



AUREL IANCU ON HIS 80TH BIRTHDAY

1. He was born on the 17th of December, 1928 in Răcoasa, District of Vrancea. His parents (Gheorghe Iancu, father, and Anica Iancu, mother) were petty farmers. He had four sisters and one brother. He married Elena, a designer, in 1951. They have one daughter, Rodica, and one son, Gheorghe-Mihai, Ph.D. in Mathematics.

He graduated from the Commercial High School of Focșani in 1948. Then he graduated from the Faculty of Economic Sciences of the Academy of Economic Studies of Bucharest in 1952 and earned a Ph.D. degree in Economics in 1972. From 1953 to 1959, Aurel Iancu worked as a senior economist at the Ministry of Heavy Industry, and in 1960 he joined the Institute for Economic Research of the Romanian Academy, working as senior researcher, head of department, scientific director, project manager. Since 1991 he has been a coordinator of doctoral theses at the National Institute for Economic Research of the Romanian Academy.

In the academic year 1970/1971, Aurel Iancu won a scholarship in the USA within the International Researcher Exchange (IREX) Programme. As a visiting scholar, Aurel Iancu engaged in research on models of economic growth at the Massachusetts Institute of Technology (Department of Economics), coordinated by E. Domar, as well as Harvard University and California University-Berkeley. On this occasion, Aurel Iancu participated in seminars conducted by W. Leontief, Paul Samuelson, Robert Solow, Kenneth Arrow, winners of the Nobel Prize in Economics, and lectures delivered by Gerard Debreu (winner of the Nobel Prize in Economics), Gregory Grossman *et al.* In the years that followed, Aurel Iancu made study visits, within international documentation and scientific exchange programmes, to economic research institutes in Moscow, Budapest, Prague, and participated in international scientific conferences and meetings in Italy, France and Bulgaria concerning mathematical applications to economics, international economic relations, natural resources and economic growth.

In 1993 he was elected corresponding member and in 2001 full member of the Romanian Academy.

He is member of several professional associations: the International Society of Natural Resources, the International Society for Intercommunication of New Ideas, and founding member of the Romanian General Association of Economists and the Romanian Society of Economists.

2. In almost 50 years of economic research, Aurel Iancu has published 250 scientific studies, of which 19 books (12 alone and 7 in cooperation or coordinated) and coordinated the Romanian version of 7 volumes and 10 books of Nicholas Georgescu-Roegen's "Complete Works".

His research work and studies cover various fields: economic efficiency and growth, industry structure and resource consumption, international trade relations and European economic integration, theory of economic policy and institutional transformation, economic epistemology.

a) *Using scientific methods in research.* To ensure the research consistency and to confirm the hypotheses, Aurel Iancu has used adequate scientific methods, so that the results or the conclusions should explain the processes and reveal or anticipate the trend of the processes studied. He was one of the promoters of using mathematics in economics in Romania. The computation and analysis techniques provided by matrix algebra, mathematical programming, differential equations, optimal principle, regression equations and econometric analysis were used to describe and analyse various economic processes in relation to supply and demand, consumption, production structure and factor substitution, the process involving the consumption of resources due to changes in the branch structure and final consumption structure, price formation, accumulation optimisation, economic convergence, etc.

While in his early research work the methods were mainly quantitative, then he has gradually laid the stress on qualitative aspects and factors in his economic analyses and predictions. At this stage, Aurel Iancu has considered Georghescu-Roegen's criticism of arithmorphism and economic trends based only on mathematical formalism, without reflecting the real economic phenomena and processes.

