

## **THE SYSTEM OF INDICATORS IN THE NATIONAL ECONOMY**

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**ABSTRACT:** *The indicators are the main part of the business information system forecast; due to them, one can set forth, on the one hand, the quantitative and qualitative objectives of the forecast management tools and the means to achieve them, while on the other hand, they characterize the phenomenon and economic and social processes in all their organizational types - level, structure, influence factors.*

**KEY WORDS:** *Gross Domestic Product, National Accounting System, Money Stock*

### **1. THE SYSTEM OF INDICATORS, THE MAIN COMPONENT OF THE INFORMATION SYSTEM OF MACROECONOMIC FORECASTS**

The indicators are absolute or relative numerical expressions which quantify the economic and social objectives of each period, which determine the means of carrying out these objectives and control the efficient use of resources. A series of issues that can not be quantified, such as, for example, the ones referring to the improvement of working conditions or the improvement of the environment, are carried out to the letter. Other components of information systems, such as information carriers, information flows, technical means of recording, processing, transmission and storage of information, etc., are very helpful, and their role is to support the system of indicators to meet the requirements of the business forecast information system.

### **2. CHARACTERISTICS OF THE SYSTEM OF INDICATORS**

The system of indicators which help the forecast activity has a number of features, among which we mention the following:

- It is a unitary, coherent system, where each component is inextricably linked with one another; this lies with the unitary and coherent characteristic that must be ensured to social reproduction and with the application of a unique

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calculation methodology within all subsystems of the economic and social life. Without this unity, correlating these subsystems or activities or determining the aggregate quantities of development could not be possible;

- it has a pyramidal point, meaning that their numbers in the national economy is smaller than at the level of socio-economic base units, of companies, respectively;
- it is comprehensive, meaning that it reflects aspects of all subsystems of society, of all sides and spheres of social reproduction proportions and correlations in the economy
- its forming and improvement should be addressed systemically, due to the number of structures that reflect the whole economic and social activity
- its development is a continuous process, meaning that it improves continuously and it adapts itself to the requirements of economic and social development, to the new organizational and management structures of economy, to the strategic and tactical collectives of economic and social policies at every stage.

Within the forecast activity, the system of indicators has the following main functions: a) accurate forecast of economic and social activities' b) rigorous measurement of economic and social phenomena and processes, c) linking all sides of social reproduction in order to ensure material, human, financial, monetary and exchange balance of economic development, d) encouraging all economic units to improve the quality and efficiency of their operations; e) facilitating the control of economic – social activities.

### **3. THE MACROECONOMIC INDICATORS WITHIN THE NATIONAL ACCOUNTING SYSTEM**

The GNP (Gross Domestic Product) is the total value of final goods and services produced in a given period by production factors owned by a country. The GNP is the basic measure of national economic activity. It is necessary to distinguish between: a) the real and the nominal GNP, b) the real and the nominal value of the GNP and their growth, c) the total GNP and the GNP per capita. The nominal GNP measures the value of production in a certain period – the prices during that period, ie the current prices. The real GNP measures the same output value in constant prices, ie the prices of a base period. The economic literature considers that the GNP "measures the change in physical output of the economy, assessing all the goods and services produced in two different periods of time with the same prices, ie in constant prices. GNP can be calculated more easily than the GNP because current prices are more available.

Relating the GNP to the number of inhabitants of a country (P) one can determine the GNP per capita, that is to say:

$$PNB / loc = \frac{PNB}{P} \quad (1)$$

where:

$$PNB_n / loc = \frac{PNB_n}{p} \text{ \textit{si} } \quad PNB_r / loc = \frac{PNB_r}{P}$$

The growth of GDP, as expressed by its growth rate, is calculated as a ratio, in absolute or relative sizes, between its level from the current year and the level from the base year:

$$r_{PNB} = \frac{PNB_1}{PNB_0} \text{ \textit{si} } \frac{PNB_1}{PNB_0} \cdot 100 \quad (2)$$

where:

$$r_{PNB} = \frac{PNB_{n/1}}{PNB_{n/0}} \text{ \textit{si} } \frac{PNB_{n/1}}{PNB_{n/0}} \cdot 100 \quad \text{and}$$

$$r_{PNB_r} = \frac{PNB_{r/1}}{PNB_{r/0}} \text{ \textit{and} } \frac{PNB_{r/1}}{PNB_{r/0}} \cdot 100$$

