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# SYSTEMS OF INDUSTRIAL INDICATORS – IN A CONTEXT DOMINATED BY THE NATIONAL FORECASTING COMMISSION’S ANTICIPATIONS

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## **Abstract**

*Using conjuncture indicators in projective estimates, together with making best use of the anticipations of the National Forecasting Commission, plays an important role in conducting economic decision-making, facilitating confrontation of a business with its specific cycle, nationally, in keeping with the statistical data of the NSI and Eurostat, thus supporting the entrepreneurs or managers during the economic cycles. After a brief introduction, the paper synthetically presents some systems of statistical indicators in the literature, and later, after a brief methodological section, it focuses on the magic quadrilateral and the pentagon of Romania’s macroeconomic strategy for 2017-2020, leaving room for some brief final remarks.*

**Key words:** *conjuncture, statistical indicator, indicator systems, magic quadrilateral or square, pentagon of economic strategy, perennial hexagon, conjunctural octagon, strategic and tactical decagon of economic competitiveness*

**Jel Codes:** B22, C19, C46, O11.

## **Introduction**

The statistical information system can be regarded as a set of data, information and all the correlations and interactions between them, which allow the analysis of cyclicity of the economy in its phases of transition, crisis, recession or expansion, thus contributing to the determination and materialization of the economic objectives of society. The ways of selecting the statistical financial and accounting indicators range from general criteria to special criteria, from analytic to synthetic, from product to activity, from confrontation to comparison, from pursuing a specific trend or phenomenon, and from ranking or hierarchy to belonging or non-membership in relation to an entity, a geographic region or an economy, to identifying a process or an apparently residual factor, which is however significant over time. Detailed knowledge and in-depth understanding of the business cycle and specific indicators become basic tools in grounding and substantiating managerial

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decision-making. In the context of the informational symmetry of modern market economies, data providers are obliged to provide the producers of official statistics, free of charge, accurate, complete and timely information, to the deadlines, in the form and according to the collection method provided for in the annual national statistical program, and in keeping with the methodological norms and nomenclatures specific to European economies (Article 25 / Law on the Organization and Functioning of Official Statistics of Romania).

An economic system can be difficult to understand in the absence of brief and distinctive short-term indicators, the first in such a set being highlighted in this article by the representative figure of the magical quadrilateral and the pentagon of the economic strategy, which demonstrate the existence of a correlation between the development of economic processes and the exogenous influences of the environment, thus leading to the emergence of the notion of impact of the cycle impacting on specific business forecasting. In summary, the paper presents eight systems of statistical financial and accounting indicators, within a literature review section, then, after a brief presentation of the working methodology and the databases used, it presents and visualizes the magic quadrilateral or square, and the and pentagon of macroeconomics strategy of Romania for 2017-2020.

### **1. Systems of statistical indicators in the specific literature**

In a market economy, the business cycle can be analyzed from the perspective of a system of short-term statistical indicators able to provide relevant, accurate, clear and non-discriminatory information to all actors of the economic scene (governments with their specific agencies, banks, entrepreneurs and business owners, households and consumers, trade unions, etc.). These key players in the economic market want to learn the dynamics of the business cycle as quickly and as accurately as possible in order to take advantage of the information received in the attempt to increase profit in times of expansion, and to minimize losses in times of recession. At least eight systems of financial accounting statistics, which are presented theoretically in this paper, can be identified as the simplest conjunctural statistical synthesis solutions for the economy, in an ascending and in-depth manner; they were selected mainly from the evolution of the specialized literature, including that of Romanian literature. As an exception to the rule of simple theoretization, the first two systems are quantified according to national forecasts, i.e. the original version of the magical quadrilateral, pragmatically developed in French literature by the Romanian-born economist Lionel Stoléru, adviser to two presidents of France, *Valéry Giscard d'Estaing* and *François Mitterrand*, as well as that of the pentagon of economic strategy.

