter Hansen i Robert Šiler. Monetaristi Fama i Hansen sa Univertziteta u Čikagu nisu pokazali namere da menjaju svet, već samo da ustanove efikasnost tržišta kapitala (Fama) ili statističkog modela "koliko je variranje cena povezano sa neodlučnošću investitora" (Hansen). Neokenzijanac Šiler je zvezda sa Jejla, pisac dva bestselera, "Životinjske duše" (*Animal Spirits*) i "Iracionalno izobilje" (*Irrational Exuberance*) koji je još 1980. godine otkrio da vrednost akcija raste brže od zarade kompanije.

Kako je saopštila Švedska kraljevska akademija, pomenuti ekonomisti su ovu prestižnu nagradu dobili za istraživanja koja matematičkim i ekonomskim modelima utvrđuju (ne) pravilnosti u razvoju vrednosti akcija na berzama. Fama je sa kolegama šezdesetih godina ustanovio da je kratkoročno izuzetno teško predvideti cene akcija, pošto nove informacije brzo ulaze u cene. Ti nalazi su imali znatan uticaj na istraživanja, ali i na ponašanje na tržištima, pre svega na pojavu takozvanih "indeksnih fondova", odnosno investicionih fondova koji sačinjavaju akcije svih kompanija s berzanskog indeksa.

Šiler je, međutim, ustanovio da iako skoro da nije moguće predvideti cene akcija za period od nekoliko dana, to ne važi za period od više godina. Utvrdio je da cene akcija fluktuiraju, znatno više nego dividende korporacija i da odnos cena prema dividendama teži da pada kada je visok, a da raste kada je nizak. Taj obrazac ne važi samo za akcije, već i za obveznice i drugi kapital.

Hansen je razvio statistički metod koji je posebno pogodan za testiranje teorije u analizi cena, navodi se takođe u obrazloženju Švedske kraljevske akademije nauka. U svojim istraživanjima dokazao je kako je nemoguće u kratkom roku predvideti cene akcija. Hasen je nagrađen zbog svoje statističke metode kojom je testirana njihova teorija, a Šiler je u istraživanje bio uključen jer je još 1980. godine otkrio da vrednost akcija raste brže od zarade kompanija.

Judžin Fama

Judžin Fama rođen je 14. februara 1939. godine u Somervilu, predgrađu Bostona kao pripadnik treće generacije italijanskih doseljenika sa Sicilije u SAD. Kako Fama ističe u svojoj autobiografiji datoj povodom dobijanja Nobelove nagrade, kada je druga generacija njegove velike porodice u Americi stasala za školu, suočila se sa Velikom depresijom, te su bili prisiljeni da se opredele za zanate. Fama je bio prvi predstavnik porodice koji je upisao univerzitet.

Išao je od prvog do osmog razreda u katoličku školu u Menfordu gde su se preselili

Najznačajnije nagrade i priznanja

- 2013 - Nobelova nagrada za ekonomiju
- 1989 - Član Američke akademije nauke i umetnosti
- 2001 - Član Američkog finansijskog udruženja
- 2005 - Nagrada Dojče banke za finansijsku ekonomiju
- 2007 - Morgan Stenli priznanje Američkog finansijskog udruženja za vrhunska dostignuća u finansijama
- 2009 - Onazisova nagrada iz finansija

Even a brief glance at the list of winners of the Nobel Prize in Economic Sciences suffices for a conclusion that for years the Prize has most frequently been shared among two or three scientists. In 2013 it was awarded to the American economists, Eugene Fama, Lars Peter Hansen and Robert Shiller. The monetarists, Fama and Hansen, from the University of Chicago, showed no intention to change the world, but only to determine the capital market efficiency (Fama) or the statistical model "on how the fluctuations of prices are related to investors' indecisiveness" (Hansen). The Neo-Keynesian, Shiller, is a star from the Yale University, the author of two best-sellers, *Animal Spirits* and *Irrational Exuberance*, who back in 1980 discovered that the stock value grows more quickly than the company's profit.

According to the Swedish Royal Academy, the concerned economists won this prestigious prize for their research providing mathematical and economic models to determine (ir) regularities in the stock value trends at the stock exchanges. With his colleagues, in the 1960s Fama established that, in the short term, it is extremely difficult to forecast stock prices, given that new information gets embedded in the prices rather quickly. These findings have had a considerable impact on further research, and on the market behavior, first of all on the occurrence of the so-called "index funds", i.e. investment funds holding shares of all companies from the stock exchange index.

