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PRIMENJENI TEORETIČARI

*Džejms A. Mirlis i
Vilijem Vikri*

Nobelova nagrada za 1996.

Rezime

Nobelovu nagradu za ekonomiju 1996. godine dobili su Džejms Mirlis (1936, Minigaf, Škotska) i Vilijem Vikri (1914-1996, Viktorija, Kanada) za fundamentalni doprinos ekonomskoj teoriji podsticaja u uslovima asimetrične informisanosti. Smatraju se primenjenim teoretičarima koje zanima ekonomska teorija samo kao sredstvo za bolje razumevanje važnih pitanja u ekonomskoj politici.

Ključne reči: Džejms Mirlis, Škotska, Vilijem Vikri, Kanada, SAD, ekonomska teorija podsticaja, asimetrična informisanost, primenjeni teoretičari, poreski mehanizam, dohodak, osiguravajuće kompanije, ugovorene opcije, aukcijska teorija, aukcijska prodaja, aukcija, otvorene engleske aukcije, otvorene holandske aukcije, zatvorene aukcije, urbana ekonomika, responsivno utvrđivanje cene

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*James A. Mirrlees and
William Vickrey
Nobel Prize for 1996*

Summary

The Nobel Prize in Economics for 1996 was awarded to James A. Mirrlees (1936, Minnigaff, Scotland) and William Vickrey (1914-1996, Victoria, Canada), for their fundamental contribution to the economic theory of incentives under asymmetric information. They have been considered applied theoreticians interested in the economic theory only as a means for better understanding of important issues in the economic policy.

Key words: James Mirrlees, Scotland, William Vickrey, Canada, USA, economic theory of incentives, asymmetric information, applied theoreticians, taxation mechanism, revenue, insurance companies, arranged options, auction theory, auction-based sale, auction, open English auctions, open Dutch auctions, closed auctions, urban economics, responsive pricing

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Školovanje u znaku matematike

Džeims Mirlis rođen je 1936. godine u Minigafu, živopisnom selu jugozapadne Škotske. U detinjstvu se sa roditeljima selio po Škotskoj više puta. U osnovnoj školi zbog naočara nije mogao da bude mnogo aktivan u sportu, pre svega u fudbalu, najvažnijem sportu u ovoj zemlji. Naočari i nežno zdravlje bili su osnovni razlozi njegovom sve većem usmerenju na knjigu. Roditelji su mu bili veoma ambiciozni u nameri da postaknu njegovu želju da bude najbolji u školi. Već sa 14 godina postao je svestan svoje okupiranosti matematikom. Nastavnik matematike davao mu je dodatne časove i svoje univerzitetske knjige iz matematike. Džeims je tada želeo da bude profesor matematike. Po završetku srednje škole sa 16 godina polagao je više predmeta: matematiku, engleski, prirodne nauke, francuski, latinski i istoriju. Potom se mesecima spremao za polaganje ispita na Kembridžu, ali je zbog bolesti i odlaska u bolnicu bio sprečen da na njega izađe.

Fakultet u Edinburgu upisao je 1954. godine. Na ovom fakultetu položio je i master iz matematike i filozofije. Nakon toga odlazi na Trinitu koledž, Kembridž zajedno sa još nekoliko studenata iz Edinburga koji su dobili stipendije. Predavanja su mu bila veoma zanimljiva jer su matematiku predavali najbolju matematičari na svetu. Doktor ekonomije na Kembridžu postaje 1963. godine odbranivši tezu „Optimalna akumulacija u uslovima neizvesnosti“.

Na Kembridžu je upoznao i svoju buduću suprugu Džil koja je tu završavala obuku za nastavnika. Medeni mesec su proveli u Škotskoj gde je i počeo da piše doktorsku disertaciju. Džeims se seća jednog perioda zajedničkog života kada su bili vrlo siromašni i živeli u Masačusetsu u stanu u podrumskom delu kuće. Amartija Sen, poznati svetski ekonomista i nobelovac pomogao mu je da dobije projekat „Indija“

na godinu dana (1962-63.). Nakon siromaštva, osam meseci provedenih u Indiji bili su ispunjeni luksuzom. Iz braka sa Džil, koja je umrla 1993. godine, ima dve ćerke: Katrionu i Fionu.