To document certain opinions, Aurel Iancu goes through the history of economic theories and ideas (providing a critical evaluation of various opinions) and checks several hypotheses, statements and propositions by means of logical methods, statistical material processed through econometric methods. He has been concerned not to make a great fuss of sophisticated but inconsistent methods and techniques, but to apply methods able to properly describe phenomena and processes, as well as related trends, and to confirm hypotheses and assumptions. For example, the research work concerning the maximum economic efficiency was based on techniques of optimisation including various objective functions and constraints, the research on economic growth and the accumulation-consumption relation implied differential equations and optimal principle, the analyses of the impact of production structure on cumulated power consumptions was based on proper computation techniques implying production routes derived from the input-output analysis. Also, for checking the application of the Heckscher-Ohlin theory (regarding the factor endowment) to the realities of the Romanian economy, he used the matrix calculation (input-output analysis), for analysing the degree of concentration of the population's incomes, as revealed by family budgets, he used Gini coefficients and other statistical instruments, and for studying the trend in the real convergence of non-EU countries and EU countries, he used econometric methods.

The prospective vision and, especially, the multidisciplinary one are two other characteristics of Aurel Iancu's research work. They are documented in volumes 1 and 5 of *The Treatise of Economics (Economic Science and Its Interferences and Fundamentals of the Theory of Economic Policy)* and widely applied to many of his works.

b) *Economic epistemology.* Aurel Iancu is one of the few Romanian researchers who has dealt systematically on a modern basis with issues of economic epistemology. In

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his studies he has focused his attention on the following basic matters: general methodological issues of the economic science; the restructuring of the contemporary economic science under the impact of the new theoretical and methodological knowledge and the confrontation with economic and social realities; the research into domains close to the interface between economic disciplines and other disciplines. In his opinion, the most fertile and vast area of economic research is close to the interface between the field of sciences and the field of logical, experimental and social disciplines. Believing that narrow, strictly specialized approaches to the economic area distort the reality and favours wrong conclusions, Aurel Iancu pays special attention to multidisciplinary and frontier research. Most of his works published for decades are consistent with this type of approach. For example, the careful use of the statistical and mathematical apparatus in almost all his works to describe, analyse and predict the evolution of economic processes ensured the strength of his arguments as well as the accuracy, the depth and the objectivity of his analyses and conclusions, thus avoiding any inconsistency and any risk of coming to an ideological compromise or subjective approaches. Also, dealing with dynamic economic processes (economic development) in close relation to the evolution of the environment condition, the evolution of natural resources (especially the energy resources) as well as with the evolution of social phenomena and processes (population growth, human capital, institutional capital, etc.) helps to expand and deepen knowledge.

While rejecting research based on narrow specialisation, which usually requires unreasonable abstractisation and sterile technicism, on one hand, and dealing with economic issues on a broad basis, using multidisciplinary, on the other hand, Aurel Iancu believes that only this way economic research could properly reflect realities, hypotheses could be tested correctly, and theories could come closer to the truth. The separation of economic processes from social-political and natural processes and from knowledge evolution unavoidably brings about a narrow, misleading and extremely dangerous economism, especially when decisions on economic policy have to be taken. This philosophy, on which Aurel Iancu's work is based, is widely presented in volume 1 of *The Treatise of Economics*, in the study on economic epistemology and in the introduction to *Fundamentals of the Theory of Economic Policy*.

c) *Economic efficiency*. In disagreement with the traditional, engineering-like approach to the question of economic efficiency (only at the level of the investment objective and using as indicators the specific investment, the recovery term or/and the total updated costs), Aurel Iancu adopts, in this respect, Pareto's concept of combination of the production optimum and the consumption optimum. Considering the fundamental concept that there is a close relation between production and consumption through trade, Aurel Iancu uses a diversified system of economic-mathematical models, from the simplest ones (minimisation or maximisation of certain functions) to the most complex ones, which contain objective functions and systems of constraints. These models are built and applied to the individual consumer and the collective consumer, to economic units and branches, as well as to macroeconomy. In this context, he also analyses the question of price formation on the basis of the input-output method and the shadow price method resulted from optimisation models and their economic significance. The results of this research work was presented in his doctoral thesis

“Maximum economic efficiency”, published in 1972 and awarded a Romanian Academy prize, and in articles published in scientific journals.

d) *Economic growth*. This is the field to which Aurel Iancu made the greatest scientific contribution (in amount and in value) in his six books [2, 3, 4, 15, 18, 19] and a large number of articles published and papers presented at national and international conferences. His contribution is obvious in building models of growth by taking into account the labour improved by advanced applied knowledge, the variational calculus and the optimal principle in order to improve the ratio of accumulation to consumption on finite and infinite time horizons. All of them were novelties in the 1970s.

