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Aspects regarding the analysis of inflation evolution

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Abstract. *With this work, the authors are submitting the main theories, which led to the definition of the concept of “inflation”, pointing out the successive acceptations, which the economists – starting with classics, Adam Smith’s contemporaries – have granted, over the time, to this economical phenomenon. Thus, at a first phase, the term of inflation was connected to currency, later on to money while presently it is commonly used for describing prices. This change of paradigm seems to originate in a sequence of unhappy events, probably unavoidable.*

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During the 19th century, the inflation was directly connected to the currency devaluation not to the price increases. According to a statement issued in 1919 by the Federal Reserve, "the inflation is a process of additional multiplication of currency, unsupported by a corresponding increase of goods production".

After about 60 years, the quotation taken over from the Federal Reserve statement ceased being valid so that, in 1978, the term of inflation indicated as causes: the foreign exchange rate evolution, the considerable increase of the labor cost, the weather conditions but not at all the excessive increase of money.

Consequently, the inflation definition became the victim of a theoretical "war" between the increase of the monetary mass and the increase of the price general level. What was formerly described as a monetary cause is now presented as a price effect. This change of sense let the position of anti-inflation supporter become more complicated, simply because the fact that inflation based on price levels may have, as already underlined, several reasons, which make difficult the identification of the issues meant to eliminate this phenomenon. When the inflation was a money cause with a single localization, namely the central bank, there was a single solution – the decrease of the increase rate of the monetary mass.

The classic economists, Adam Smith's contemporaries, used to be very careful when defining exactly the economical terms since they were building up a language set to the basis of an emergent science construction.

Among their first contributions, there was also the distinction between the real and nominal prices, so that the real price (value) of a product was defined as the effort implied by its production, while in nominal terms (money) it was characterized by the cost money expression (fixed in terms of gold or other precious metals). Otherwise, the value of goods is given by natural laws – the labor effort – while the nominal price differs depending on the availability of precious metals and sovereign laws, which are defining a nation currency.

Although the classic economists believed that the fluctuation of the goods nominal price may have temporarily disturbing influences on the economy (such as occurrence of a versatile redistribution of resources between the parties in a contract of fix nominal price), at the end of the day these alterations served only to change the scale by which the real price was measured. The idea that the modifications arising at the level of money quantity are affecting the goods nominal price only has been sustained by many of the early classic economists, out of them the most well-known being David Hume.

The theory has been more rigorously developed at the beginning of the 20th century, by the economist Irving Fisher, and became known as "the money quantitative theory".

The first generation of economists, successors of Adam Smith during the 19th century, were very interested on paper money and their way to relate to the causes of the goods costs modifications was based on three distinct sources:

- the value modification which considered the real resource of goods costs;
- the modification of the money price (nominal), basically generated by the fluctuation of the currency metal content;
- the currency devaluation, due to the quantitative modifications of the currency as regards the metal which constituted the national currency.

The term of inflation has been initially described taking into account the source referring to the currency depreciation, but by the end of the 19th century, the distinction between the currency and money became more and more unclear. So that, at the beginning of the 20th century, the economists had the tendency to relate to the term of currency inflation using any surroundings of money circulation connected to a commercial demand. Nevertheless, a question mark has been raised on this change as to relating to the term of inflation as well. While the currency quantity related to the precious metal mass was easily quantified, things went complicated when somebody tried to quantify the quantity in circulation exceeding the commercial demand.

During the first decades of the 20th century, the economists seem to reach a definition allowing the excess existing within the surroundings of money circulation to be explained only through its effect on the price level. Thus, the notions as currency and price inflation became connected in an incomprehensible mode.

This change of rhetoric may have an insignificant impact on the theoreticians of the quantitative economy since it seems unlikely that they can remark an important difference between the two ideas. From their point of view, the increase of the currency quantity related to the commercial demand can have one single effect only – price increase, while the increase of the price levels can have a single origin – an increase of the currency quantity corresponding to their demand.

Nevertheless, a number of economists tried to maintain the distinction between an increase of the price levels based on the additional "printing" of currency corresponding to the commercial exchanges and an increase resulting from the diminishing of the commercial exchanges for a requested demand of money.

The connection between the inflation and the price level proved to be another significant crucial point for the humanity. The setting up of Keynes's General Theory in 1936 has been considered as the very moment of the quantitative theory assault on the monetary theory, which dominated the macro-economy for a 40 years period of time.

Appealing to the conviction that the non-committed resources on a regular and persistent basis – an idea supported by the time of the Great Depression at a worldwide level – the Keynesian theory rejected the necessity of the connection between the quantity of money and the general level of price. Moreover, it sustained that the overall evolution of prices may be due to other causes than money.

