

Contribution of Nobel laureates in development of economic thought

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Abstract

The views of Nobel laureates in economic science belong to different waves of economic thoughts which give the opportunity to become familiar with the controversy developed in the field of economic science and concrete problems that affected the world's economy in each period.

The paper presents a summary of contributions of Nobel laureates in five fields of economic science: in Macroeconomics, Partial and General Equilibrium, Interdisciplinary Research and New methods of Economic Analysis.

The focus is mainly in the contribution of Nobel Prize laureates and the year of Nobel Prize Award from 1969-2007.

Furthermore, the paper presents the institutional distribution of laureates and their classification according to their life cycle creativity.

Keywords: Nobel laureates, the fields of economic science, life cycle creativity, experimental innovators, and conceptual innovators.

1. Introduction

Since 1901 the Nobel Prize has been awarded for achievements in physics, chemistry, physiology or medicine, literature and for peace.

The Prize in Economic Sciences in Memory of Alfred Nobel was created by the Central Bank of Sweden in 1968. Apart from the difference in origin, the Economics Prize is awarded by the same rules and administered in much the same way as the other prizes.

The issues treated by Nobel laureates in economic sciences are different like are their views expressed for the problems of the same field.

Nobel laureates in economic sciences have contributed to solving many problems in the field of socio-economic development of developed countries and third world countries, in the field of economic development of countries in transition and

their transition to market economy, in the field of technological progress, inflation, efficient use of human and material resources, development of information system, employment and other fields.

Since many of Nobel laureates have contributed to more than one field or scientific problem, it is not easy to make a final classification of Nobel Prize laureates in specific fields of economic science, therefore, different authors have attempted to classify them according to scientific fields and depending where their major contribution was felt and reflected.

Macroeconomics	Partial and General Equilibrium Theory	Microeconomics	Interdisciplinary Research	New methods of Economic Analysis
Friedman, 1976 Meade, 1977 Ohlin, 1977 Lewis, 1979 Schultz, 1979 Klein, 1980 Tobin, 1981 Modiglian, 1985 Solow, 1987 Lucas, 1995 Mundel, 1999 Kydland, 2004 Prescott, 2004 Phelps, 2006	Samuelson, 1970 Hicks, 1972 Arrow, 1972 Debreu, 1983 Allias, 1988	Stigler, 1982 Markowitz, 1990 Miller, 1990 Sharpe, 1990 Mirrlee, 1996 Vickrey, 1996 Merton, 1997 Scholes, 1997 Stiglitz, 2001 Spence, 2001 Akerlof, 2001 Hurwicz, 2007 Maskin, 2007 Myerson, 2007	<u>Political sciences</u> Buchanan, 1986 <u>Sociological sciences</u> Becker, 1992 <u>Law and Organization</u> Simon, 1978 Coase, 1991 <u>Historical sciences</u> Kuznets, 1971 Fogel, 1993 North, 1993 <u>Philosophical sciences</u> Hayek, 1974 Myrdal, 1974 Sen, 1988 <u>Psychological sciences</u> Kahneman, 2002 Smith, 2002	<u>Econometrics</u> Tinbergen, 1969 Frisch, 1969 Haavelmo, 1989 Heckman, 2000 McFadden, 2000 Eangle, 2003 Granger, 2003 <u>The theory of optimal allocation</u> Leontief, 1973 Kantorovich, 1975 Koopmans, 1975 Stone, 1984 <u>Game theory</u> Harsanyi, 1994 Nash, 1994 Selten, 1994 Aumann, 2005 Schelling, 2005

Fig. 1. Classification of Nobel laureates according to their contribution to the field of economic science (1969-2007)

2. Contribution of Nobel laureates according to the field of economic science

Professional researchers think that the most important contributions in the field of economic science awarded with a Nobel Prize (1969 - 2007) belong to the following main fields¹:

- *Macroeconomics*
- *Partial and General Equilibrium Theory*
- *Microeconomics*
- *Interdisciplinary Research*
- *New Methods of Economic Analysis*

Nobel laureates who have contributed to these fields of economic science are as follows:

2.1 Macroeconomics

Most important contributions in the field of macroeconomics have dealt with explanation of the behavior of the national economy as a whole in terms of a number of broad aggregates, such as private consumption, investment, exports, imports, government spending of goods and services, etc. ²