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The simplest conjunctural statistical solutions for the economy, in a manner as synthetic as possible, are presented below:

1. the “magic quadrilateral or square” includes the rate of economic growth, inflation rate, unemployment rate and trade balance (Stoléru, 1968);
2. the “pentagon of economic strategy” derives from the above-mentioned indicator system, plus the ratio between the minimum and the maximum incomes in the economy analyzed (Korka, Tuşa, 2004);
3. “the perennial hexagon of the sustainable economy” results from the expansion of the pentagon by taking over an indicator of ecological equilibrium, or one concerning environmental protection in the investigated economy (Săvoiu, 2013);
4. the “complex heptagon of the open investment economy” complements the image of a classic magic hexagon with an indicator resulting from the investment deficit (the net balance of investments as a balance between investment inflows – FDI and domestic investments – FBCF or FBC, and the investment outflows of the economy measured and determined globally);
5. the “conjunctural and optimal octagon” is complemented by participation in the internal and international capital circuit (through internal and external indebtedness);
6. the “strategic and tactical decagon of economic competitiveness” results from the considerable expansion of the picture of the magic pentagon, and complements the image of the economy with characteristic features of the hidden GDP share, and the evolution of the general government deficit as a percentage of GDP (Săvoiu, 2010);
7. the “conjunctural dodecagon of a national economy” adds to the decagon two other very important indicators, namely the country risk rating and an essential indicator of economic hierarchy (corruption index, economic freedom index, etc.);
8. the conjunctural (monthly) dodecagonal version of Eurostat, named *Business Cycle Clock* (BCC), was created as a financial accounting statistical information system, synthesized into 12 indicators, selected for their major conjunctural relevance and capability of signaling the economic cycle (*available at <http://www.touteconomie.org/index.php?arc=dc004a> and also at <http://stats.oecd.org/mei/bcc/default.html>*): 1) GDP volume; 2) Consumption (Private final consumption); 3) Prices (Industrial producer prices); 4) Investments; 5) Exports; 6) Imports; 7, 8) Employment

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(Unemployment, volume and %); 9) Industrial production, New Products Orders; 6) Imports; 7, 8) (Unemployment, volume and%); 9) Industrial Production (Industrial Production,); 10) Construction (production in construction); 11) Retail trade deflated turnover; 12) Economic Sentiment Indicator.

The European Union has created this rather broader synthesis of indicators in a dodecagonal expression, called *Business Cycle Clock*, by capitalizing on the mechanism of official Community statistics (EUROSTAT), and ultimately providing a comprehensive solution to identify the evolution of EU economies, following the anticipation of cyclical fluctuations, adjustment in order to achieve value comparability on the market, quantitative and qualitative assessment of the use of labour resources and the link with the rest of the world (export/import).

## 2. Methodology and data bases

The existence of a system of conjunctural indicators, and, distinctively, of a system of short-term indicators, is very important in identifying both the trends of economic phenomena in terms of their cyclicity (according to forecasts or programs), and the seasonal variations caused by climatic, institutional or traditional factors, and the irregular fluctuations caused by rare or unpredictable events (strikes, floods, earthquakes, landslides, etc.).

The simplified form of presenting the economy, in a conjunctural manner, is that of a magical macroeconomic quadruple or square, which consists of economic growth rate, inflation rate, unemployment rate, and trade balance balance, with the addition of the Cohesion Index, as the ratio of the minimum and maximum income, thus resulting the pentagon of the economic strategy. The data provided by the National Commission for Prognosis (<http://www.cnp.ro/ro/prognoze>) was used as a major source of data in this paper. The data thus obtained have benefited from a unitary statistical treatment, thus ensuring the criteria of comparability and full harmonization of the concepts, norms, classifications, collection techniques and calculation tools employed in the official statistics of NSI (Romania) and Eurostat (EU), both through common measuring units (monetary units, currency), and through a pricing system specific to macro-aggregates (market prices and factor prices).

Conjunctural or short-term statistical indicators can be presented, as percentage, as structures or indices, or as rates or rhythms, such as real economic growth, which is estimated through the Gross Domestic Product Index in comparable prices:

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$$I_{PIB}^{real} = \frac{PIB_{real_1}}{PIB_{real_0}} \quad \text{or} \quad I_{PIB}^q = \frac{\sum p_0 q_1}{\sum p_0 q_0} \quad (1)$$

and is frequently expressed as a percentage, as the rate / rhythm of real growth:

$$R = I_{PIB}^q \times 100 - 100, \text{ where } I_{PIB}^q \text{ is the real indicator.} \quad (2)$$

Price stability is measured by means of three distinct statistical indicators: IIPP (index of industrial products prices), Gross Domestic Product Index (GDP Deflator), and CPI (consumer goods price index – used as the main indicator due to its characteristics), calculated as a weighted arithmetic mean:

$$IPC = \frac{\sum I^p(p_0 q_0)}{\sum (p_0 q_0)}, \text{ where: } \frac{(p_0 q_0)}{\sum (p_0 q_0)} \text{ are weighing coefficients.} \quad (3)$$

The consumer goods price index represents the basis for calculating inflation, the inflation rate being expressed as the CPI rate (in terms of percentage):

$$R = IPC \times 100 - 100. \quad (4)$$

The balance of the labour market is shown by the level of employment and that of unemployment.