Besides the separation of the price level from the monetary mass, the Keynesian revolution seems to separate the term of inflation from the money situation and to redefine it as a price description. In this way the inflation became synonym to any increase of price so that now-a-days there are very few situations showing a distinction between the price increase and inflation.

Referring to the inflation because of too many money, the economists have been forced to fight the operational issue; "how much is much?" The quantitative theory offered a clear answer to this question: "to much money" represents an increase of the monetary mass accompanied by an increase of the general level of price. When the Keynesian economic theory disputed the direct connection between money and price level, the inflation lost the association with money remaining, first of all, associated with the price situation.

Without being connected with the money offer, any increase of prices may be asserted by the term of inflation. In this respect, whenever this term is used for describing the level of prices, the anti-inflationist steps might be characterized as being against any increase of price whatsoever, including also the wage increases. According to the monetarists, this is unconceivable but an anti-inflationist strategy is concerned with a specific type of price increase – that particular increase resulting from an excessive issuing of currency. From this point of view, the forecasted target of a sustainable level of inflation became a more rational aim for the central banks.

The period of the great inflation of the years 1970-1980 has been considered, along with the Great Depression of the years 1929-1932, the biggest and most critical failure of the monetarist policies of the 19th century. During the respective period, the inflation exceeded the level of 10% for all the countries member of OECD, a notable exception being Germany.

Although the economic history was permanently confronted with periods of inflation and even hyperinflation, the economists consider the Great Inflation as a unique episode. If compared with the period of the Great Inflation, the other periods have been associated with the two world wars or other domestic events which led to major changes in one country economy and politics resulting finally in massive financings of the budgetary deficits in response of the governments needs, by monetary issues (seigniorial).

The negative consequences of the inflationist phenomenon of the years 1970-1989 had a major contribution to the changes within the perception on the inflation, from both the monetary policies makers' point of view and the individual level of the day-to-day living.

The opinion polls on the economic conditions emphasize the citizens' wishes as to living within a stable surrounding from the point of view of the price evolution. The price stability can be discussed when, as an average, the prices are neither increasing (inflation) nor decreasing (deflation) but stay stable in time.

The economic theory and literature are quite abundant in information concerning the importance and the benefices of price stability as well as the reasons at the basis of the price increases or decreases.

All the arguments submitted by the specialized literature suggest that a central bank which maintains the price stability is substantially contributing to the achievement of the economic targets concerning the economic growth and stability, the living standard and the labor occupation degree. That is why, during the decades following the Great Inflation, a remarkable convergence has been recorded as to the need to declare the price stability as main objective of the monetary policy. The price stability became the central point because, meantime, it is considered a medium term achievable objective as well as a pre-condition for the proper functioning of a market economy.

The European Union Treaty granted to the European Central Bank (ECB) the mandate of maintaining the stability at the European level, a target defined in quantitative terms as an annual average increase of the harmonized index of the consumption prices (IAPC), below 2%. The ECB Governors Council assumed, as a master aim, to keep the inflation below but close to 2%. This target forecasts an adequate positive margin in order to avoid the deflation risk but large enough in order to settle the eventual implications generated by the differential existing between the Euro zone states so that no state can survive within the Euro zone with too low inflation rates or even deflation. Moreover, this target considering also the possibility of a slight overestimation of the real inflation measured by IAPC.

Despite this acknowledgement shown to the need for the price stability, the concept is subject of periodical debates, which lately led to a lack of consensus on what should be understood by price stability. This lack of consensus arouse between the academic environment and the central banks.

All these concerns regarding the inflation have influenced also the methodology of calculating the price indices. The Chicago University Commission, led by George Stigler, has submitted the subject of the inflation measurement errors for the first time in 1961, in the USA. The main recommendation of this Commission aimed the necessity to adopt a rigorous stochastic method as to set up the sample of shops and products but an even higher strictness as regards the setting up of the products specifications.

In December 1996, in the USA also, the Boskin Commission published its Report, whose impact is worldwide recognized by the academic world, statistical practice as well as within the range of central banks. The Boskin Commission pointed out a series of possible measurement errors as far as the consumption price index is concerned, such as: product substitution within the indices, shops change, difficulties as to an adequate measurement of the modifications of quality and the need to introduce new products. The analysis achieved by the Boskin Commission on the USA data evidenced the fact that the effect of such inadequate statistics may be a major one, leading to an over-estimation of the inflation measured at the year level, with values estimated between 0.8 – 1.6 percentage points.