Gross domestic product (GDP) is the value of final output of goods and services produced over a period of time by traders operating within national boundaries. GDP includes, therefore, the value of all goods and services produced within the national economy for investments, consumption, exports and making or increasing stocks. GDP can also be classified as a nominal GDP and a real GDP. All relations used for the GNP are also valid for the GDP.

However, the GNP is considered the basic indicator for measuring the economic activity that highlights the results of all economic units from a country no matter where they operate, ie both within national borders, and outside. GDP shows the results of all economic agents operating within a country whether or not belonging to that country.

#### 4. INDICATORS OF CURRENCY SUPPLY OR MONEY STOCK

The limited currency supply, MH is defined as including on equal terms bills, coins and demand deposits held by the private non-banking sector (bank accounts associated with bearer checks, where cash is available on request). The most significant changes are: Germany includes deposits that can be withdrawn with a notice of one month; in Britain, the measures taken as regards the limited currency supply are M0 and M2 (including the availability of non-financial residents – there is no M); in the United States there are traveler's checks and other bank deposits that use bearer checks.

- The currency supply in a broad sense, M2. This equals Mi plus the deposit accounts and the savings accounts and the foreign currency deposit accounts held by residents other than the central government. The notable differences are: Australia and Italy include deposit certificates (DC), Belgium includes deposit certificates and investments in shares of investment funds; In the UK, the currency supply in a broad sense is called M4 and it includes any available

non-financial residents (Britain's definition of M2 is more limited, while M3 is not published anymore); France includes various money market instruments; the Netherlands uses treasury bills, Japan focuses on a measure known as M2 + CD, in the USA, M2 consists of M1 plus overnight redemption agreements and Eurodollar deposits held by U.S. residents in branches of U.S. banks worldwide and in all the banks from Britain and Canada, shares of the mutual fund with general purpose and broker / dealer funds on the money market and short term deposits and savings deposits.

- M3 equals M2 plus other obligations of financial institutions. For example, in the U.S. M3 equals M2 plus redemption agreements and Eurodollar deposits, shares of the mutual funds destined only to legal entities from the money market and long-term deposits.
- M4, as it is used in the United Kingdom, includes the obligations of all banks and construction companies from the UK, in sterling pounds, towards other UK residents from the private sector.

Other variations are related to currency supply and liquidity. Some countries give special attention to currency supply. Thus the British M0 indicator is almost entirely represented by circulating cash and it also includes operational bank deposits in the Bank of England. The currency stock of the central bank in Germany is represented by the circulating cash and the necessary minimum savings of the banks placed in the central bank. This was the main variable target until 1987.

Some countries are interested in total liquid assets, which include a wider range of instruments and they are less affected when funds change their destination in response to the changes of the relative interest rates. It is worth mentioning the following:

- In the United Kingdom, LPS (liquidity of the private sector) includes: foreign currency, deposits, savings instruments and wholesale money market funds;
- In France, the total liquidity is M3 plus short-term securities issued by non-banking institutions and contractual savings schemes managed by credit institutions;
- In Spain, ALP (total liquidity) represents M3 plus certificates covered by mortgages, treasury bills, endorsed treaties, trade effects and deposit certificates of the Bank of Spain (ALP = liquid assets held by the public). The speed of circulation, that is to say whenever the money changes its holder within a year, can be measured by dividing the nominal GDP to any of the monetary aggregates (such as M2), expressed as an annual average.

Commercial banks can make money, from the fact that they borrow/lend most of the deposits placed within them as it is unlikely that all depositors should claim refunds at the same time. In order to be able to control the currency supply, central banks can limit the rate of new deposits that banks can lend, asking them to keep a fixed proportion of assets, as follows: a) basic reserves - cash and balances placed in central banks (operational deposits) used to meet the daily demands of customers and intra-banking settlements, and b) Secondary reserve - safe liquid assets (eg Treasury bills) which can be used to cover temporary increases in withdrawals.