Gostujući je profesor na Jejlu univerzitetu, Berkliju i MIT univerzitetu. Od 1969. do 1995. bio je profesor ekonomije na Berkliju, a predavao je i na Pakistanskom institutu za razvojnu ekonomiju. Danas je profesor na Kembridžu.

Radost priznanja kratko trajala

Vilijam Vikri je rođen 1914. godine u mestu Viktorija, Kanada. Osnovno i srednje obrazovanje stekao je u Evropi i SAD. Diplomirao je matematiku 1935. godine na Jejlu. Ekonomiju je magistrirao 1937. a doktorirao 1947. godine na univerzitetu Kolumbija u Njujorku. Kao protivnik rata, oružja i sile, nije učestvovao u II svetskom ratu, već je radio i osmišljavao poreske sisteme nasleđstva u Portoriku. Živeo je u Njujorku sa suprugom Sesil Tompson kojom se oženio 1951. godine.

Predavao je ekonomiju širom sveta, na mnogim fakultetima, a bio je i konsultant SAD i UN. Osim toga, Vikri je bio i član Akademije nauka SAD, predsednik Američkog udruženja ekonomista, jedan od osnivača Organizacije za oporezivanje, resurse i ekonomski razvoj i član mnogih drugih profesionalnih i civilnih organizacija.

Vilijam Vikri je umro 11. oktobra 1996. godine, dva dana nakon što je objavljena vest da je postao dobitnik Nobelove nagrade za ekonomiju.

Nagrada kao kruna istraživačkom doprinosu u ekonomiji

Vikrija i Mirlisa smatraju primenjenim teoretičarima koje zanima ekonomska teorija samo kao sredstvo za bolje razumevanje važnih pitanja u ekonomskoj



Džeims Mirlis / James Mirrless

School Years Marked by Mathematics

James Mirrless was born in 1936 in Minnigaff, a picturesque village in the southwest of Scotland. In his childhood, he moved with his parents across Scotland several times. At primary school he acquired glasses, which made it difficult for him to be active in sports, first and foremost in football, the most relevant sport in this country. Glasses and fragile health were the main reasons for his increasing attention to books. His parents were rather ambitious in encouraging his desire to be the best student in the school. It was already at the age of 14 that he became aware of his enthusiasm for mathematics. His mathematics teacher gave him individual tuition during classes and lent him university books in mathematics. At the time, James wanted to become a professor of mathematics. Upon high school graduation, at the age of 16, he passes the exams in several subjects: mathematics, English, science, French, Latin and history. After that, he took months to prepare for the entry exam for Cambridge, but due to a sudden illness and urgent admission to the hospital, he was prevented from actually taking the exam. Therefore, he enrolled at the Edinburgh University in 1954. At this University, he obtained MA in Mathematics and Natural Philosophy. After that, he went to Trinity College, Cambridge, together with some other students from Edinburgh who got the scholarships. He found the lectures extremely interesting, given that they were taught by some of the best mathematicians in the world. He gained his PhD in Economics at Cambridge in 1963, having defended the thesis titled "Optimum Accumulation Under Uncertainty".

It was at Cambridge that he met his future wife Gill, who was just finishing her teacher training there. They spent their honeymoon in Scotland, where he started

to write his doctoral dissertation. James recollects a period of their life together when they were rather poor and lived in a basement in Massachusetts. Then Amartya Sen, another recognized economist and Nobel Prize winner, arranged him the India Project for a year (1962-63). Following their impoverishment, the eight months spent in India felt almost inappropriately luxurious. From his marriage to Gill, who passed away in 1993, he has two daughters: Catriona and Fiona.

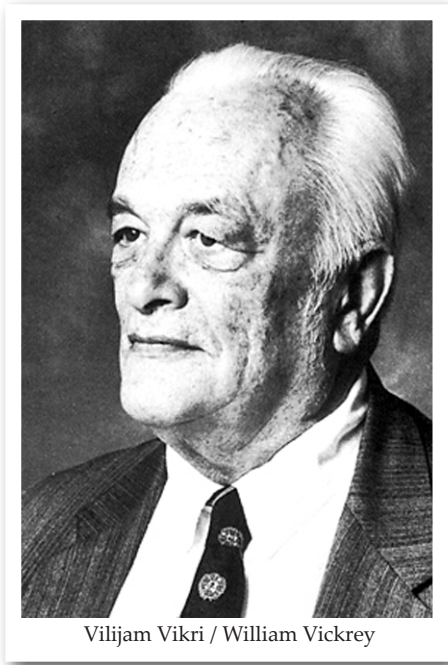
He has been a visiting professor at Yale, Berkeley and MIT University. From 1969 to 1995 he was a professor of economics at Berkeley, and also taught at the Pakistan Institute of Development Economics. Today he teaches at Cambridge.

