STATISTICS' CERTANTIES AND DILEMMAS

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Abstract: *Today it is almost a fact that information has become a distinct resource in the modern economy, namely that information has individualized as a distinctive production (output) factor. Innovation, says Drucker, is more likely a social term then a technical one and it derives mostly from a change of options.*

There isn't any doubt that evolved technology it has either the form of computers, of telecommunications, of robots fixed on the factories bridging or of the offices automations, either is biogenetics or bioengineering, it has an incommensurate qualitative importance. Although, for the information economy associated with the globalization processes that for nowadays world is a specific phenomena, the exploitation of information as a distinct resource remains the exception chance of any nation.

Rezumat: *Astăzi este o certitudine faptul că informaţia a devenit o resursă distinctă în cadrul economiei moderne, devenind astfel un factor distinct al procesului de producţie. Inovaţia, precizează Drucker, este un termen mai mult social decât tehnic şi provine, în principal, din schimbarea de opinii.*

Nu prezintă niciun dubiu faptul că tehnologia modernă, sub forma computerelor, tehnologiei telecomunicaţiilor, roboţilor industriali şi noile descoperiri în domeniile biogeneticii şi bioingineriei au avut o importanţă calitativă incomensurabilă. Chiar dacă economia bazată pe informaţie este asociată cu procesul globalizării, care în perioada actuală reprezintă un fenomen specific, exploatarea informaţiei ca o resursă distinctivă rămâne şansa excepţională a oricărei naţiuni.

Keywords: *statistics, demography, Kondratieff's cycle, extrapolation, entropy law*

During human society evolution, men of science have noticed and explained an impressive number of aspects regarding nature sciences and social sciences. Although, some theories / phenomena that were or were not statistically noticed have involved various explanations of their production essence, without reaching a mutual point of view. We recall the following problematic phenomena:

MALTHUS THEORIES

Malthus' work, *An Essay on the Principle of Population, as it Affects*, published for the first time in 1798, generated a wave of contestations / critics against the author, as well as against the basic idea that he sustained. In reality, we can say nowadays that Thomas Mathus was at the most mordant or cynic in some of his interpretations of the individual-nature relation. More than this, relying on the data basis offered by statistics after 1800, we can say that Malthus opinion,

namely the idea of planet population exponential growth, meanwhile the natural resources are and remain limited, wasn't confirmed (we'll encounter another famous paper with a negative conclusion, from a opposite angle at Nicolas Georgescu-Roegen, who sustained until the last moment the basic idea of the entropic process). In essence, it is all about the famous Malthus theory:

-statistical argumentation of the population geometrical growth of a country / globe;

-logical argumentation of the idea of arithmetic progressive growth of the natural resource of a country / globe;

Based on some public opinion rejection tendencies there has been created a legend around the Malthus theory, that outshined his work. In reality, only after 1980, after the conference organized in Paris regarding Malthus work and the publishing of the book "Malthus Reconsidered" by W. Petersen it has been achieved a majority point of view regarding Malthus' ideas validity. First edition of Malthus work from 1798 emphasizes the differences between the two growth rates:

a) geometrical progression population growth:

1, 2, 4, 8, 16, 32, 64, 128, 256, ...

b) arithmetic progressive growth of the subsistence means / natural resource :

1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11 ...

Accordingly to Malthus: "Supposing that the actual population that is a thousand million, the human species will grow like this: 1, 2, 4, 8, 16, 32, 64, 128, 256, and the subsistence means: 1, 2, 3, 4, 5, 6, 7, 8, 9. In two centuries from now the population would be, related to the subsistence means, in proportion of 256 to 9, in three centuries of 4096 to 13 and in two thousand years from now, the difference it is almost incalculable." However, even if Malthus theory hasn't been verified yet for the population growth at the world level, it has been demonstrated extremely suggestively for the situation statistically registered in countries as China or India. For instance, China actual economic growth, accumulated with the population number and demographic growth generate big question marks in many business / financial circles from USA and occidental world. Although Malthus' statistical documentation was extremely modest, the demographic explosion registered in some countries offer sufficient basis on behalf of some of his ideas.

ANALYSIS OF A STATISTICALLY NOTICED PHENOMENON IN THE DIFFERENTIATED EVOLUTION OF SEXES BIRTH RATE

Based on the statistical registrations, essentially emphasized after the first and the second world conflagration on different countries as *major participants* in the conflict, it has been remarked the fact that the common trend of birth rate previous to the conflict, on a series of 10 to 20 years (commonly, total new born, this trend includes regularly 52 to 53 % new born of feminine sex and the

difference of 47 to 48 % new born of masculine sex), registered a modification in the two sexes constitution. The statistical data for Rumania, in the period 1930-1940 and 1946-1956, doesn't reflect a very obvious similar modification, even if our analysis hasn't been sufficiently well-informed. According to the Statistical Yearbook for 1958, the births registered by the medical units after world war two were only partial (from 5-6% of total births to 50-55% at the 1957 year level). This could be the main cause for which the processed statistical data are somehow atypical in comparison with the statistically noticed phenomenon at a national level and previously invoked.

