

**NOBEL PRIZE IN ECONOMICS: RETROSPECTIVE ANALYSIS AND
PREDICTION OF LAUREATES**

**PRÊMIO NOBEL DE ECONOMIA: ANÁLISE RETROSPECTIVA E PREVISÃO
DOS LAUREADOS**

**PREMIO NOBEL DE ECONOMÍA: ANÁLISIS RETROSPECTIVO Y PREDICCIÓN
DE GALARDONADOS**

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Abstract

The purpose of the article is to analyze retrospective data on the laureates of the Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel for the years 1969-2022 and to try to predict three parameters of 2023: the number of scientists who will receive the award; the part of the world in which the place of work of the laureate(s) is located; age of laureate / average age of laureates. During the years 1969–2022, the prize was awarded 54 times, and 92 people became its laureates. 74 awardees are affiliated with North America. The age of most scientists at the time of awarding was from 61 to 70 years. According to the obtained forecast trend models, in 2023 the laureates of the prize will be 3 people, representatives of higher education institutions from North America, whose average age will be in the range of 61–70 years.

Keywords: Nobel Prize, Laureates in economics, Analysis, Prognostication, Retrospective data

Resumo

O objetivo do artigo é analisar dados retrospectivos sobre os laureados do Prêmio Sveriges Riksbank em Ciências Econômicas em Memória de Alfred Nobel para os anos 1969-2022 e tentar prever três parâmetros para 2023: o número de cientistas que receberão o prêmio; a parte do mundo em que o local de trabalho do(s) laureado(s) está localizado; idade do laureado / idade média dos laureados. Durante os anos de 1969 a 2022, o prêmio foi concedido 54 vezes e 92 pessoas foram laureadas. 74 premiados são afiliados à América do Norte. A idade da maioria dos cientistas no momento da premiação era de 61 a 70 anos. De acordo com os modelos de previsão de tendências obtidos, em 2023 os laureados do prêmio serão 3 pessoas, representantes de instituições de ensino superior da América do Norte, cuja idade média estará na faixa de 61 a 70 anos.

Palavras-chave: Prêmio Nobel, Laureados em economia, Análise, Prognóstico, Dados retrospectivos

Resumen

El propósito del artículo es analizar datos retrospectivos sobre los laureados del Premio Sveriges Riksbank de Ciencias Económicas en Memoria de Alfred Nobel para los años 1969-2022 e intentar predecir tres parámetros para 2023: el número de científicos que recibirán el otorgar; la parte del mundo en la que se encuentra el lugar de trabajo del laureado(s); edad del laureado / edad promedio de los laureados. Durante los años 1969-2022, el premio se entregó 54 veces y 92 personas se convirtieron en sus laureados. 74 premiados están afiliados a América del Norte. La edad de la mayoría de los científicos en el momento de la concesión era de 61 a 70 años. De acuerdo con los modelos de tendencia de pronóstico obtenidos, en 2023 los laureados del premio serán 3 personas, representantes de instituciones de educación superior de América del Norte, cuya edad promedio estará en el rango de 61 a 70 años.

Palabras clave: Premio Nobel, Laureados en economía, Análisis, Pronóstico, Datos retrospectivo

1. INTRODUCTION

In 1968, the Swedish Central Bank (Sveriges Riksbank) established a Prize in Economic Sciences in Memory of Alfred Nobel, the founder of the Nobel Prize. The prize is based on a donation received by the Nobel Foundation in 1968 from the Swedish central bank on the occasion of its 300th anniversary. Note that the Prize in Economic Sciences is awarded by the Royal Swedish Academy of Sciences according to the same principles as other Nobel Prizes, which have been awarded since 1901. The Nobel Prize in Economics was awarded for the first time in 1969 (Nobel Prize Outreach, 2022a) Since then, more than 90 people of different ages and genders, representatives of various countries and institutions, researchers of various branches of the economy have become its laureates.

2. LITERATURE REVIEW

Since the Nobel Prize in economics is one of the most famous and prestigious in the world, researchers are very interested in the works of the laureates and other characteristics related to their activities. Moreover, both individuals and their groups are subject to analysis.

In particular, Bhattacharyya and Sahu (2020) analyzed the performance of the publications of Elinor Ostrom, a famous American political economist and the first woman laureate who received the Nobel Prize in economics in 2009. Bjork (2019) determined the average age of Nobel Prize laureates at the time of conducting research on their award. Bjork et al. (2014) analyzed the citation trajectories of Nobel laureates in economics from 1930 to 2005. They described them mathematically using Bass's innovation diffusion model.

Boettke et al. (2012) assessed the impact of two groups of economists: mainline economists who see economics primarily as a science of exchange and mainstream economists who see economics primarily as a science of choice. Chan et al. (2018) to investigate the relationship between early-career performance or recognition and winning the Nobel Prize in economics, compared winners of the John Bates Clarke Medal, the most prestigious award for early-career economists, with other successful scientists.