While many economists involved in modelling economic growth were assuming a diminishing return on investment along with a rising development level, Aurel Iancu demonstrated by statistical data in 1976, in *Economic Growth and Natural Resources*, that the return on investment did not permanently diminish along with economic development. In the most developed countries, the return on investment tend to grow because of the effects caused by intangible factors. Once the assumption that the return diminishes is invalidated, also the old formulation of the thesis that national and regional economies generally tend to converge is invalidated, which was extensively illustrated by Aurel Iancu in his articles published in 2006-2007. One should add to them Aurel Iancu’s critical contribution to several theses and comments regarding the growth limitation, brought forward by some builders of global models (e.g. Forrester), as well as the introduction and development – as far back as 1976 – of new concepts such as sustainable development, intangible factors, etc., which have attached weight to economic theory and practice in the last decades.

e) *The economic structure and natural resources*. By the research made in this field, presented in three books [6, 7, 8] and several articles, Aurel Iancu made methodological, conceptual and practical contributions by introducing the concept of direct energy consumption per product and cumulated ones, the analysis of the price formation mechanism in centralized economies and related drawbacks, a methodology for computing direct and cumulated energy consumptions per product, expressed in conventional units (conventional fuel). This research allowed for an insight into the technological and production structure as regards the energy consumption and the real efficiency of production. This is necessary especially for national economies in which a strong intervention of the state or the monopoly domination cause a strong distortion of prices and of efficiency calculations. That is why special calculations are required especially for energy in every form (liquid, solid and gaseous fuel and electric power) as well as a raw material for chemical processes. Defining, computing and interpreting the notion of cumulated energy consumption per product and branch and including it in the analysis of the branch structure of the national economy and in some decisions concerning the economic and energy policies were absolute novelties in economic research and literature of that period, marked by the energy crises, as it was pointed out by the specialized press as well as by several remarkable economists, such as Prof. Henri Guitton, Prof. Bornstein during the discussions about the paper “On the Development of the Energy System and Energy”, presented by Aurel Iancu at the International Conference on East-West Relations in the Energy Field, Milano, 1980.

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f) *The transformation of the economic system.* The transition of Romania and other Eastern European countries to market economy changed the research agenda of the economists from these countries. As Aurel Iancu stresses in his studies published since 1990 [29, 31-37], the first requirement for the transition to market economy was the institutional transformation consisting in adopting and applying new juridical regulations, changing the property structure and the role of the state in the economy, changing the mentalities and responsibilities of the economic actors and ensuring proper conditions for the functioning of the new institutions. In his analyses of the institutional structure in relation to the real economy [31-41], Aurel Iancu points out that during the deep institutional changes in Romania, several institutional hiatuses and uncorrelations occurred, the state authority weakened, etc., which caused a strong crisis in the real economy, reflected in a dramatic production diminution, accompanied by a strong inflation. The transition to market economy means implementing a new institutional structure, correlated and consistent with the need for a competitive market, able to stimulate and promote the most active factors for economic recovery and development. Considering the political pluralism established in the Eastern European countries, consensus is the only way to create a functional and effective institutional system [12].

g) *The theory of economic policy.* To avoid, to a possible extent, chaotic and volitive actions of the political side in the economy, it is highly necessary to formulate and develop a theory of comprehensive and properly structured economic policy in a permanent confrontation with practice, especially when we assume that the political element has specific objectives and is extremely active in a period of transformations. In his books *Bazele teoriei politicii economice (Fundamentals of the theory of economic policy)* and *Politică și economie. Repere ale unui sistem performant (Politics and economics. Benchmarks of an efficient system)* and many articles, Aurel Iancu brings forward a theory able to explain the basic relations between politics and economics and provides the conceptual and methodological framework as well as a system of analytical tools for clearly defining the objectives and selecting and coordinating the economic policy actions. Moreover, the theory of economic policy and the studies on the transformation of the institutional system have provided the framework of concepts and tools for working out strategies for the EU integration and economic development.