Monetary authorities are trying to control the size and the growth of currency supplies in the following ways: a) changing the rates of reserve assets – this affects the extent to which banks can lend money and it is usually done only every few years, b) operations on open market - buying and selling government bonds on the open market results in increasing or decreasing the amount of money from bank reserves and private deposits, c) influencing interest rates - for example, through open market operations (which affects the supply and demand for money), changing the discount rate or imposing fixed rates for certain deposits or loans, d) control of credit - for example, limitations on the total amount that can be lent by banks, the total personal credit or the conditions regarding down payment imposed for any credit, and e) moral belief - for example, central banks have opened discussions with commercial banks, perhaps to persuade them to restrict lending. Direct control over rates of reserve assets and over the currency supply affects the supply of money, while other measures affect the demand for money.

The increase of currency supply can be observed by tracking deposits which are found in various monetary aggregates. For this purpose we may use alternative indicators of the growth of money supply:

- The balance sheet of the banking sector. Changes in column of liabilities (deposits) must be equal to changes in the column of assets (mainly, loans) and to the obligations that are not included in the monetary aggregates,
- Sector equivalents. They are measured by the money which the public service puts out of circulation (the budget surplus and the sales of government bonds to non-banking entities) plus the net increases of the banking sector (mainly bank loans) and net increases from abroad (net inflows from the external payments balance sheet, destined to the private sector).

Monetary authorities adopted several approaches of the monetary control.

The U.S. Federal Reserve (Central Bank), for example, pays particular attention to aggregate M2 as an indicator of inflationary pressure. On the whole, the reasoning is that in order to achieve price stability, long-term growth of M2 should be approximately equal to the increasing trend of production. The Federal Reserve also controls M3, but it is considered less important than M2. In the UK, M0 money supply is being controlled, while the Bank of Japan aims at M2 + CD and Germany and France mainly aimed at M3 in a broad sense.

## **5. THE INFLUENCE OF PRICE CHANGES ON THE MACROECONOMIC INDICATORS**

An important objective of price variation analysis is to estimate accurately the value of the main macroeconomic aggregates used in SNA. This means that from the statistical study of price changes, one needs to identify the main issues that are to be taken into consideration - the interpretation of changes in the nominal and the real values of the main macroeconomic indicators. The most significant problems in this context are: a) detect changes in the nominal value of traded goods and services and identify the extent of changes that can be attributed to prices, b) indicating the link between, the general price level and inflation, c) implications of nominal income

changes on the purchase of goods and services, and d) comparing the prices and volumes between countries, establishing and calculating the purchasing power parity GDP per capita in a currency recognized for international comparisons. SNA provides the framework for addressing these issues in an integrated and coherent manner.

Macroeconomic aggregates are composed of heterogeneous goods and services represented by a variety of prices and tariffs. Aggregates are calculated by summing up volumes and prices and charges. Any macroeconomic aggregate is, thus, a quantitative component, a volume and a value component. The evolution of macroeconomic aggregates from one period to another or from one moment to the next is due to both volume and price change and to the change of structures. Identifying the contribution of each factor to the overall change is difficult and involves a synthetic indicator of price trends. For this purpose there should be taken into account the following:

- prices and volumes change not only absolutely but also relatively, leading to changes in the proportion of prices and volumes as well;
- in the case of most goods, price and volume changes are not independent - usually, small quantities are correlated with high prices and vice versa;
- the description of goods and services taken into consideration changes over time because, on the one hand, new products will be turned out, while on the other hand, some existing goods are no longer produced;
- rapid changes in the quality of many goods, which affects prices.

Deciding upon the formula of calculation which summarizes the evolution of prices has been the subject of extensive debates in specialized literature. The tests used in assessing the various formulas fail to make one single choice, meaning that there isn't one formula that works simultaneously for all tests. Because one can not choose a formula based strictly on these tests, in practice, the breaking of nominal aggregates into prices and volumes is based on judgments that depend on the estimation of the outcome and on the costs of obtaining the necessary information. As a consequence, there isn't a real price index, in the sense that a certain economic development should correspond to the exact value regarding the price evolution. The real term associated with macroeconomic aggregates should not be confused with that of physical volume - miscellaneous goods meet in an aggregate size through the sum of their monetary expressions.