Chan and Torgler (2012) examined the purely descriptive relationship between Econometric Society membership and winning the Nobel Prize in economics. Charlton (2007)

conducted a scientometric identification of elite research institutions in "revolutionary science" by analyzing trends in Nobel Prizes 1947-2006. Claes and Ceuster (2013) estimated the achievement of Nobel laureates in economics using a simple model that exponentially relates popularity to achievement.

Cortes and Andrade (2022) compared productivity and impact between the Colombian scientific elite and Nobel laureates in science and economics using a stratified random sample from 1990 to 2020 using a composite citation index. Einav and Leat (2006) investigated the influence of surname initials on the professional results of economists in the academic labor market. Garfield (1990) made a prediction of Nobel Prize laureates in economics based on citation rates.

Using the concept of network centrality, Huston and Spencer (2018) created eight measures of economist influence using a traditional article and citation network and a more recent internet link network. These indicators were combined using factor analysis to create a ranking of Nobel Prize winning economists. Korom (2022) proposed a circle of interdependencies: publications in the top 5 journals (American Economic Review, Econometrica, Journal of Political Economy, Quarterly Journal of Economics, and Review of Economic Studies) → work in the top 5 departments (Harvard University, Massachusetts Institute of Technology, Stanford University, Princeton University and University of Chicago) → Nobel Prize.

The aim of the study by Mitsis (2022) is to empirically examine the time gap between groundbreaking work and recognition of the Nobel Prize and to discuss possible explanations for its variation across time and disciplines. Mixon et al. (2017) analyzed the relationship between winning the Nobel Prize in economics and winning the John Bates Clark Medal, namely the length of time between the two awards.

Molina et al. (2021) analyzed the production and networks of Nobel laureates in economics using the normalized impact factor (NIF) of their publications in the Journal of Citation Report (Economics) to identify academic leaders among those laureates who were awarded between 1969 and 2016. Nelson (2005) studied the properties of academic home pages of Nobel laureates.

The purpose of the study by Petřík (2004) was to classify five categories of economic research of Nobel Prize laureates in economics: a) general economic theory; b) theoretical contribution to some aspects and sectors of the economy; c) methodological aspects of economic analysis; d) institutional economy; e) global and interdisciplinary approach.

Prinz (2017) proposed a measure of the relative memorability of Nobel laureates based on an exponential forgetting curve. Sanderson and Siegfried (2019) described the contribution of a sample of laureates to the economy and the social and political world around them; spotlighted some of their contemporaries who were not selected, the directions in which the field of economics and its practices may be headed in the coming years, and thus where future laureates may be found. Shanahan et al. (2012) identified some of the issues discussed by recent Nobel laureates, categorizing their speeches by topic and level of complexity and providing some examples of how their work can be integrated into undergraduate courses. Sirůček, (2021) summarized the more than 50-year history of the Nobel Prize in economics, including the focus of the laureates. Tol (2022) presented the professor-student network of Nobel Prize laureates in economics.

Torgler et al. (2008) turned Snow White's magic mirror on recent Nobel laureates in economics, leading economists and happiness researchers, and through the eyes of the "man on the street" they tried to determine who was the happiest scientist. Walter et al. (2022) investigated the effect of peer collaboration on the production and diffusion of knowledge among the most prominent people in their fields, such as Nobel laureates in economics.

Wu et al. (2011) conducted a case study of the sequence h-indexes of several Nobel laureates in medicine, chemistry, and economics. Zhang et al. (2019) extended a new model called Swangroups' model and tested its applicability to the field of economics. The main feature of this model is that a "black swan" represents an important scientific discovery or contribution that has been awarded a Nobel Prize, while "white swans" are highly cited "black swan" publications.

As you can see, most of the mentioned studies are devoted to the retrospective analysis of information about Nobel Prize laureates in Economics.

3. METHODS

The purpose of this article is to analyze retrospective data on the laureates of the Sveriges Riksbank Prize in Economic Sciences in Memory of Alfred Nobel (hereinafter – the Prize) for the years 1969-2022 and to try to predict three parameters-characteristics of the laureates of 2023. Retrospective data from the official page of the Nobel Prize (Nobel Prize Outreach, 2022b) were used for the analysis.

The following indicators were used for forecasting: the number of scientists who will receive the award; the part of the world in which the place of work of the laureate / places of work of the laureates is located; age of laureate / average age of laureates.