The unemployment rate recorded is calculated by comparing the unemployed registered either to the active population (PA), or to the cumulative number of the employed population and that of the unemployed (PO + S).

$$R_s = \frac{S}{PA} \times 100 \quad \text{sau} \quad R_s = \frac{S}{PO + S} \times 100 \quad (5)$$

The external balance of the national economy results from the analysis of the current account of the external balance of payments. In the case of the national economy, the comparative value of trade balance ( $\Delta$ ), represents the majority share in the current account balance:

$$\Delta = X - M, \text{ where } X = \text{export volume, and } M = \text{import volume.} \quad (6)$$

The Social Cohesion Index ( $IS_C$ ) focuses on the way income is distributed between economic issues and society members, and can be determined as a ratio between the maximum and the minimum value of the

(gross or net) earnings, but can also be used as a reverse ratio – between the minimum and maximum values, essentially aiming at diminishing the gaps between accentuating polarization tendencies that distort cohesion:

$$IC_S = \frac{CS_{MAXIM}}{CS_{MINIM}} \times 100 \quad \text{or} \quad IC_S = \frac{CS_{MINIM}}{CS_{MAXIM}} \times 100 \quad (7)$$

Including this indicator in the format of the magic quadrilateral or square generates the pentagon of economic strategy, and both systems make best use, in graphic terms, of polar diagrams.

### 3. Results and discussion

Based on the calculations made on the basis of the National Prognosis Commission's (CNP) expectations, the main economic indicators of Romania for the 2017-2020 period were synthesized in Table 1.

#### Anticipations of the main indicators of the Romanian economy (2017–2020)

Table no. 1  
%

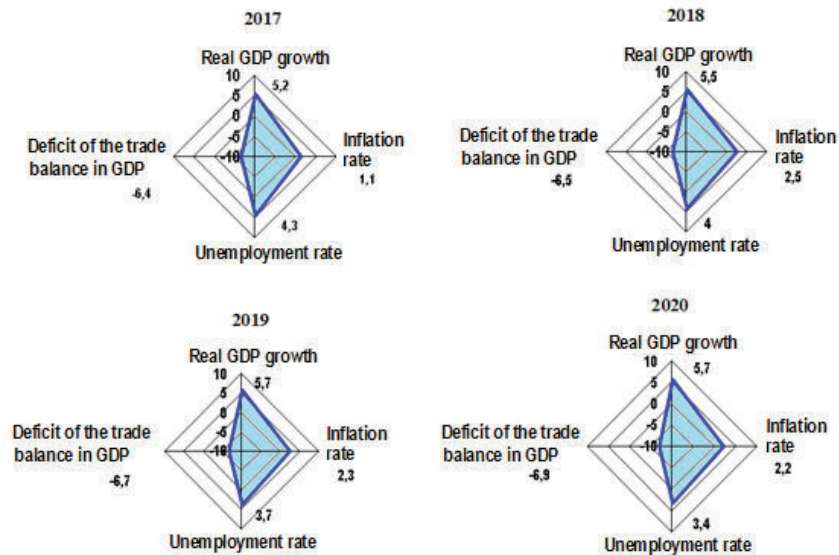
	2017	2018	2019	2020
<b>Real GDP rate</b>	5,2	5,5	5,7	5,7
<b>Rate of IPC</b>	1,1	2,5	2,3	2,2
<b>Rate of unemployment</b>	4,3	4,0	3,7	3,4
<b>Balance (X-M) of GDP</b>	- 6,4	- 6,5	-6,7	-6,9

Source: *Territorial forecast – spring version (2017)*. CNP, <http://www.cnp.ro/ro/prognoze>.