h) *International economic relations and the European integration.* In several studies [5, 13, 14, 15, 16, 23, 25, 54-57], Aurel Iancu makes a critical analysis of Ricardo's theory of comparative advantage and Heckscher-Ohlin theory of factor endowment. He points out that for less developed economies, with production and trade structures determined by structures of the classical resources (low-skilled labour, physical capital and natural resources), such theories seem to be rational. But he poses the following important questions: whether such theories are valid for developed and dynamic economies and whether the conclusions to these theories could be accepted by less developed countries for drawing up programmes and formulating policies for development and modernisation.

Considering the progress made in economic research, using statistical data and applying Leontief's, Vernon's and Porter's models to Romania and other countries, Aurel Iancu demonstrates the following: 1) Since the production and trade structures of the developed countries are decisively determined by the presence of human

capital and technological progress to a great extent, the two theories are not valid for these countries; 2) Due to the presence of these factors and the openness of economies, the two theories were replaced with the theory of competitive advantage [13, 56]; 3) Today, due to the intense flow of knowledge, the transfer of technology as well as the flow of direct investments between countries, the production and trade structures change in many countries and, consequently, the competitive advantage emerges.

As regards Romania's integration into the European Union, Aurel Iancu dealt with this process in two ways: 1) Preparing studies on the liberalisation of the goods and services trade, the integration of research and development (R&D), the integration of industry, the real integration, the institutional integration and the nominal integration; 2) Coordinating a multiannual fundamental research programme of the Romanian Academy (2001-2005) for Romania's accession to the EU and coordinating a project for "Economic convergence and the role of knowledge in the context of EU integration" (2006-2008) within the Programme of Excellence. The studies conducted for this purpose were used for taking decisions and drawing up governmental programmes for Romania's development and integration into the EU and published as articles and books [13, 14, 16, 18, 19, 61, 62, 73-78].

3. About 15 graduates took their Ph.D. degree under Aurel Iancu's guidance.

In 1969 he became member of the Scientific Council of the Institute for Economic Research, the Institute of Industrial Economics and the National Institute for Economic Research.

In 2001 he became member of the National Council for Coordination of the Statistics in Romania and in 1994 he became member of the Director and Administration Council of the Elias Foundation of the Romanian Academy. From 1992 to 1995 he was member of the Consulting Group of the Romanian Presidency.

Representative Books and Articles

1. *Eficiența economică maximă. Metode de modelare (Maximum economic efficiency. Modelling methods)*. Editura Politică, 1972, 420 p.
2. *Modele de creștere economică (Economic growth models)*. Editura Politică 1974, 292 p.
3. *Creșterea economică și resursele naturale (Economic growth and natural resources)*. Editura Politică, 1976, 260 p.
4. *Creșterea economică și mediul înconjurător (Economic growth and the environment)*. Editura Politică, 1979, 250 p.
5. *Schimbările economice internaționale (International trade)*. Editura Științifică și Enciclopedică, 1983, 370 p.
6. *Consumul energetic și structura producției (Power consumption and the production structure)*. (co-author and editor), Editura Academiei, 1979, 220 p.
7. *Resursele și structura industriei (Resources and the structure of industry)*. (co-author and editor), Editura Academiei, 1980, 250 p.
8. *Structura economică și sistemul industrial (The economic structure and the industrial system)*. (co-author and editor), Editura Politică, 1986, 315 p.