Five trend models were built for each forecast parameter:

exponential:
$$y = a_1 e^{a_0 x}, \quad (1)$$

linear:
$$y = a_1 x + a_0, \quad (2)$$

logarithmic:
$$y = a_1 \ln(x) + a_0, \quad (3)$$

polynomial:
$$y = a_2 x^2 + a_1 x + a_0, \quad (4)$$

power:
$$y = a_1 x^{a_0}, \quad (5)$$

where a_0, a_1, a_2 – constants, x – time.

In the figures in the article, for each parameter, only one of the five models with the highest R^2 approximation reliability value is displayed. Note that R^2 is a number in the range 0–1 that reflects the closeness of the trendline values to the actual data; the closer it is to 1, the more accurately the model describes the actual data. Calculations and diagramming were done using Microsoft Excel.

In this context, it should be noted the research of Author (2004), in which similar parameters were predicted, but using only linear models. The author predicted that in 2004 the Nobel laureates in the field of economics will be two scientists, whose average age will be 66-70 years, at least one of them will be an American. Predictions partially came true: 2 representatives of the USA received the Prize, but their average age was 63 years.

4. RESULTS

4.1. Analysis of statistical data on the laureates of the prize for the years 1969-2022

The analysis of statistical data on the laureates of the Prize will be conducted separately for each decade. In particular, data on the winners of the Prize for the years 1969–1970 are shown in Table 1. It indicates the year of award, gender, affiliation at the time of awarding, years of life, and age at the time of awarding for each laureate.

So, in 1969–1970, 3 male scientists received the Prize: 1 each from Norway, the Netherlands and the USA. All of them represented higher education institutions (hereinafter – HEIs). Their average age in the year of award was 65 years. Note that in 1969, two scientists received the Prize at once.

Table 1

Laureates of the Prize for 1969–1970

Award year	Gender	Laureate	Affiliation at time of award	Years of life		Age as of December 31 of the award year
1969	m	Ragnar Frisch	University of Oslo, Oslo, Norway	1895	1973	74
	m	Jan Tinbergen	The Netherlands School of Economics, Rotterdam, the Netherlands	1903	1994	66
1970	m	Paul A. Samuelson	Massachusetts Institute of Technology (MIT), Cambridge, MA, USA	1915	2009	55

Source: Formed by the author based on data Nobel Prize Outreach (2022b).

Data on the winners of the Prize for the years 1971–1980 are presented in Table 2.

Table 2

Laureates of the Prize for 1971–1980

Award year	Gender	Laureate	Affiliation at time of award	Years of life		Age as of December 31 of the award year
1971	m	Simon Kuznets	Harvard University, Cambridge, MA, USA	1901	1985	70
1972	m	John R. Hicks	All Souls College, Oxford, UK	1904	1989	68
	m	Kenneth J. Arrow	Harvard University, Cambridge, MA, USA	1921	2017	51
1973	m	Wassily Leontief	Harvard University, Cambridge, MA, USA	1906	1999	67
1974	m	Gunnar Myrdal	Sweden	1898	1987	76

	m	Friedrich August von Hayek	Austria	1899	1992	75
1975	m	Leonid Vitaliyevich Kantorovich	Academy of Sciences, Moscow, USSR	1912	1986	63
	m	Tjalling C. Koopmans	Yale University, New Haven, CT, USA	1910	1985	65
1976	m	Milton Friedman	University of Chicago, Chicago, IL, USA	1912	2006	64
1977	m	Bertil Ohlin	Stockholm School of Economics, Stockholm, Sweden	1899	1979	78
	m	James E. Meade	University of Cambridge, Cambridge, UK	1907	1995	70
1978	m	Herbert A. Simon	Carnegie Mellon University, Pittsburgh, PA, USA	1916	2001	62
1979	m	Theodore W. Schultz	University of Chicago, Chicago, IL, USA	1902	1998	77
	m	Sir Arthur Lewis	Princeton University, Princeton, NJ, USA	1915	1991	64
1980	m	Lawrence R. Klein	University of Pennsylvania, Philadelphia, PA, USA	1920	2013	60

Source: Formed by the author based on data **Nobel Prize Outreach** (2022b).

As you can see, in 1971–1980, 15 male persons became laureates of the Prize: 9 from the USA, 2 each from Sweden and the UK, and 1 each from Austria and the USSR. 12 of them worked in HEIs, 1 – in the Academy of Sciences, for another 2 the place of work is not indicated. Their average age in the year of award was 67 years. Note that in the analyzed period, 2 scientists received the award 5 times at the same time.

Data on the winners of the Prize for the years 1981–1990 are shown in Table 3.