In this field are particularly mentioned contributions of Nobel laureates in economic science as follows:

- *Milton Friedman* awarded with the Nobel Prize (1976) for his achievements in the fields of consumption analysis, monetary history and theory and for his demonstration of the complexity of stabilization policy;
- *Franco Modiglian* (1985) for his pioneering analyses of saving and of financial markets;
- *James Tobin* (1981) for his analysis of financial markets and their relations to expenditure decisions, employment, production and prices;
- *Lawrence Klein* (1980) for the creation of econometric models and their application to the analysis of economic fluctuations and economic policies;
- *Robert Lucas* (1995) for having developed and applied the hypothesis of rational expectations, and thereby having transformed macroeconomic analysis and deepened our understanding of economic policy;
- *James E. Meade and Bertil Ohlin* (1977) for their pathbreaking contribution to the theory of international trade and international capital movements;

¹ Pano A., Angjeli A., "Nobel Lecture", 2003, Tirana, p .5.

² Antioch G., "Brilliant minds: the Nobel Prize in Economics", Economic Roundup, 2006, Australian Government.

- *Robert Mundel* (1999) for his analysis of monetary and fiscal policy under different exchange rate regimes and his analysis of optimum currency areas;
- *Robert Sollow* (1987) for his contributions to the theory of economic growth;
- *Arthur Lewis* and *Theodore Schultz* (1979) for their pioneering research into economic development, with particular consideration of the problems of developing countries;
- *Finn E. Kydland* and *Edward C. Prescott* (2004) for their contributions to dynamic macroeconomics: the time consistency of economic policy and the driving forces behind business cycles;
- *Edmund S. Phelps* (2006) for his analysis of intertemporal tradeoffs in macroeconomic policy". Phelps clarified the importance of human capital for the diffusion of new technology and, hence, for economic growth³.

2.2. Partial and General Equilibrium Theory

Contributions in this field have dealt largely with the analytical structures of theoretical economic models, often highlighting the formal similarity of these structures, and clarifying the conditions for consistency, equilibrium, stability and efficiency of the economic system. Often, these contributions also have included important comparative static experiments, i.e., analyses of how equilibrium positions change in response to changes in various exogenous factors (parameters)⁴.

Nobel laureates who have contributed to this field are as follows:

- *Paul A. Samuelson* is the first economist who was awarded with the Nobel Prize (1970) for the scientific work through which he has developed static and dynamic economic theory and actively contributed to raising the level of analysis in economic science;
- *John R. Hicks* and *Keneth J. Arrow* (1972) for their pioneering contributions to general economic equilibrium theory and welfare theory;
- *Gerard Debreu* (1983) for having incorporated new analytical methods into economic theory and for his rigorous reformulation of the theory of general equilibrium;
- *Maurice Allias* (1988) for his pioneering contributions to the theory of markets and efficient utilization of resources⁵.

³ Mustafa I., "Enterprise in contemporary business", 1997, Prishtine, p. 517 and Lindbeck A, "Prize in Economic Sciences in Memory of Alfred Nobel 1969-2000".

⁴ Lindbeck A., "Prize in Economic Sciences in Memory of Alfred Nobel 1969-2000".

⁵ Pano A, Angjeli A., "Nobel Lecture", 2003, Tirana, p. 6
Lindbeck A, "Prize in Economic Sciences in Memory of Alfred Nobel 1969-2000".

It is largely due to the above-mentioned theorists that general equilibrium theory has become the basic approach in theoretical economic analysis.

2.3 Microeconomics

A number of awards have also been given for contributions in microeconomic theory, dealing with decision-making by individual households and firms, and the allocation of resources among different uses and production sectors in the economy.

Obvious examples of this type of award are the Prizes to:

- *George Stigler* (1982) for his seminal studies of industrial structure, functioning of markets and causes and effects of public regulation;
- *James Mirrlees* and *William Vickrey* (1996) for their fundamental contributions to the economic theory of incentives under asymmetric information;
- *Harry Markowitz*, *Merton Miller* and *William Sharpe* (1990) for their pioneering work in the theory of financial economics;
- *Robert C. Merton* and *Myron S. Scholes* (1997) for a new method to determine the value of derivatives;
- *Joseph E. Stiglitz*, *A. Michael Spence* and *George A. Akerlof* (2001) for their analyses of markets with asymmetric information;
- *Leonid Hurwicz*, *Eric S. Maskin*, *Roger B. Myerson* (2007), for having laid the foundations of mechanism design theory⁶.