Joy of Recognition Lasted Briefly

William Vickrey was born in 1914 in Victoria, Canada. He acquired his elementary and secondary education in Europe and the USA. He majored in mathematics in 1935 at the Yale University. He received the MA degree in economics in 1937, and gained the PhD degree in 1947 at the Columbia University in New York. As a conscientious objector during the World War II, he spent part of his alternate service designing a new inheritance tax system for Puerto Rico. He lived in New York with his wife Cecile Thompson whom he had married in 1951.

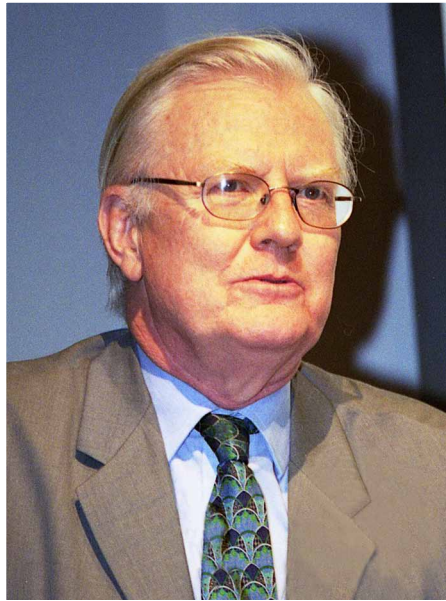
He taught economics all over the world, at numerous universities, and also worked as the consultant for the USA and the UN. In addition, Vickrey was elected member of the National Academy of Sciences, President of the American Economic Association, one of the co-founders of the Taxation, Resources and Economic Development Institute, and the member of many other professional and civic organizations.

William Vickrey died



Vilijam Vikri / William Vickrey

politici. Mirlis se uglavnom obraćao naučnim krugovima, dok je Vikrijev rad prvenstveno bio usmeren na vladine donosiocje odluka. Vikri i Mirlis su postavili temelje teorije asimetrične informisanosti. Mnogi pojmovi koji se danas nalaze u standardnim izvorima definisani su i leksikografski uobličeni mnogo kasnije. Mirlis je ustanovio i objasnio ideje moralnog hazarda, lošeg izbora, samoizbora i mnoge druge. Pokazao je da je moguće kreirati takav poreski mehanizam u kome bi radnici bili sprečeni da “zabušavaju” upravo sistemom podsticaja. Poznato je u bogatoj literaturi o nepotpunoj, nesavršenoj, privatnoj i asimetričnoj informisanosti da se problem moralnog hazarda, kao post-



Džeims Mirlis / James Mirrless

ugovorni fenomen, rešava podsticajima. Mnogo je primera sistema podsticaja, ali je očigledno sve počelo od Mirlisove ideje da je porez svojevrsan podsticaj kojim se može obezbediti funkcionisanje drugog najboljeg rešenja

preraspodele dohotka čime se premošćuje nedostatak informacija o sposobnosti radnika.

U Mirlisovom radu nazire se i model lošeg izbora i njegovog rešenja. Loš izbor je predugovorni fenomen i, pored moralnog hazarda, drugi je način ispoljavanja asimetrične informisanosti. Klasičan primer je poslovanje osiguravajuće kompanije. Ukoliko

ne posedujemo informaciju o nečijoj rizičnosti pre nego što stupimo u ugovorni odnos, tj. osiguramo ga, postoje velike šanse da loše izaberemo i da osiguramo samo visokorizične pojedince. Rešenje ovog problema je davanje više ugovornih opcija i njihovim biranjem pojedinci otkrivaju da li pripadaju rizičnijoj ili manje rizičnoj grupaciji. Ovim samoizborom rešava se problem lošeg izbora. Slično, stvaranjem odgovarajućeg poreskog sistema, radnicima se daju različite opcije (poreski razdeli) i njihovim biranjem tj. biranjem nivoa zalaganja oni nam donekle otkrivaju koliko su sposobni. Vikrijev revolucionarni doprinos aukcijskoj teoriji zasniva se upravo na iznošenju istine, čijim objašnjenjem se zatvara krug celovite ekonomske analize asimetrične informisanosti ove dvojice ekonomista.