Table 3
Laureates of the Prize for 1981–1990

Award year	Gender	Laureate	Affiliation at time of award	Years of life		Age as of December 31 of the award year
1981	m	James Tobin	Yale University, New Haven, CT, USA	1918	2002	63
1982	m	George J. Stigler	University of Chicago, Chicago, IL, USA	1911	1991	71
1983	m	Gerard Debreu	University of California, Berkeley, CA, USA	1921	2004	62
1984	m	Richard Stone	University of Cambridge, Cambridge, UK	1913	1991	71

1985	m	Franco Modigliani	Massachusetts Institute of Technology (MIT), Cambridge, MA, USA	1918	2003	67
1986	m	James M. Buchanan Jr.	Center for Study of Public Choice, Fairfax, VA, USA	1919	2013	67
1987	m	Robert M. Solow	Massachusetts Institute of Technology (MIT), Cambridge, MA, USA	1924		63
1988	m	Maurice Allais	École Nationale Supérieure des Mines de Paris, Paris, France	1911	2010	77
1989	m	Trygve Haavelmo	University of Oslo, Oslo, Norway	1911	1999	78
1990	m	Harry M. Markowitz	City University of New York, New York, NY, USA	1927		63
	m	Merton H. Miller	University of Chicago, Chicago, IL, USA	1923	2000	67
	m	William F. Sharpe	Stanford University, Stanford, CA, USA	1934		56

Source: Formed by the author based on data **Nobel Prize Outreach** (2022b).

So, in 1981–1990, 12 male scientists received the Prize: 9 from the USA, 1 each from the UK, France and Norway. 11 laureates represented HEIs, 1 – a research institute. Their average age in the year of award was also 67. It should be noted that in 1990, the Prize was awarded simultaneously to 3 scientists for the first time.

Data on the laureates of the Prize for the years 1991–2000 are presented in Table 4.

Table 4

Laureates of the Prize for 1991–2000

Award year	Gender	Laureate	Affiliation at time of award	Years of life		Age as of December 31 of the award year
1991	m	Ronald H. Coase	University of Chicago, Chicago, IL, USA	1910	2013	81
1992	m	Gary S. Becker	University of Chicago, Chicago, IL, USA	1930	2014	62
1993	m	Robert W. Fogel	University of Chicago, Chicago, IL, USA	1927	2013	66
	m	Douglass C. North	Washington University, St. Louis, MO, USA	1920	2015	73
1994	m	John C. Harsanyi	University of California, Berkeley, CA, USA	1920	2000	74
	m	John F. Nash Jr.	Princeton University, Princeton, NJ, USA	1928	2015	66
	m	Reinhard Selten	Rheinische Friedrich-Wilhelms-Universität, Bonn, Germany	1930	2016	64

1995	m	Robert E. Lucas Jr.	University of Chicago, Chicago, IL, USA	1937		58
1996	m	James A. Mirrlees	University of Cambridge, Cambridge, UK	1936	2018	60
	m	William Vickrey	Columbia University, New York, NY, USA	1914	1996	82
1997	m	Robert C. Merton	Harvard University, Cambridge, MA, USA	1944		53
	m	Myron S. Scholes	Long Term Capital Management, Greenwich, CT, USA	1941		56
1998	m	Amartya Sen	Trinity College, Cambridge, UK	1933		65
1999	m	Robert A. Mundell	Columbia University, New York, NY, USA	1932	2021	67
2000	m	James J. Heckman	University of Chicago, Chicago, IL, USA	1944		56
	m	Daniel L. McFadden	University of California, Berkeley, CA, USA	1937		63

Source: Formed by the author based on data **Nobel Prize Outreach** (2022b).

As you can see, in 1991–2000, 16 male persons became laureates of the Prize: 13 from the USA, 2 from the UK, and 1 from Germany. 15 of them worked in HEIs, 1 – in an investment fund. Their average age in the year of award was 65 years. It should be noted that in the analyzed period, the award was received 4 times by 2 scientists at the same time, 1 time by 3 people at once.

Data on Prize laureates for 2001–2010 are shown in Table 5.

Table 5
Laureates of the Prize for 2001–2010

Award year	Gender	Laureate	Affiliation at time of award	Years of life		Age as of December 31 of the award year
2001	m	George A. Akerlof	University of California, Berkeley, CA, USA	1940		61
	m	A. Michael Spence	Stanford University, Stanford, CA, USA	1943		58
	m	Joseph E. Stiglitz	Columbia University, New York, NY, USA	1943		58
2002	m	Daniel Kahneman	Princeton University, Princeton, NJ, USA	1934		68
	m	Vernon L. Smith	George Mason University, Fairfax, VA, USA	1927		75
2003	m	Robert F. Engle III	New York University, New York, NY, USA	1942		61
	m	Clive W.J. Granger	University of California, San Diego, CA, USA	1934	2009	69