2.4 Interdisciplinary Research⁷

A major contribution of Nobel laureates in development of economic science is considered the combination of studies of economic phenomena from the theoretical and practical aspects with other sciences, respectively realization of interdisciplinary researches thus producing important complex works.

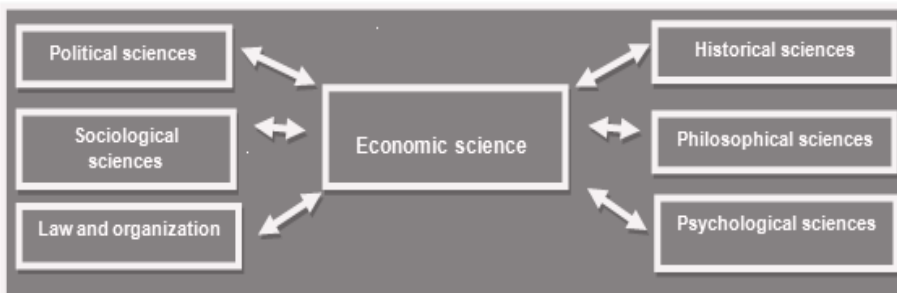


Fig. 2. Combination of research of economic science with other sciences

⁶ Antioch G., "Brilliant minds: the Nobel Prize in Economics", *Economic Roundup*, 2006, Australian Government.

⁷ Pano A, Angjeli A., "Nobel Lecture", 2003, Tirana, p. 8,9;

Mustafa I, "Enterprise in contemporary business", 1997, Prishtine, p. 473 dhe 514.

Lindbeck A, "Prize in Economic Sciences in Memory of Alfred Nobel 1969-2000".

In the field of interdisciplinary research are significantly distinguished the works of Nobel laureates that combine:

Economic science and political science, with valuable results for choosing between different public alternatives. In this type of interdisciplinary research, the Nobel laureate *James McGill Buchanan* has mostly contributed through formulation of the “*Public choice theory*”, called the public choice revolution.

He was awarded with a Prize (1986) for his development of the contractual and constitutional basis for the theory of economic and political decision-making.

Economic science and sociological science, by issuing valuable recommendations about the behavior of companies, families and individuals in terms of their impact into their decision-making with regard to consume, work and a range of other problems of socio-economic life.

In this direction is worth mentioning the contribution of *Gary S. Becker* (1992), for having extended the domain of microeconomic analysis to a wide range of human behavior and interaction, including non-market behavior.

Becker formulated and formalized microeconomic foundations of human capital under the economic approach, thus transforming it into a general theory of determining the distribution of labor incomes through the so called “*Human capital earnings functions*”.

Economic science and law and organization, for the detailed analysis of the decision-making problems dependence by the institutional organism, both of the economy as a whole and its other special units. The greatest assistance in coping with problems of this field was provided by the following Nobel laureates:

- *Herbert A. Simon* (1978), for his pioneering research into the decision-making process within economic organizations. Simon has given e major contribution to development of the “*Theory of the firm*”.
- Among the scientists he is recognized as one of the geniuses of social sciences. He took this epithet based on creation of the Behavioral model of the enterprise.
- *Ronald H. Coase* (1991), for his discovery and clarification of the significance of transaction costs and property rights for the institutional structure and functioning of the economy. By this, he gave a valuable contribution to the development of institutional theory.

Economic science and historical science, helping to better interpretation of economic growth in history, more accurate interpretation of economic history, determination of the dependence of economic development to institutional changes and the role of institutional ownership in the economy. Nobel laureates who have contributed to this field are:

- *Simon Kuznets* (1971), for his empirically founded interpretation of economic growth which has led to new and deepened insight into the economic and social structure and process of development;
- *Robert W. Fogel* and *Douglass C. North* (1993) for having renewed research in economic history by applying economic theory and quantitative methods in order to explain economic and institutional change.

Economic science and philosophical science, for better interpretation and coping with vital problems such as those of welfare, poverty and of developing countries. Nobel laureates that are more mentioned for their contributions in these researches are:

- *Friedrich August von Hayek* and *Gunnar Myrdal* (1974), for their pioneering work in the theory of money and economic fluctuations and for their penetrating analysis of the interdependence of economic, social and institutional phenomena.
- *Amartya Sen* (1998) for his contributions to welfare economics and mainly contribution with Social Choice Theory, contribution to the field of welfare indexes and to the field of welfare of third world countries.