Objavljivanjem dva rada 1961. i 1962. godine, Vikri je postavio temelje uporednoj teoriji aukcija, razradivši potpuno novi tip aukcijske prodaje koji je nazvan “Vikrijeva aukcija”. Aukcije zatvorenog tipa (zapečaćene) u kojima svaki učesnik daje samo jednu ponudu, ne znajući kolike su ponude drugih, samo su još jedan primer asimetrične informisanosti učesnika. Aukcioner ne zna koliki maksimalni

Stručni radovi Džejsma Mirlisa / Academic Papers by James Mirrlees

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on October 11th 1996, only two days after the announcement was made that he had won the Nobel Prize in Economics.

Award as the Crown to Research-Based Contribution to Economics

Vickrey and Mirrlees are considered applied theoreticians interested in economic theory only as a means for better understanding of important issues in the economic policy. Mirrlees mostly addressed the academic circles, whereas Vickrey's work was predominantly targeted at the Government's decision-makers. Vickrey and Mirrlees set the foundations of the asymmetric information theory. Many terms used today in some standard reference books were defined and lexically standardized much later. Mirrlees established and explained the ideas of moral hazard, adverse selection, self-selection and many others. He demonstrated that it is possible to create such a taxation mechanism in which the employees would be prevented from "shirking" by means of a system of incentives. The extensive literature on the subject of incomplete, imperfect, private and asymmetric information illustrates that the problem of moral hazard, as a post-contractual phenomenon, is solved by means of incentives. There are many examples of incentives systems, but, evidently, it all started from Mirrlees's idea that taxation might be an incentive in itself, used to ensure the functioning of the second-best solution of revenues distribution, whereby the lack of information on employees' capabilities is being overcome.

Mirrlees's work shows some indication of the adverse selection model and the solution for it. Adverse selection is a pre-contractual phenomenon and, alongside moral hazard, the second mode in which asymmetric information might occur. A classic example would be

the functioning of an insurance company. Unless we own information about the level of risk somebody bears before we enter the concerned contractual relation, i.e. before we provide insurance premium, the chances are

that we might make an adverse selection and insure only high risk bearing individuals. The solution to this problem is to provide several contractual options, the selection of which by the concerned individuals would indicate whether they belong to the higher or lower risk bearing groups. In other words, by allowing self-selection, you solve the problem of adverse selection. Similarly, the formation of the appropriate taxation system generates various options for the employees (taxation bands),



Vilijam Vikri / William Vickrey

Stručni radovi Viliijama Vikrija / Academic Papers by William Vickrey

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iznos su pojedini učesnici aukcije spremni da plate, niti svaki pojedinačni učesnik zna maksimalni iznos ponude ostalih učesnika. Efikasnost nalaže da predmet koji se prodaje na aukciji pripada učesniku sa najvećim iznosom ponude. Osnovno pitanje koje je mučilo Vikrija bilo je: "Kako dizajnirati aukciju u kojoj bi učesnik sa najvišom ponudom ujedno bio učesnik sa najvećim iznosom koji je spreman da plati u odnosu na sve ostale?"

Najbolja strategija je dati ponudu čiji iznos u potpunosti odgovara najvećem iznosu koji je učesnik spreman da plati. Vikri je ovako kreirao mehanizam aukcijske prodaje u kome je u najboljem interesu učesnika da otkriju privatnu informaciju o najvećem iznosu koji su spremni da plate. Ovaj rezultat je pokrenuo teoriju dizajniranja (tržišnih) mehanizama koja je danas na vrlo visokom stepenu razvoja.