2004	m	Finn E. Kydland	Carnegie Mellon University, Pittsburgh, PA, USA , University of California, Santa Barbara, CA, USA	1943		61
	m	Edward C. Prescott	Arizona State University, Tempe, AZ, USA , Federal Reserve Bank of Minneapolis, Minneapolis, MN, USA	1940	2022	64
2005	m	Robert J. Aumann	University of Jerusalem, Center for Rationality Hebrew, Jerusalem, Israel	1930		75
	m	Thomas C. Schelling	University of Maryland, Department of Economics and School of Public Policy, College Park, MD, USA	1921	2016	84
2006	m	Edmund S. Phelps	Columbia University, New York, NY, USA	1933		73
2007	m	Leonid Hurwicz	University of Minnesota, Minneapolis, MN, USA	1917	2008	90
	m	Eric S. Maskin	Institute for Advanced Study, Princeton, NJ, USA	1950		57
	m	Roger B. Myerson	University of Chicago, Chicago, IL, USA	1951		56
2008	m	Paul Krugman	Princeton University, Princeton, NJ, USA	1953		55
2009	f	Elinor Ostrom	Indiana University, Bloomington, IN, USA , Arizona State University, Tempe, AZ, USA	1933	2012	76
	m	Oliver E. Williamson	University of California, Berkeley, CA, USA	1932		77
2010	m	Peter A. Diamond	Massachusetts Institute of Technology (MIT), Cambridge, MA, USA	1940		70
	m	Dale T. Mortensen	Northwestern University, Evanston, IL, USA , Aarhus University, Aarhus, Denmark	1939	2014	71
	m	Christopher A. Pissarides	London School of Economics and Political Science, London, UK	1948		62

Source: Formed by the author based on data **Nobel Prize Outreach** (2022b).

So, in 2001–2010, 21 scientists, including 1 woman, received the award: 18 from the USA, 1 each from the UK and Israel, 1 worked simultaneously in the USA and Denmark. 20 laureates represented HEIs, 1 combined work at the university and the Federal Reserve Bank. Their average age in the year of the award was 68 years. Note that in the analyzed period, the award was received 5 times by 2 people at the same time, 3 times by 3 scientists at the same time.

Data on Prize laureates for 2011–2020 are presented in Table 6.

Table 6
Laureates of the Prize for 2011–2020

Award year	Gender	Laureate	Affiliation at time of award	Years of life		Age as of December 31 of the award year
2011	m	Thomas J. Sargent	New York University, New York, NY, USA	1943		68
	m	Christopher A. Sims	Princeton University, Princeton, NJ, USA	1942		69
2012	m	Alvin E. Roth	Harvard University, Cambridge, MA, USA , Harvard Business School, Boston, MA, USA	1951		61
	m	Lloyd S. Shapley	University of California, Los Angeles, CA, USA	1923	2016	89
2013	m	Eugene F. Fama	University of Chicago, Chicago, IL, USA	1939		74
	m	Lars Peter Hansen	University of Chicago, Chicago, IL, USA	1952		61
	m	Robert J. Shiller	Yale University, New Haven, CT, USA	1946		67
2014	m	Jean Tirole	Toulouse School of Economics (TSE), Toulouse, France	1953		61
2015	m	Angus Deaton	Princeton University, Princeton, NJ, USA	1945		70
2016	m	Oliver Hart	Harvard University, Cambridge, MA, USA	1948		68
	m	Bengt Holmström	Massachusetts Institute of Technology (MIT), Cambridge, MA, USA	1949		67
2017	m	Richard H. Thaler	University of Chicago, Chicago, IL, USA	1945		72
2018	m	William D. Nordhaus	Yale University, New Haven, CT, USA	1941		77
	m	Paul M. Romer	NYU Stern School of Business, New York, NY, USA	1955		63
2019	m	Abhijit Banerjee	Massachusetts Institute of Technology (MIT), Cambridge, MA, USA	1961		58
	f	Esther Duflo	Massachusetts Institute of Technology (MIT), Cambridge, MA, USA	1972		47
	m	Michael Kremer	Harvard University, Cambridge, MA, USA	1964		55
2020	m	Paul R. Milgrom	Stanford University, Stanford, CA, USA	1948		72
	m	Robert B. Wilson	Stanford University, Stanford, CA, USA	1937		83

Source: Formed by the author based on data **Nobel Prize Outreach** (2022b).

As you can see, in 2011–2020, 19 people, including one woman, became laureates of the award: 18 from the USA, 1 from France. All of them worked in HEIs. Their average age in the year of award was 67 years. It should be noted that in the analyzed period 5 times the award was received by 2 scientists at the same time, 2 times by 3 persons at once.

Data on the winners of the Prize for 2021-2022 are shown in Table 7.