Economic science and psychological science, for studying of economic, political and social phenomena in terms of their impact not only to the economic cycle but to the behavior of individuals and special social groups as producers and consumers.

Interdisciplinary researches that combine psychology and economics are the works of Nobel Prize Laureates of 2002, *Daniel Kahneman*, for having integrated insights from psychological research into economic science, especially concerning human judgment and decision-making under uncertainty and *Vernon L. Smith* for having established laboratory experiments as a tool in empirical economic analysis, especially in the study of alternative market mechanisms.

2.5 New Methods of Economic Analysis

The second half of twentieth century is characterized with the increased role of quantitative methods in studying of economic phenomena, wider use of mathematical and statistical methods, greater development and application of econometrics, use of linear programming as well as creation of a wide range of methods for macroeconomic and microeconomic analysis. In this direction, the laureates that gave a valuable contribution with their works are:

- *Jan Tinbergen* and *Ragnar Frisch* (1969) for having developed and applied dynamic models for the analysis of economic processes. Macroeconomic analytical methods with the influence of Tinbergen are applied in economic planning and economic policy of Netherlands. Tinbergen later developed other econometric models; in particular he formulated the econometric model of USA.

Ragnar Frisch was the first to use the term econometric in his work "Sur un problème de l' économie pure" in 1926. By this, he laid the foundations of econometric, thus developing pioneer activities in the field of mathematic application in economic theory.

- *Tyrgve Haavelmo* (1989) for his clarification of the probability theory foundations of econometrics and his analyses of simultaneous economic structures. He is considered as the main activist of modernization of econometric science, particularly with his studies published between 1943-1944, in the magazine "Econometrica".
- *Robert F. Eangle* (2003) for methods of analyzing economic time series with time-varying volatility and *Clive W.J. Granger* (2003) for methods of analyzing economic time series with common trends (co-integration)⁸.

Great impact in deepening the research of socio-economic phenomena has new methods of human behavior analysis or creation of what is called Microeconometrics. The laureates that are more mentioned with regard to these methods are *James Heckman* for his development of theory and methods for analyzing selective samples, and *Daniel L. Mc Fadden* (2000) for his development of theory and methods for analyzing discrete choice.

The laureates awarded for contributions to creation and use of the method of empirical analysis for the effectiveness of resource deployment, both within national economy and economic units, are:

- *Leonid Vitaliyevich Kantorovich* and *Tjalling C. Koopmans* (1975), for their contributions to the theory of optimum allocation of resources.
- *Richard Stone* (1984) for having made fundamental contributions to the development of systems of national accounts and hence greatly improved the basis for empirical economic analysis;
- *Wassily Leontief* (1973) for the development of the input-output method and for its application to important economic problems. His input-output analysis was applied in the five-year plan of the USA, thus reducing labor and capital costs in terms of unemployment and under conditions of existence of the business cycle.

An important place in creation and use of new methods in socio-economic researches of recent decades belongs to the game theory respectively:

- *John C. Harsanyi*, *John F. Nash Jr.* and *Reinhard Selten* (1994) for their pioneering analysis of equilibria in the theory of non-cooperative games;

⁸ *Lucas R*, "Monetary Neutrality", *Nobel lecture*, 7 December 1995.
Mustafa I, "Enterprise in contemporary business", 1997, Prishtina, p..475;
Pano A, *Angjeli A.*, "Nobel Lecture", 2003,Tirana, p. 459.

- *Robert J. Aumann and Thomas C. Schelling* (2005) for having enhanced our understanding of conflict and cooperation through game-theory analysis⁹.

It is worth mentioning that at the time when Nobel laureates received their prizes, 45 laureates (76 per cent) were working at a US institution. Another striking feature is how strongly the University of Chicago features in the institutional pecking order, with its tally of nine laureates (15 per cent of the total)¹⁰.