Table1. Rumania population evolution during the 1930-1956 periods

Years	Probable population at July 1st (thousands of habitants)	Proportions of:		
		Born (alive)	Still-born	Natural spore
		at 1000 habitants		
1930	14 141	*34,1*	*19,3*	*14,8*
1931	14 355	*32,9*	*20,5*	*12,4*
1932	14 554	*35,1*	*21,1*	*14,0*
1933	14 730	*31,2*	*18,5*	*12,7*
1934	14 924	*31,4*	*19,9*	*11,5*
1935	15 069	*30,1*	*20,1*	*10,0*
1936	15 256	*31,6*	*19,3*	*12,3*
1937	15 434	*30,5*	*18,9*	*11,6*
1938	15 601	*29,5*	*19,1*	*10,4*
1939	15 751	*28,3*	*18,2*	*10,1*
1940	15 907	*26,0*	*18,9*	*7,1*
1946	15 791	*24,8*	*18,8*	*6,0*
1947	15 849	*23,4*	*22,0*	*1,4*
1948	15 893	*23,9*	*15,6*	*8,3*
1949	16 084	*27,6*	*13,7*	*13,9*
1950	16 311	*26,2*	*12,4*	*13,8*
1951	16 464	*25,1*	*12,8*	*12,3*
1952	16 630	*24,8*	*11,7*	*13,1*
1953	16 847	*23,8*	*11,6*	*12,2*
1954	17 040	*24,8*	*11,5*	*13,3*
1955	17 325	*25,6*	*9,7*	*15,9*
1956	17 579	*24,2*	*9,9*	*14,3*

Source: Statistical Yearbook of R.P.R., Bucharest, 1958, p. 266, Statistical Yearbook of R.P.R., Bucharest 1956, 1960

Still if we analyze the data from table 1, cumulated with the statistical analysis, it results a series of interesting conclusions:

- in the period 1941-1945 there are missing all statistical data, and this puts a question mark over the formulated conclusions;
- the natural population spore suddenly diminished from 10% in 1939 to 7% in 1940 and down to 1,4 % in 1947;

- the new born number of feminine sex was with 2 % bigger than in 1941 and after that this difference grew to 7% in 1948 (the trend composition change for sexes is supposed to have happened in 1944-1947).

STATISTICS IN KONDRATIEFF'S WORKS

The Kondratieff 50 years cycles, still are the most vividly disputed and raise some question marks among the economy researchers. Was Kondratieff right or not? The majority of those who dealt with this question incline to formulate a positive answer, even if as Peter Drucker does, there have been discussed some manifestations in economy that contradict "the Kondratieff wave" or, in other words, there have been atypical manifestations. Actually, this type of cycle has a manifestation in time of approximately 45-60 years and it was studied for the first time by Van Gelderen, who identified in 1913 *a long wave* o about 50-60 years, so:

- the output, prices and economic activity in general have substantially grew in 1850-1873 period;
- after 1873, the economy registers a recession and reaches the lowest level in 1890, for the main sectors of activity.

We don't know if Nicolai Kondratieff has red or not Van Gelderens' papers. In the '20es, N. D. Kondratieff works at the Economical Research Institute and Agricultural Academy in the former URSS. He was designated to study and to demonstrate the capitalist economies recession – according to the communistic view of the moment. The result of Kondratieff research was published for the first time outside the URSS in German (*Die langen der Wellen des Konjunktur*, 1926), then in Englsih (*The Long Waves in Economic Life*, 1935).

But Kondratieff's research conclusion was in a total opposition with the initially nominated task. So, he concludes that socialistic planning will register a great failure – firstly in agriculture – meanwhile the capitalist countries will suffer a recession of activity in the '30es, *but will register another period of progress and prosperity in the businesses domain*. Later, Kondratieff had at his disposal supplementary statistical data regarding England and France for domains such as trade, agriculture, cotton industry, coal, iron etc. Based on these data he will calculate **three cycles**, each having two components: "… one upward part of the cycle, where predominates prosperity between some recession periods; after which follows a downward part of the cycle with a general decline of the economic activity". N. Kondratieff hasn't finished his woks, as he was successively removed from his jobs and further killed from Stalin's order. But the **three cycles** can be extrapolated until the present, and the correspondence that results from *the real events that took already place in the world economy* and *the ideal variant of Kondratieff waves* becomes thrilling and certifies the extraordinary visionary capacity of the Russian researcher.