Table 7
Laureates of the Prize for 2021–2022

Award year	Gender	Laureate	Affiliation at time of award	Years of life		Age as of December 31 of the award year
2021	m	David Card	University of California, Berkeley, CA, USA	1956		65
	m	Joshua D. Angrist	Massachusetts Institute of Technology (MIT), Cambridge, MA, USA	1960		61
	m	Guido W. Imbens	Stanford University, Stanford, CA, USA	1963		58
2022	m	Ben S. Bernanke	The Brookings Institution, Washington, D.C., USA	1953		69
	m	Douglas W. Diamond	University of Chicago, Chicago, IL, USA	1953		69
	m	Philip H. Dybvig	Washington University, St. Louis, MO, USA	1955		67

Source: Formed by the author based on data **Nobel Prize Outreach** (2022b).

So, in 2021–2022, the Prize was awarded to 6 male scientists: all employees of HEIs from the USA. Their average age in the year of award was 65 years. Note that in both years, 3 people received the award at the same time.

It is worth noting that the winners represented the following HEIs and other institutions:

- | | |
|--|---|
| Aarhus University – 1; | Columbia University – 4; |
| Academy of Sciences, Moscow – 1; | École Nationale Supérieur des Mines de Paris – 1; |
| All Souls College – 1; | Federal Reserve Bank of Minneapolis – 1; |
| Arizona State University – 2; | George Mason University – 1; |
| Carnegie Mellon University – 2; | Harvard Business School – 1; |
| Center for Study of Public Choice – 1; | Harvard University – 7; |
| City University of New York – 1; | |

Indiana University – 1;	Institute for Advanced Study – 1;
London School of Economics and Political Science – 1;	Trinity College – 1;
Long Term Capital Management – 1;	University of California, Berkeley – 6;
Massachusetts Institute of Technology – 8;	University of California, Los Angeles – 1;
New York University – 2;	University of California, San Diego – 1;
Northwestern University – 1;	University of California, Santa Barbara – 1;
NYU Stern School of Business – 1;	University of Cambridge – 3;
Princeton University – 6;	University of Chicago – 14;
Rheinische Friedrich-Wilhelms-Universität – 1;	University of Jerusalem – 1;
Stanford University – 5;	University of Maryland – 1;
Stockholm School of Economics – 1;	University of Minnesota – 1;
The Brookings Institution – 1;	University of Oslo – 2;
The Netherlands School of Economics – 1;	University of Pennsylvania – 1;
Toulouse School of Economics – 1;	Washington University – 2;
	Yale University – 4.

4.2. Prediction of statistical parameters regarding the laureates of the for the year 2023

Based on the constructed Tables 1–7, we forecast the following 3 parameters-characteristics for the Prize laureates for 2023:

- the number of scientists who will receive the award;
- the part of the world in which the place of work of the laureate / places of work of the laureates is located;
- laureate’s age / average age of laureates.

To begin with, we will build Table 8, in which we will convert the available statistical data into numerical values:

1) assign code 1 to one laureate, code 2 to two, and code 3 to three. The results will be displayed in columns 3 and 8 of Table 8;

2) assign code 1 to North America, 2 to Europe, and 3 to Asia. If in a certain year there were two or three laureates, among whom was a representative of a European / Asian HEI, then we will indicate the code of Europe / Asia, since there are fewer of their representatives among laureates. The results are displayed in columns 4, 9 of Table 8;

3) assign laureates under the age of 50 with code 1; from 51 to 60 years old – 2; from 61 to 70 – 3; from 71 to 80 – 4; from 81 to 90 – 5. If there were two or three laureates in a certain year, then we calculate their average age, round up to a whole, and assign a code to it. The results are displayed in columns 5 and 10 of Table 8.

Table 8
Parameters for forecasting

Observation no	Year	Parameter 1 (quantity)	Parameter 2 (part of the world)	Parameter 3 (age)	Observation no	Year	Parameter 1 (quantity)	Parameter 2 (part of the world)	Parameter 3 (age)
1	1969	2	2	3	28	1996	2	2	4
2	1970	1	1	2	29	1997	2	1	2
3	1971	1	1	3	30	1998	1	2	3
4	1972	2	2	2	31	1999	1	1	3
5	1973	1	1	3	32	2000	2	1	2
6	1974	2	2	4	33	2001	3	1	2
7	1975	2	2	3	34	2002	2	1	4
8	1976	1	1	3	35	2003	2	1	3
9	1977	2	2	4	36	2004	2	1	3
10	1978	1	1	3	37	2005	2	3	4
11	1979	2	1	4	38	2006	1	1	4
12	1980	1	1	2	39	2007	3	1	3
13	1981	1	1	3	40	2008	1	1	2
14	1982	1	1	4	41	2009	2	1	4
15	1983	1	1	3	42	2010	3	2	3
16	1984	1	2	4	43	2011	2	1	3
17	1985	1	1	3	44	2012	2	1	4
18	1986	1	1	3	45	2013	3	1	3
19	1987	1	1	3	46	2014	1	2	3
20	1988	1	2	4	47	2015	1	1	3
21	1989	1	2	4	48	2016	2	1	3
22	1990	3	1	3	49	2017	1	1	4
23	1991	1	1	5	50	2018	2	1	3
24	1992	1	1	3	51	2019	3	1	2
25	1993	2	1	3	52	2020	2	1	4
26	1994	3	2	3	53	2021	3	1	3
27	1995	1	1	2	54	2022	3	1	3

Source: Formed by the author based on Tables 1–7.