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9. *Tratat de economie*, vol.1 (*Treatise of economics*). "Știința economică și interferențele ei" ("Economic science and interferences"). Editura Economică, 1993, 302 p.
10. *Tratat de economie*, vol. 3 (*Treatise of economics*). "Piața, concurența, monopol" (Market, competition, monopoly). Editura Expert, 1992, 220 p.
11. *Tratat de economie*, vol. 5 (*Treatise of economics*). "Bazele teoriei politicii economice" ("Fundamentals of the theory of economic policy"), ALL & BECK, 1998, 650 p.
12. *Politică și economie (Politics and economics)*. "Repere ale unui sistem economic performant" ("Benchmarks of an efficient economic system"). Editura Expert, 2000, 300 p.
13. *Liberalizare, integrare și sistemul industrial (Liberalisation, integration and the industrial system)*. (in Romanian and English) Editura Expert, 2002, 200 p.
14. *Dezvoltarea economică a României. Competitivitatea și integrarea în UE*, vol I. (*Romania's economic development. Competitiveness and the integration into the EU*). (co-author and editor), Editura Academiei Române, 2003, 819 p.
15. *Dezvoltarea intensivă și specializarea națiunilor (Intensive development and national specialisation)*. (Selected Works) Editura Economică, 2003, 366p.
16. *Dezvoltarea economică a României. Competitivitatea și integrarea în UE*, vol. II (*Romania's economic development. Competitiveness and the integration into the EU*). (co-author and editor), Editura Academiei Române, 2005, 1012p.
17. *Cunoaștere și inovare. O abordare economică (Knowledge and innovation. An economic approach)*. Editura Academiei Române 2006, 208 p.
18. *Convergența economică*, vol. I, (*Economic convergence*), (co-author and editor), Editura Academiei Române and CHBeck 2008,(in Romanian and English), 200 p.
19. *Convergența economică*, vol. II, (*Economic convergence*), (co-author and editor), Editura Academiei Române and CHBeck, in Romanian and English, (forthcoming), 220 p.
20. "Price Modelling". *Revue Roumaine des Sciences Sociales*, vol 16, No. 2, 1972, 17 p.
21. "Croissance économique environnement et instruments d'harmonisation", *Revue Roumaine des Sciences Sociales*, vol 20, No. 2, 1976, 11 p.
22. "Factor Endowment and Industrial Structure". *Revue Roumaine des Sciences Sociales* vol. 23, No. 1, 1979, 14 p.
23. "On the Development of the Energy System and Energy Conservation". *Revue Roumaine des Sciences Sociales*, vol 25, No. 1-2, 1981, 22 p.
24. "Classical Theory of Comparative Advantage. Merits and Limits". *Revue Roumaine des Sciences Sociales* vol 28, No. 2, 1984, 13 p.
25. "Environment and the Quality of Life". *Revue Roumaine des Sciences Sociales*, vol 29, No. 2, 1985, 10 p.
26. "Income Distribution in Romania : Policies and Programmes". *Revue Roumaine des Sciences Sociales* vol 30, No. 1-2, 1986, 10 p.
27. "Role and Functioning of the Enterprise in Romania". *Revue Roumaine des Sciences Sociales* vol 33, No. 1, 1989, 22 p.
28. "From Command Economy to a Market Economy by Way of Reform or Revolution ?". *Romanian Economic Review*, No. 1-2, 1990,