Vikri se nije zaustavio samo na ovom modelu aukcija. Mnogo je doprineo uporednoj analizi različitih tipova aukcija: otvorene engleske (rastuća cena gde pobednik plaća cenu kojom je pobedio, tj. najvišu cenu), otvorene holandske (padajuća cena pri čemu pobednik plaća cenu kojom je pobedio), zatvorene aukcije najviše i zatvorene aukcije druge najviše cene. Vikri je pokazao da su engleska i zatvorena aukcija druge najviše cene ekvivalentne. Takođe je

pokazao da su holandska i zatvorena aukcija najviše cene ekvivalentne. Dokazao je da pod određenim uslovima (učesnici neutralni prema riziku) sva četiri tipa aukcija daju identičan rezultat.

Vikri i Mirlis su zadužili ekonomsku nauku besprekornim analizama utvrđivanja cena na nivou graničnih troškova. Vikri se usredsredio na praktičnu primenu (primer predložene izmene tarifnog sistema u njujorškoj podzemnoj železnici), dok se Mirlis usmerio ka pitanjima poreza na promet (Dajmond-Mirlisov model) i analizi troškova i koristi. Termin "nove ekonomike javnog sektora" pripisuje se upravo Mirlisu. On je razrađujući teoriju podsticaja, u uslovima moralnog hazarda, razvio vezu između podsticaja i stava prema riziku. Ustanovio je kada je poznati pristup prvog reda validan: kada je ispunjen uslov monotonog neopadanja odnosa verodostojnosti, kao i kada je funkcija rasporeda konveksna. Ovim nalazima je značajno pojednostavio matematičku analizu drugog najboljeg rešenja koje je jedino moguće u uslovima asimetrične informisanosti. Vikri je poznat i kao veliki autoritet u oblasti urbane ekonomike, kao i izumitelj praktičnih metoda tzv. responsivnog utvrđivanja cena u uslovima promenljive ponude i tražnje u vremenu i prostoru.

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2. The Official Web Site of the Nobel Prize, www.nobelprize.org

and by selecting a certain option, i.e. a certain level of effort, the partly reveal the level of their capabilities. Vickrey's revolutionary contribution to the auction theory is based on the revelation of truth, which closes the circle of the comprehensive economic analysis of asymmetric information conducted by these two economists.

By publishing his two papers in 1961 and 1962, Vickrey set the foundations for the comparative auction theory, by developing a completely new type of auction-based sale, later to be named "Vickrey auction". Closed (sealed-bid) auctions, in which each participant issues just one bid, not knowing the bids of other participants, are just another example of asymmetric information. The auctioneer does not know the maximum amount certain participants are willing to pay, nor does each individual participant know the maximum bid offered by other participants. For the sake of efficiency, the object sold at an auction belongs to the highest bidder. The main question that bothered Vickrey was: "How to orchestrate an auction in which the highest bidder would at the same time be the participant willing to pay the highest amount compared to all other participants?"

The best strategy is to bid the amount which fully corresponds to the highest amount that a participant is willing to pay. This is how Vickrey designed the auction mechanism in which it is in the best interest of participants to reveal private information about the highest amount they are willing to pay. This result launched the theory of designing (market) mechanisms, which is today at the extremely high level of development.

However, Vickrey did not stop at this auction model. He largely contributed the comparative

analysis of many different auction types: open English (increasing price where the winner pays the price which brought him the win, i.e. the highest price), open Dutch (decreasing price where the winner pays the price which brought him the win), first-price closed and second-price closed auction. Vickrey showed that English and second-price closed auctions are equivalent. He also showed that Dutch and first-price closed auctions are equivalent. Moreover, he proved that under certain conditions (risk-neutral participants), all four types of auctions yield the identical result.

The economic science will always be indebted to Vickrey and Mirrlees for their impeccable analyses of pricing at the marginal costs level. Vickrey focused on the practical implementation (for example, the proposed reform of the tariff system in the New York subway), whereas Mirrlees focused on the issues concerning turnover tax (Diamond-Mirrlees model) and cost-benefit analysis. The term "new public economics" is attributed to Mirrlees. By developing his theory of incentives in the conditions of moral hazard, he established the connection between incentives and risk appetite. He determined when the famous first-order approach is valid: when the monotone non-decreasing of reliability is met, and when distribution function is convex. His findings have considerably simplified the mathematical analysis of the second-best solution, which is only possible in the conditions of asymmetric information. Vickrey is also famous for the authority he enjoys in the field of urban economics, and as the originator of the practical methods of the so-called responsive pricing in the conditions of changeable supply and demand.