The three predictive models obtained on the basis of Table 8 are shown in Fig. 1–3.

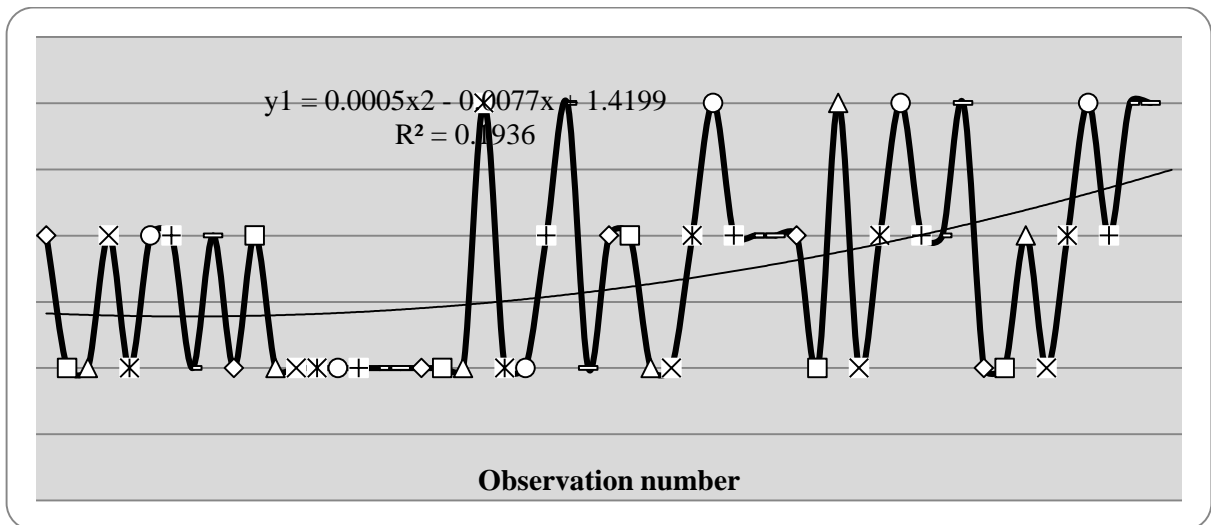


Figure 1. The predictive model for parameter 1 – the number of laureates
Source: Formed by the author based on Table 8.

According to Fig. 1, in 2023 there will be 3 laureates of the Prize ($2.5 \approx 3$).