29. "Nicholas Georgescu-Roegen – A Great Romanian Scholar", *Romanian Economic Review*, vol 38, no. 2, 1994,
30. "The Reform Crisis Transition as an Institutional Change Process", *Romanian Economic Review*, vol 40, No. 1, 1995, 21 p.
31. "The State during Transition Period", *Romanian Economic Review*, vol 40, No. 2, 1995, 15 p.
32. "Trecerea la economia de piață. Căi și obstacole" (The transition to market economy. Ways and obstacles). *Oeconomica*, No. 1, 1991, 5 p.
33. "Liberalism, intervenționism și economia negociată" (Liberalism, interventionism and negotiated economy). *Oeconomica*, vol. 4, 1993, 15 p.
34. "Tranziția ca proces de schimbare instituțională (I)" (Transition as a process of institutional change (I)). *Oeconomica*, vol. 3-4, 1994, 16 p.; vol. 1, 1995, 13 p.; vol. 2, 1995, 23 p.
35. "Neocorporatismul și economia negociată din perspectiva europeană" (Neocorporatism and negotiated economy from a European perspective). *Oeconomica*, vol. 3-4, 1995, 42 p.
36. "Opțiunea pentru sectorul public. Conținutul și structura acestuia" (Opting for the public sector. Content and structure). *Oeconomica*, vol. 2, 1995, 7 p.; vol. 3, 1996, 10 p.
37. "Aplicarea deciziilor publice și problema birocrăției" (Implementing public decision and the question of bureaucracy). *Oeconomica*, vol. 3-4, 20 p.
38. "Cu privire la structura operei roegeniene" (On the structure of Roegen's works). *Academica*, iulie 1996, 10 p.
39. "Opțiuni și priorități decizionale pentru asigurarea unei bune funcționări a activității de cercetare academică" (Options and decision-making priorities for the proper functioning of academic research). *Academica*, Nov.1996, 15 p.
40. "Experiența Suediei în pregătirea aderării în UE" (Sweden's experience in the lead-up to the accession to the EU), *Economistul*, Economie teoretică și aplicată nr. 41, 1996, 28 p.
41. "Relația cercetare - învățămînt în fața noilor provocări" (The research-education relation facing new challenges). *Economistul* 453, Opinia specialistului, 1996, 12 p.
42. "Modelul suedez : economie de piață cu pronunțată orientare socială" (The Swedish Model: Market economy with a pronounced social orientation) (I,II,III,IV), *Tribuna economică*, No. 21,22,23,24, 1990, *Oeconomica*, 1990, 40 p.
43. "Trecerea la economia de piață. Elemente strategice" (The transition to market economy. Strategical elements) (I,II,III), *Tribuna economică* No. 12,13, 14, 1991, 36 p.
44. "Alegerea sectorului public", (Opting for the public sector) I and II, *Oeconomica* No. 2 and 3, 1996, 40 p.
45. "Strategia, coordonarea și stimularea în firmele japoneze" (Strategy, coordination and stimulation in Japanese companies). *Microeconomia aplicată* No. 3, 1997, 6 p.
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48. "Sistemul instituțional și transformarea acestuia" (The institutional system and its transformation). *Oeconomica* No. 2, 1997, 34 p.
49. "Observații fundamentale privind bugetul pe 1998 supuse atenției parlamentului" (Fundamental comments on the 1998 Budget submitted to Parliament). *Oeconomica* No. 1, 1998, 5 p.
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51. "Locul României în diviziunea muncii europene" (Romania's place in the European labour division). *Oeconomica* No. 2, 2000, 8 p.
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53. "Politici industriale alternative, piața și integrarea în Uniunea Europeană" (Alternative industrial policies, the market and the integration into the EU). *Oeconomica* No. 2, 2001, 32 p.
54. "Repere ale Programului prioritar de cercetare al Academiei. Probleme ale integrării României în Uniunea Europeană. Cerințe și evaluări. (ESEN 2)" (Benchmarks of the Priority Programme of the Romanian Academy. Issues concerning Romania's integration into the EU. Requirements and assessments). *Oeconomica* No. 4, 2001, 5 p.
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64. "Finanțarea cercetării și inovării" (Financing research and development). *Oeconomica* No. 1, 2005, 32 p.
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66. "Sistemul de inovare în economia bazată pe cunoaștere" (The innovation system in the knowledge-based economy), in Aurel Iancu (ed), *Dezvoltarea economică și integrarea în UE*, vol II, 2005, 10 p.
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69. "Problema convergenței economice" (Romanian and English) (The question of economic convergence), *Oeconomica* No. 4, 2006, and *Romanian Journal of Economic Forecasting* no.3/2007, 25p.
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