Shiller, however, determined that, although it is almost impossible to predict the stock prices for a period of few days, this is not true for a period of several years. He discovered that the stock prices fluctuate much more substantially than corporation dividends, and that the relationship between prices and dividends tends to decline when high, and to grow when low. This pattern does not apply only to stocks, but also to bonds and other forms of capital.

Hansen developed a statistical model which is particularly convenient for testing the theory in price analysis, as stated in the explanation of the Swedish Royal Academy. In his research he proved that it is impossible to predict the stock prices in the short term. Hansen was rewarded for his statistical method used to test their theory, whereas Schiller got involved in the research when, back in 1980, he discovered that the stock value grows more quickly than the company's profit.

Main Honors and Awards

- 2013 - The Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel
- 1989 - Fellow, American Academy of Arts and Sciences
- 2001 - Fellow of the American Finance Association
- 2005 - Deutsche Bank Prize in Financial Economics
- 2007 - Morgan Stanley American Finance Association Award for Excellence in Finance
- 2009 - Onassis Prize in Finance

Eugene Fama

Eugene Fama was born on 14 February 1939 in Somerville, a suburb of Boston, as a member of the third generation of Italian immigrants from Sicily into the USA. As Fama underlines in his autobiography written on the occasion of winning the Nobel Prize, when the second generation of his big family in America reached maturity, they faced the Great Depression, and were, thus, forced to choose manual jobs. Fama was the first in the lineage to go to university.

He went to a Catholic grammar school in

Judžin F. Fama nakon primanja nagrade
Eugene F. Fama after receiving his Prize

kada su mu roditelji kupili stan i koju su, poput njega, pohađala deca iz radničkih porodica. Iako je u jednom razredu bilo i do šezdeset učenika veliki broj ih je upisao koledž. Fama je potom završio dečačku srednju katoličku školu "Malden katolik" pored Menforda. Univerzitet Tafts upisao je 1956. godine sa željom da postane profesor u srednjoj školi ili sportski trener jer je još u srednjoj školi igrao fudbal, bejzbol i bavio se atletikom. Na kraju druge godine studija oženio je Selien Dimeko koju je zavoleo još u srednjoj školi jer je bila učenica ženske katoličke škole koja se nalazila preko puta katoličke muške koju je Fama pohađao. U braku su dobili četvoro sada već odrasle dece i deset predivnih unučića.

U Taftsu je prvo počeo da uči romanske jezike, ali mu je to uskoro dosadilo, te se tokom poslednje dve godine ozbiljno bacio na ekonomiju. Profesori su bili podjednako inspirativni kao i „istraživačke zvezde" od kojih je kasnije mnogo naučio na Čikago univerzitetu. U poslednjoj godini na Taftsu radio je za Herija Ernsta, profesora ekonomije, koji je vodio agenciju za prognoze na berzanskom tržištu. Fama je imao obavezu da pravi šeme za prognoze na tržištu. Te šeme su uvek funkcionisale na osnovu podataka korišćenih za njihovo dizajniranje. Profesor Heri, kao dobar statističar, tražio je od Fame da se ove šeme umesto toga zasnivaju na "testovima van uzorka". Famine šeme uvek su padale na ovim testovima. U to vreme nije shvatao lekciju, ali mu je kasnije sinulo, tokom rada na efikasnosti tržišta.

Čikago univerzitet je upisao 1960. godine po nagovorima svojih profesora, obradovan što je dobio i stipendiju. Tokom druge godine studija počeo je da posećuje radne grupe koje su se bavile ekonometrijom. U to vreme to je bio centar istraživanja u oblasti finansija u koja su bila uključena poznata svetska imena: Merton Miler, Heri Roberts, Lester Telser, Benoa Mandelbrot, itd. Miler je postao Famin mentor za finansije i ekonomiju i to je, kako ističe, ostao celog njegovog života. Nezaobilazna ličnost u Faminom naučnom radu bio je i statističar Heri Roberts, koji je usadio posebnu filozofiju u Famina empirijska istraživanja, koja je postala zvezda vodilja u njegovoj karijeri. Za razvoj i unapređenje posla