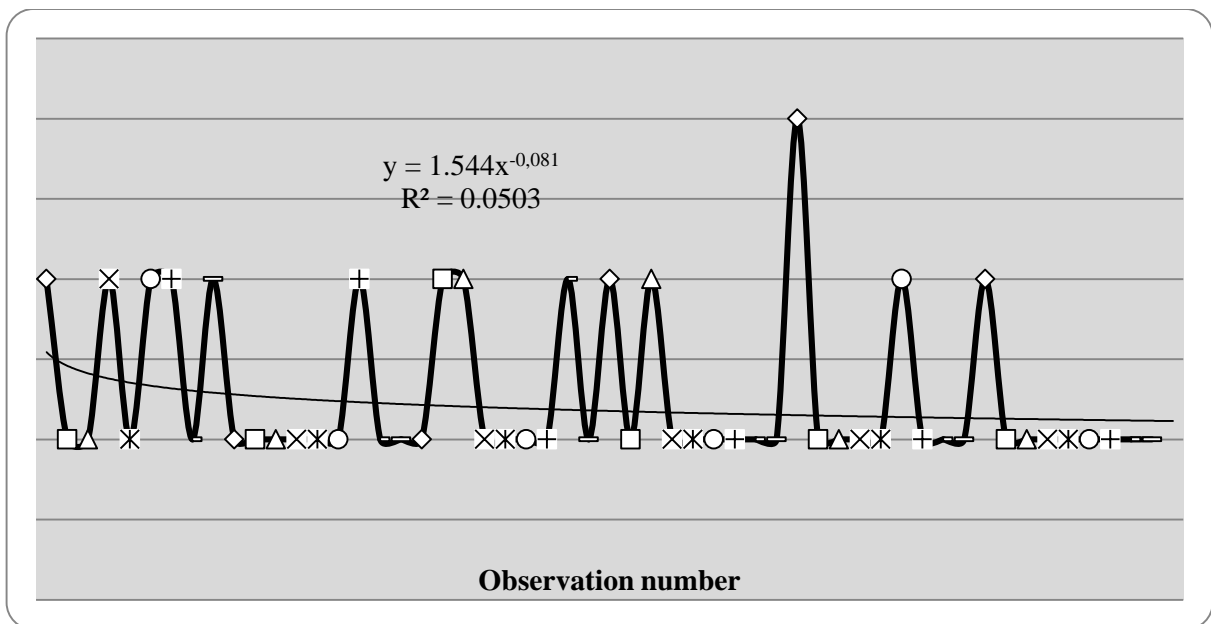


Figure 2. The predictive model for parameter 2 – the part of the world in which the laureates' places of work are located
Source: Formed by the author based on Table 8.

According to Fig. 2, in 2023 the laureates of the Prize will be representatives of HEIs in North America ($1.1 \approx 1$).

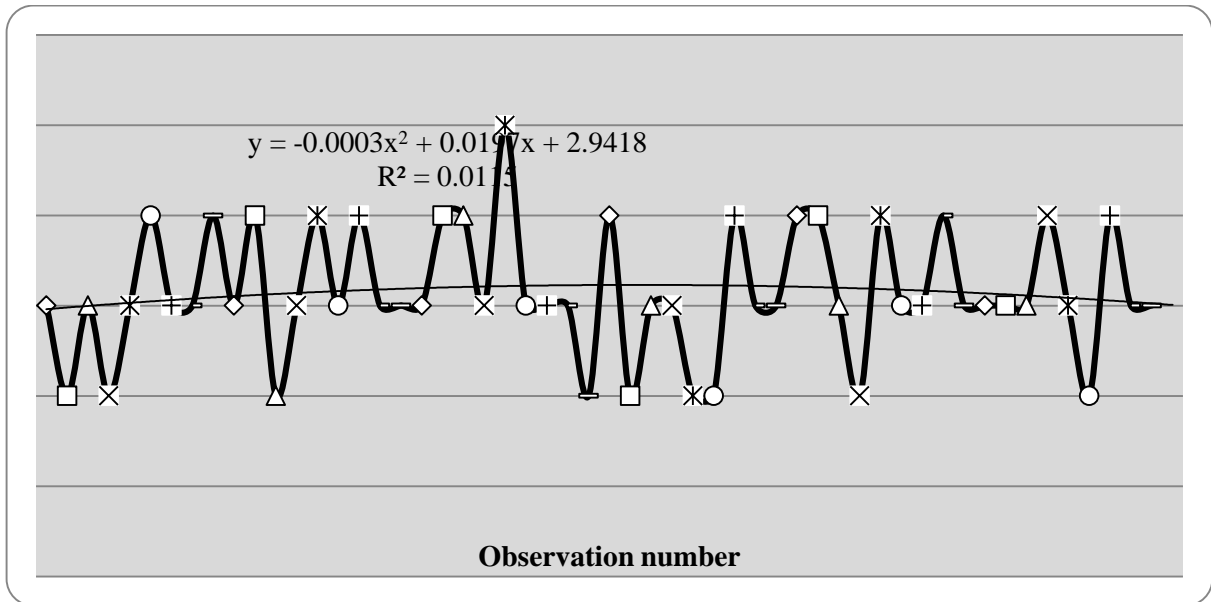


Figure 3. The predictive model for parameter 3 – the average age of the laureates

Source: Formed by the author based on Table 8.

According to Figure 3, in 2023 the average age of the laureates of the Prize will be between 61 and 70 years (3.1≈3).

5. CONCLUSIONS

During the years 1969–2022, the Prize was awarded 54 times, its laureates were 92 people: 90 men and 2 women. 25 times the Prize was awarded to one scientist, 20 times to two persons at the same time, and 9 times to three laureates at the same time. 74 scientists are affiliated with North America (USA), 16 with Europe, 1 with Asia, and 1 with North America and Europe. By age, the laureates fell into the following ranges: under 50 years – 1; from 51 to 60 years old – 17; from 61 to 70 – 47; from 71 to 80 – 21; from 81 to 90 – 6. The youngest laureate of the award was Esther Duflo at the age of 46 (at the time of the announcement), the oldest was Leonid Hurvych at the age of 90. Most of the winners worked at the following HEIs: University of Chicago – 14; Massachusetts Institute of Technology – 8; Harvard University – 7; Princeton University – 6; University of California, Berkeley – 6; Stanford University – 5.

According to the obtained forecast models, in 2023 the laureates of the Prize will be 3 people, representatives of higher education institutions from North America, whose average

age will be in the range of 61–70 years. It will be possible to check their adequacy in October 2024 after the results are published by the Royal Swedish Academy of Sciences

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