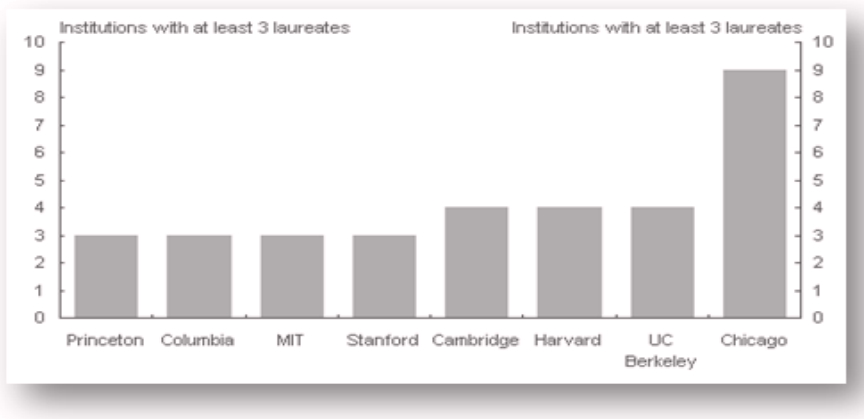


Fig. 3. Institutional distribution of laureates¹¹

The eight institutions showed in the figure 3 account for a little over half of the awards.

3. Life cycle creativity among Nobel laureate economists

Recent research on the careers of nobelists has revealed that there have been two types of innovator:

- Experimental innovators and
- Conceptual innovators

Experimental innovators work inductively. Their innovations derive from knowledge accumulated with experience and their work relies on direct inference from facts.

Conceptual innovators pose precise problems, and solve them deductively. Their innovations derive primarily from *a priori* logic and are often direct responses to existing work. The most abstract and mathematical theorists tend to be the most conceptual.

⁹ Mustafa I, "Enterprise in contemporary business", 1997, Pristine, p..475;

Pano A, Angjeli A., "Nobel Lectures", 2003,Tirana, p. 459.

¹⁰ Period 1968-2005, Antioch G., "Brilliant minds: the Nobel Prize in Economics", Economic Roundup, 2006

¹¹ Source: Antioch G., "Brilliant minds: the Nobel Prize in Economics", 2006, p. 3.

The approach of classifying the laureates into conceptual and experimental is not qualitative but quantitative. However, it happens that some of the moderate conceptual laureates are classified in the extremely conceptual or experimental group. The moderate conceptual group may also include the Nobel laureates that show the similar life cycles as experimental laureates.

CONCEPTUAL			EXPERIMENTAL
Extreme conceptual	Moderate conceptual		
Arrow	Buchanan	Miller	Fogel
Debreu	Coase	Modigliani	Kuznets
Frisch	Friedman	Ohlin	Myrdal
Haavelmo	Hayek	Simon	North
Harsanyi	Klein	Stigler	Schultz
Hicks	Leontief	Stone	
Samuelson	Lewis	Tinbergen	
Solow	Markowitz	Tobin	
	Meade	Vickrey	

Fig. 4. Classification of Nobel laureates according to their life cycle creativity

The extreme conceptual laureates peak on average at age of 42.6 while the moderate conceptualists peak on average at age 47.9. The experimental laureates reach their most important years of their carrier later at the age of 60.6.¹²

4. Conclusion

In general, the authors awarded in the field of economic science are those whose works are noted for their applicative character and not for general theorizations. Their works have made a valuable contribution to the development of economic thought.

The awards reflect some characteristic features of economic analysis during the period 1969-2007:

- important role of macroeconomics (in particular, Friedman, Tobin, Modigliani, Solow, Lucas, Kydland and Prescott, and Phelps)

¹² Weinberg B & Galenson D, "Creative Careers: The Life Cycles of Nobel Laureates in Economics", 2005, NBER, Working paper.

- important role of microeconomics, (in particular, Stigler, Stiglitz, Akerlof and Spencer- economics of information)
- important role of economics of human capital (in particular, Becker, Schultz and Heckman) and economic institutions (in particular, North and Fogel) as well as the role of other interdisciplinary researches.
- growing importance of econometrics (Frisch, Tinbergen, Leontief, Heckman, McFadden, Engle, Granger) and game theory (Nash, Aumann, and Schelling) and the other new methods of Economic Analysis.
- growing importance of Microeconometrics (Heckman and Mc Fadden);
- the emphasis on deductive methods (conceptual innovators) rather than inductive methods (experimental innovators) in economic analysis.

The awards also reflect the dominant role of the United States in economic research during this period.

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