Profesionalna angažovanost

- 1963 - 1965; 1966 - 1968 - Vanredni profesor finansija na Univerzitetu Čikago
- 1968 - 1973 - Profesor finansija na Univerzitetu Čikago
- 1973 - 1984 - Teodor O. Intema profesor finansija na Univerzitetu Čikago
- 1975 - 1976 - Gostujući professor, Katolički Univerzitet Lojven i Evropski institut za napredne studije menadžmenta u Belgiji
- 1982 - 1995 - Gostujući professor, Anderson Fakultet za menadžment, Univerzitet Kalifornije, Los Anđeles
- 1984 - 1993 - Teodor O. Intema izabrani profesor finansija na Fakultetu za poslovne studije, Univerzitet Čikago
- 1993 - Robert R. MekKormik izabrani profesor finansija na Fakultetu za poslovne studije, Univerzitet Čikago

Judžin F. Fama prima nagradu od švedskog kralja Karla XVI Gustava u stokholmskoj Koncertnoj dvorani, 10. decembra 2013.

Eugene F. Fama receiving his Prize from His Majesty King Carl XVI Gustaf of Sweden at the Stockholm Concert Hall, 10 December 2013

Medford (grades 1 through 8), where they moved after his parents purchased a flat. All the children in that school were from working class families like his. Although there were up to 60 children in each class, many eventually went to college. He went on to Boys Catholic High School, also known as Malden Catholic, in a city next to Medford. He entered Tufts University in 1956, intending to become a high school teacher and sports coach, because he used to play football and baseball, and was into athletics. At the end of his second year, he married his high school sweetheart, Sallyann Dimeco, who was a student at Girls Catholic in Malden, just across the street from Boys Catholic which Fama attended. They have four adult children and ten delightful grandchildren.

At Tufts he first started in Romance languages but soon became bored, which is why in his last two years there, he went heavy on economics. The professors were as inspiring as the research stars he later profited from at the University of Chicago. During his last year at Tufts, he worked for Harry Ernst, an economics professor who also ran a stock market forecasting service. Part of his job was to invent schemes to forecast the market. The schemes always worked on the data used to design them. But as a good statistician, Professor Harry insisted on out-of-sample tests. Fama's schemes invariably failed those tests. He did not fully appreciate the lesson in this at the time, but it came to him later, in the evolution of work on market efficiency.

Fama entered the University of Chicago in 1960 after the encouragement from his professors, happy that he had received the scholarship. During his second year at Chicago, he started to attend the Econometrics Workshop. At that time it was the hotbed for research in finance, with the involvement of renowned world economists like Merton Miller, Harry Roberts, Lester Telser, Benoit Mandelbrot, etc. Merton Miller became Fama's mentor in finance and economics, and remained so throughout his lifetime. Another indispensable person in Fama's scientific work was Harry Roberts, a statistician, who instilled a philosophy for

Work Experience

- 1963 - 1965, 1966 - 1968 Associate Professor of Finance, University of Chicago, Graduate School of Business.
- 1968 - 1973 Professor of Finance, University of Chicago, Graduate School of Business.
- 1973 - 1984 Theodore O. Yntema Professor of Finance, University of Chicago, Graduate School of Business.
- 1975 - 1976 Visiting Professor, Catholic University of Leuven and European Institute for Advanced Studies in Management, Belgium.
- 1982 - 1995 Visiting Professor, Anderson Graduate School of Management, University of California, Los Angeles.
- 1984 - 1993 Theodore O. Yntema Distinguished Service Professor of Finance Graduate School of Business, University of Chicago.
- 1993 - Robert R. McCormick Distinguished Service Professor of Finance, Graduate School of Business, University of Chicago

na berzi posebno su bili zaslužni Miler, Roberts, Telser i Mendelbrot.

Drugi važan centar njegovog istraživačkog rada bio je MIT gde je sarađivao sa Sidnijem Aleksanderom, Polom Cutnerom, Frankom Modiljanijem i Polom Semjuelsonom. Franko Modiljani i Merton Miler značajno su doprineli da se MIT i Čikago univerzitet povežu i sarađuju u istraživanjima. Obojica su kasnije dobili Nobelovu nagradu iz ekonomije.

Na kraju druge godine studija na Univerzitetu Čikago Fama je počeo da razmišlja o temi svoje doktorske disertacije. Odabrao je pet tema i otišao kod mentora Milera koji je ravnodušno prešao preko prvih četiri, a petu je prihvatio sa oduševljenjem. Zahvaljujući radu sa Herijem Ernstom na Tafts univerzitetu imao je dnevne podatke za 30 industrijskih akcija Dou Džounz. Predložio je da napravi detaljan dokaz za Mandelbrotovu hipotezu.