It is true that at the moment, into the world economy – and we refer to those countries with the most developed economy – there is a series of new economic sectors and industries that escape to Kondratieff's structure. Mainly, we think about the informatics reform described by Toffler and / or Druckers' entrepreneurial

economy, within which the new sectors and industries that are based on high technologies follow apart from Kondratieff's predictions for the main fact that they couldn't have been anticipated. But for other sectors and industries "… that have fed the long economic expansion after world war two – automobiles, steal, rubber, electrical equipment, common use electronically equipment, telephone, oil" – the results show that these fit perfectly to "Kondratieff's Cycle". For the future of the processing traditional industries, Kondratieff's theory must be accepted as a serious hypothesis, if not as the most plausible of all the explanations we have at our disposal".

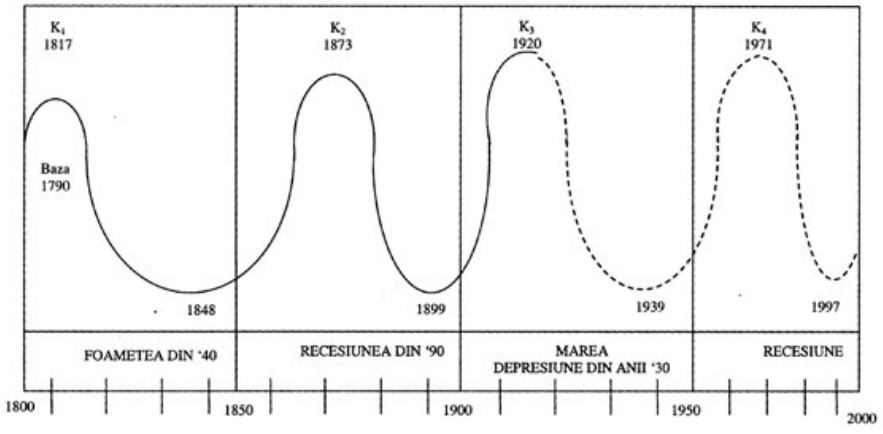
As it results from Houston's paper *Riding the Business Cycle*, as an idealistic variant the Kondratieff's cycles would be represented as in the below figure (the three K_1-K_3 cycles and the fourth K_4 cycle as result of the extrapolation). The extreme points of the four Kondratieff cycles, K_1- K_4 are:

* $\mathbf{K_1}$ = the progress begin from 1789, it reaches the peak in 1814, after which the recession period reaches the lowest level (the base) in 1849;

* $\mathbf{K_2}$ = progression begins in 1849, reaches the top in 1873, and it follows a recession until the 1896;

* $\mathbf{K_3}$ = the cycle begins in1896, it reaches the top in 1920, and the recession phase will continue until 1939;

* $\mathbf{K_4}$ = the progress begins in 1939 and it continues until 1971 when it reaches the top, after that will follow the recession phase from 1971 until 1997, approximately.



*Sursa: William Houston - **Riding the Bussiness Cycle**, Little, Brown & Co., 1995, pag. 165, Copyright © All rights reserved.*

STATISTICS IN NICHOLAS GEORGESCU RONGEN WORKS

The famous American economist of Rumanian origin has definitively related his name to the entropic law and economic process through the paper published in 1971, *The Entropy Law and the Economics Process.* However, Rongen has begun his affirmation as a world wide valuable economist in the statistical studies domain. This way, under Octav Onicescu's influence, he

decided to get his doctoral degree in statistics at Paris and finalized his thesis in mathematic statistics under the title *Research Issues on the Cyclical Components of a Phenomenon*; his paper work was published in 1930 in The Statistic Society Journal in Paris. In essence, throughout his doctoral thesis, Rongen dealt with the problem of finding out a spectral analysis method for discovering the specific cycles of irregular phenomena. Further, he studied at London with Karl Pearson, the father of mathematical statistics, for a period of almost 2 years over the same statistical domain. When he returned to Rumania in 1932, Georgescu Rongen functioned as a statistics professor within the Bucharest University. Rongen published in 1933 the work "Statistical Method. Mathematical Statistics Elements", paper in which he applies in great detail the probabilities calculation and which remained until nowadays extremely present.

Nicholas Georgescu Rongen was attracted by J. Schumpeter and P. Samuelson works achieving further on to develop the well known economic processes entropy law. In parallel with this theory, Rongen achieves to argue extremely pertinently the fact that, for all the living systems, the low energy (the order) tends in an inevitable way to transform itself in high energy (disorder) as in a long period of time it manifests a tendency towards thermal death and chaos of each and every system (the whole energy becomes useless). Rongen says that entropy law ruthless rules upon all the economic processes.

However, as Rongens' somehow negative conclusion towards the humanity evolution on long term didn't registered any sign of confirmation, it can be admitted the hypothesis that on the way of order's transformation into disorder, a process associated to the normal functioning of the economic systems, it accumulates that distinct resource called information / knowledge (a resource without a visibly material content and difficult to statistically quantify).

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