When one is interested in the actual size, the following should be taken into account: a) the real change must be understood only in relation to prices and the physical structure of a period considered as a basis for comparison, and b) relative price changes are based on a convention, namely on adopting a certain formula for the price index as the basis for calculating the dynamics. In statistical practice we use a limited number of price indices, among which we mention: the Laspeyres index, the Paasche index and the Fisher index.

The Laspeyres and Paasche indices summarize the relative changes in prices of a set of goods. Each has advantages and restrictions. When deciding on one of the two indices we should take into consideration the possibility of obtaining data, the easiness with which results are interpreted and the calculated indices are compared over time. The latest version of the SNA (1993) recommends the annual Fisher chain indices. Alternatively, annual Laspeyres chain indices are also recommended for volume while

Paasche indices are good for prices. Theoretically you can use both, but most statisticians choose the former. Regardless of the variant used, the smallest deviation from the corresponding Fisher index can be used as a test of significance. Using the Fisher index has the advantage that there are, at the same time, both Laspeyres indices and Paasche indices, allowing their determination by comparing the degree of influence of weighting schemes. This may be a criterion for assessing the value of Fisher indices.

## 6. MEASURING PRICES AND PHYSICAL VOLUMES FOR ASSESING MACROECONOMIC AGGREGATES

These measurements are obtained through successive evaluation of the components of macroeconomic aggregates to a level as detailed as possible. The current value of an asset  $i$  at time  $t$  (VIT) is obtained through multiplying the unit market price ( $p_{it}$ ) by the number of product units ( $q_{it}$ ) ie:  $v_{it} = p_{it} \cdot q_{it}$ . One can also use prices from the previous period which in the long run, can become constant. Estimating the flows of goods in constant prices means building a time series in which all transactions involving that certain product are expressed by the price of a base period:  $v_{it} = p_{i0} \cdot q_{it}$ . The indicators of constant prices may be expressed by current prices based on price indices for which the reference period is the period of constant prices. The same holds true for the calculation of aggregate indicators as well:

$$V_{it} = \sum p_{it} \cdot q_{it} \quad (3)$$

$$V_{i0} = \sum p_{i0} \cdot q_{i0} \quad (4)$$

In the case of product  $i$ , the index is  $\frac{p_{it} \cdot q_{it}}{p_{i0} \cdot q_{i0}}$  and in the case of the

macroeconomic aggregate index is  $\frac{\sum p_{it} \cdot q_{it}}{\sum p_{i0} \cdot q_{i0}}$ .

The Paasche index represents the price index and its rate is determined using prices from the current period, while the Laspeyres index is the index of physical volume and its rate is calculated with the help of prices from the basic period. The relations for their calculation are:

- for the Paasche index  $IP_{t/0} = \frac{\sum p_{it} \cdot q_{it}}{\sum p_{i0} \cdot q_{it}}$
- for the Laspeyres index:  $IQ_{t/0} = \frac{\sum p_{i0} \cdot q_{it}}{\sum p_{i0} \cdot q_{i0}}$

The values in constant prices have the characteristic of additivity and, as such, they may be a convenient method to build aggregate sizes, removing price variation. The value index can be determined as a product between Paasche and Laspeyres indices.

## 7. CONCLUSIONS

The estimation in constant prices of aggregates from the national accounting system requires the use of individual price indices from the base year for weighting the components of the volume. Each base year provides a different perspective because of these weights; therefore, it is necessary to update the base year, especially when this is relatively distant from the current year. In order to build consistent time series, old series should be related to the series formed within the new base year, thus resulting in a set of chained time series. It should be noted however that chained series are not additive -business implies the fact that the relationship between a macroeconomic aggregate and its components in current prices (i.e. the aggregate equals the sum of components) should be maintained also when the current values (of the aggregate and of its components) are independently extrapolated using a set of physical volume indices.

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