Postojali su radovi na tu temu, ali je Fama u svojoj disertaciji branio Mandelbrotovu hipotezu koja je pokazivala da je distribucija povraćaja na berzi ne-normalna i da su akademici koji su se bavili finansijama bili svesni "fat-tailed" fenomena u povraćaju sredstava. Doktorsku disertaciju *Ponašanje tržišnih cena akcija* (*The Behavior of Stock Market Prices*) odbranio je 1964. godine.

Famini radovi, može se reći, počeci su onoga što danas zovemo testovima tržišne efikasnosti. Iako je skovao termine „tržišna efikasnost" i „efikasna tržišta", oni se ne koriste u njegovoj disertaciji. Prvi put se pojavljuju u radu "Slučajan hod cena na berzanskom tržištu" koji je objavljen u časopisu *Finansijski analitičar* 1965. godine.

Samostalno ili u saradnji sa drugim naučnicima Fama je publikovao brojne radove. Na početku svoje naučne karijere, u svojoj doktorskoj disertaciji postavio je tezu: "U suštini još ne postoji opšti model formiranja cena na tržištu hartija od vrednosti koji objašnjava nivo i promenu cena pomoću kretanja temeljnih ekonomskih varijabli". U ovom radu Fama naglašava da je tržište saželo sve relevantne informacije jer kada bi bilo drugačije bilo bi iracionalno, tj. trgovalo bi se po ceni koja zanemaruje neku relevantnu informaciju. S pravom se onda smatra da je teza o efikasnosti tržišta obeležila ceo njegov život.

Zajedno sa Majklom Jensenom objavio je radove koji su danas među najcitiranijima. To su pre svega: "Odvajanje vlasništva i kontrole"

Odabrani radovi

1. "Rizik, prinos i ravnoteža: komentari i pojašnjenja", Judžin F. Fama; *Časopis za finansije*, 1968, 23(1), str. 29-40.
2. "Efikasna tržišta kapitala: Pregled teorije i empirijskog rada", Judžin F. Fama; *Časopis za finansije*, 1970, 25(2), str. 383-417.
3. "Savršena konkurencija i optimalne odluke o proizvodnji u neizvesnim okolnostima", Judžin F. Fama; *Belov časopis za ekonomiju i nauku o menadžmentu*, 1972, 3(2), str. 509-30.
4. "Empirijski odnos dividendi i investicionih odluka firmi", Judžin F. Fama; *Američki ekonomski pregled*, 1974, 64(3), str. 304-18.
5. "Bankarstvo u teoriji finansija", Judžin F. Fama; *Časopis za monetarnu ekonomiju*, 1980, 6(1), str. 39-57.
6. "Prinosi na akcije, očekivani prinosi i realna aktivnost", Judžin F. Fama; *Časopis za finansije*, 1990, 45(4), str. 1089-108.
7. "Ponašanje kamatnih stopa", Judžin F. Fama; *Pregled finansijskih studija*, 2006, 19(2), str. 359-79.

empirical work that was Fama's north star throughout his career. Miller, Roberts, Telser, and Mandelbrot were intensely involved in the burgeoning work on the behavior of stock prices.

The other focal point was MIT, with Sydney Alexander, Paul Cootner, Franco Modigliani, and Paul Samuelson. Franco and Merton provided an open conduit for cross-fertilization of market research at the two universities. Both eventually became Laureates in Economic Sciences.

At the end of his second year at Chicago, Fama started thinking about his doctoral thesis, and he went to Miller with five topics. Merton gently stomped on four of his topics, but was excited by the fifth. From his work for Harry Ernst at Tufts, Fama had daily data on the 30 Dow Jones Industrial Stocks. Therefore, he proposed to produce detailed evidence on Mandelbrot's hypothesis.

Judžin F. Fama i gospođa Selien Fama
Eugene F. Fama and Mrs Sallyann Fama

There was existing work on this topic, but Fama's thesis vindicated Mandelbrot, showing that stock returns conform to non-normal stable distributions and that academics in finance had been aware of the fat tails phenomenon in asset returns. He defended his doctoral thesis titled *The Behavior of Stock Market Prices* in 1964.

Fama's work falls under what came to be called tests of market efficiency. He coined the terms "market efficiency" and "efficient markets", but they do not appear in his thesis. They first appear in "Random Walks in Stock Market Prices", published in the *Financial Analysts Journal* in 1965.