The forecast shows a steady increase in Romania's gross domestic product by 5.2% in 2017, slightly further increasing to 5.5%, and becoming stable at 5.7% in 2019 and 2020. During the same period 2017-2020, the rate of unemployment continues its downward trend, from 4.3% to 3.4%. In contrast to these expected favourable developments, the average price level, measured by means of the consumer price index (CPI), sees double and even higher increases, yet below the EU-wide limit. Similarly, another negative process is expected in terms of the trade deficit in GDP, expressed in percentage terms, revealed by a significant unfavourable trend (from -6.4%, in 2017, to -6.9%, in 2020). With the help of the previous indicators, the magic quadrilateral (or magic square) of the Romanian economy was made:

**Continuity and macroeconomic stability visually expressed by  
Romania's magic quadrilateral or square, for the years 2017–2020  
(except for the external balance))**

*Figure no. 1*



Source: *Territorial forecast – spring version (2017)*. CNP, <http://www.cnp.ro/ro/prognoze>.

In the graphical representation of the economic strategy pentagon, the information was processed concerning the social cohesion generating a community balance. As an indicator of social cohesion, a wage cohesion coefficient was chosen, given by the ratio between the projected values of the minimum wage growth, published in the governance program for 2017-2020, and the net average earnings for the same period (Table 2).

**Anticipations of the trends of social cohesion in the economy of Romania  
(2017–2020)**

*Table no. 2*

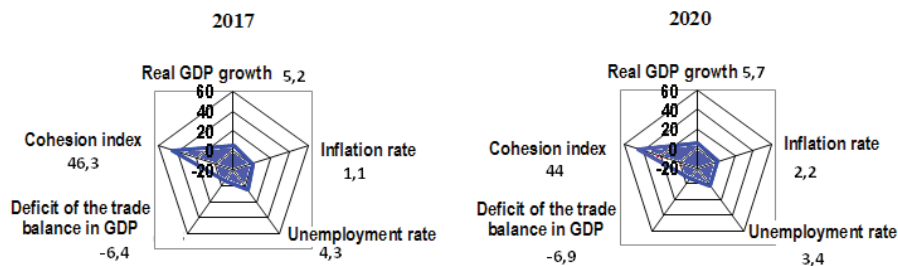
	2017	2018	2019	2020
<b>Minimum wage earning – lei</b>	1450	1550	1650	1750
<b>Ner mean wage – lei</b>	3131	3418	3702	3977
<b>IC<sub>S</sub> - %</b>	46,3	45,3	44,6	44,0

Source: *Territorial forecast – spring version (2017)*. CNP, <http://www.cnp.ro/ro/prognoze>.



**The macroeconomic forecast and the dominant tendency to ensure social cohesion, visible from the image of the pentagon of Romania's economic strategy in 2017 and 2020**

*Figure no. 2*



Source: *Territorial forecast – spring version (2017)*. CNP, <http://www.cnp.ro/ro/prognoze>

The macroeconomic forecast, expressed graphically through the radial synthesis of the pentagon of Romania's economic strategy for the years 2017 and 2020, simultaneously shows an upward deficit in the external balance, according to the pilot balance indicator known as the net balance of trade in GDP, parallel to an excessive tendency to ensure social cohesion (of an exclusively wage-oriented nature) by reducing the ratio between net average and minimum wage, which drops by 2.3%.

The synthetic nature of the construction of the systems of above-mentioned macroeconomic indicators translates into an improvement in living standards in the coming period, albeit against the backdrop of a worsening of the external balance of the Romanian economy.

**4. Conclusions**

At the same time as the economic growth is restored, there is an obvious improvement of the gross domestic product structure in favour of the accumulation and investments. The estimates for the years 2017–2020 indicate dynamic developments across the national economy, increasing its competitiveness level, and also increasing the quality of life and the real wage, amid the reduction of the unemployment rate.

The necessary balance between resources and uses is ensured by capitalizing both a comparable measuring unit (the currency), and a specific price system, centered on market and factor prices. The image of macro-aggregates of SNAs in comparable prices ensures the analysis over time, providing the real dimension of structural transformations (in the prices of the same year, considered the base year). Specific corporate or business-specific



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management should also focus on the general models and data of the expected macroeconomic developments, and also on microeconomic seasonalities, as part of the risk-based decision-making process, marked by uncertainty and resource constraints (time and money for own research), capitalizing on representative indicators to delimit the current state and the prospects of the current business.

The system of conjunctural indicators, in its simplest versions – that of the magic square and the pentagon of the economic strategy – is conceived as an open system, in which indicators can permanently be extended or restricted, modified, and even eliminated, according to the requirements of the internal users and the specific requirements of harmonization and integration of the users.

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