Independently or in cooperation with other scientists, Fama has published numerous papers. At the beginning of his scientific career, in his doctoral dissertation he formulated the following thesis: "In essence, there has still been no general model of forming prices at the securities market that would explain the level and change in prices based on the movements of underlying economic variables." In this paper Fama underlines that the market embeds all relevant pieces of information because otherwise it would be irrational, i.e. the trade would have been performed at a price disregarding some relevant pieces of information. It is, thus, duly considered that the market efficiency hypothesis marked his entire life.

Together with Michael Jensen he published

Selected Works

1. "Risk, Return and Equilibrium: Some Clarifying Comments." Eugene F. Fama; *Journal of Finance*, 1968, *23*(1), pp. 29-40.
2. "Efficient Capital Markets: A Review of Theory and Empirical Work." Eugene F. Fama; *Journal of Finance*, 1970, *25*(2), pp. 383-417.
3. "Perfect Competition and Optimal Production Decisions under Uncertainty." Eugene F. Fama; *The Bell Journal of Economics and Management Science*, 1972, *3*(2), pp. 509-30.
4. "The Empirical Relationships between the Dividend and Investment Decisions of Firms." Eugene F. Fama; *American Economic Review*, 1974, *64*(3), pp. 304-18.
5. "Banking in the Theory of Finance." Eugene F. Fama; *Journal of Monetary Economics*, 1980, *6*(1), pp. 39-57.
6. "Stock Returns, Expected Returns, and Real Activity." Eugene F. Fama; *Journal of Finance*, 1990, *45*(4), pp. 1089-108.
7. "The Behavior of Interest Rates." Eugene F. Fama; *The Review of Financial Studies*, 2006, *19*(2), pp. 359-79.

("Separation of Ownership and Control") i "Problem agenata i pravo na ostatak" ("Agency Problems and Residual Claims") koji su štampani u čikaškom časopisu *Journal of Law and Economics*. Teme ovih radova odnose se na ekonomsku teoriju vlasništva koja je usko povezana sa teorijom tržišta, odnosno teorijom firme. One su od šezdesetih godina prošlog veka intenzivno razmatrane. Fama i Jensen zaključuju da vlasnički oblik firme zavisi od karakteristika tržišta na kojem se posluje, odnosno zavisi od vrsta proizvoda i koliko je u proizvodnji važan finansijski kapital, a koliko intelektualni rad. Ključno pitanje je koliko se rad, odnosno efikasnost rada može nadzirati. Rad na traci se lakše nadzire nego onaj u projektnom birou. Klasična, privatna organizacija firme može se, pre svega, očekivati u tradicionalnoj industriji, gde je ključna komponenta ulaganje u materijalnu i finansijsku imovinu, a rad se može hijerhijski nadzirati. U delatnostima u kojima je ključni intelektualni doprinos, u kome se ne može postići hijerarhijsko upravljanje, najčešće se formiraju kooperativne, partnerske akcionarske firme.

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2. Nobelova nagrada za ekonomiju 2013. Fami, Hansenu i Shilleru, A. Šubić, 14.10.2013., www.banka.hr
3. Eugene Fama, još jedan nobelovac - samoupravljač, Željko Ivanković, www.Banka.hr, 14.11.2013.
4. Three Americans win economics Nobel for analysis of asset prices leading to innovations across bonds, equities and even the housing market, Ryan Gorman and associated press reporter, www.dailymail.co.uk, 14.10.2013.

the papers which are today among the most cited ones, including “Separation of Ownership and Control” and “Agency Problems and Residual Claims”, printed in the Chicago *Journal of Law and Economics*. The topics of these papers refer to the economic theory of ownership, which is closely related to the market theory, and the theory of the firm. They have been under intense examination since the 1960s. Fama and Jensen concluded that the type of the firm’s ownership depends on the characteristics of the operating market, i.e. on the type of product and the importance of financial capital versus intellectual work in the production process. The crucial issue is the extent to which work, i.e. the efficiency of work can be supervised. Work on a conveyor belt is easier to supervise than work in a project bureau. The classic, private organization of a firm can be primarily expected in traditional industries, where the key component is investment in material and

financial property, and the activities can be hierarchically supervised. In the fields with predominant intellectual contribution, where hierarchical management cannot be achieved, it is typical to form cooperative, partner shareholding companies.