Besides these measurement issues, there is a general question mark concerning the covering sphere of the price indices used for the evaluating the price stability. There may be situations when a general price index is used – such as the GDP deflator – which includes the prices of all final goods and services produced within an economy and which may be considerably more relevant for investment and saving decisions.

The price index can be characterized as a factor through which the relative modification of this aggregated value is measured as a result of the price modifications is measured. Therefore, all the significant formulas of the price indices measurement can be expressed as a weighted average of the relative prices whose weights are represented by the contribution of each product (item) within the total value. We have to remind here the most known measurement formulas for the price indices, expressed as weighted average of the relative prices: the Laspeyers index, Paasche index and Walsh, respectively Torngvist indices. Expressed as a geometrical average of the Laspeyers and Paasche indices, the Fisher index can be also considered a function of the weights of the expenses arising from the total value.

The relations existing between the four most significant price indices are defined by their association with the centralized aggregates, as described by the National Accounts System (NAS). The National Accounts System is subject of periodical revisions, the last version being the one issued in 2008.

The resources and utilizations tables are helping the statistical and analytical objectives. They can cover the following main statistical requirements:

- identifying the gaps and incoherencies that affect the basic data;
- weighing and calculating the indices which are measuring the price and volume;
- getting the estimations in a residual way (in order to obtain a variable, one starts by estimating all the other variables, the unknown one resulting as a difference), mainly when considering the production and the final consumption of the specific products;
- checking out and improving the coherence, liability and exhaustively of the data contained by the tables of resources and utilizations as well as the secondary figures (such as, for instance, those relating to the production accounts).

The price indices have a long history and a large variety of utilization, from the adjustment of the wage level, pensions and payments included within a long-term contract, deflation of the national accounts aggregates up to macroeconomic policies making.

The more simple and earliest index example was the one proposed by William Fleetwood in 1707, who intended to measure the average modifications of the prices paid by the Oxford University students, over a two and half century period. Another example from the 18^{th} century was the index calculated by the Massachusetts legislative body, which undertook to index the pay to the soldiers fighting the revolutionaries' war against England.

The 19th century counts for the most interesting moment in the indices theory history. In 1823, Joseph Lowe published a research concerning the agriculture, trade and financial services. In the frame of this research, the author developed the concept of price index as modification of the monetary value of a set, or classified list, of goods and services. This method is still in use nowadays. Diewert (1993) argues that Lowe can be considered as the father of the price indices. Later on, during the 19th century, other significant contributions to the indices theory have been achieved, including also those of Laspeyers (1871) and Paasche (1874), whose names are associated with the largest spread types of price indices. Marshall (1887) sustained the utilization of chain indices, where the indices measure the prices evolutions from one year to another, linked together in order to estimate the evolution of the indices over long periods.

In 1922, Irving Fisher published his work, considered as a monumental one by those concerned with the indices theory: *The Making of Index Numbers.* This work emphasized Fisher's interest on the inflation as well as his support for the money quantitative theory. Fisher investigated the properties of hundreds of types of possible formulas for measuring the price indices, off which, his favorite is the geometrical average of Laspeyers and Paasche' indices, known presently as Fisher index.

In 1924, Konüs published a work in which he submitted the foundation of the economic theory of the life cost index (COLI) that is elaborated with the purpose of measuring the cost modifications meant to maintain the same living standard (utility or welfare). In fact, the consumer is not buying the same set of products and services during different periods, adjusting his own expenses depending on the prices changes and other factors, which interfere in the economy. Counterparty for the COLI production is the goods fix cost index.

Another significant approach within the numbers theory was that of Divisia, in 1926, which is grounded on the assumption that prices and quantities can change over the time, in a continuous and instantaneous manner.

Consumption prices indices (IPC), which are the most known price indices, are measuring the goods and services price modifications from a consumer's point of view. IPC is based on the prices of those goods and services usually bought by households. In order to secure the consistency of the price indices at European level, the *Harmonized Index of Consumption Prices (IAPC)* has been drawn up, as a harmonized index of the consumption prices for all the EU countries that measures the inflation for the euro zone.

Production price indices (IPP), which measure the evolutions of the transaction prices of the producers as well as the monthly gross modifications in the trading price of the goods and services, on the domestic and international market.

Purchasing power parities (PPC) compare the prices levels between countries or regions. They are used in order to convert prices expressed in national currency into a kind of a common artificial currency, with the purpose to eliminate the differences between the levels of price among countries or regions and to calculate the present/real purchasing power of the resident population.

As an economic, monetary and social phenomenon, the inflation placed itself in the center of the researchers' attention, irrespectively the different historical periods and schools which get integrated in the Romanian monetary and financial thinking. The causes, intensity, occurrence forms but, mainly, the effects generated by the inflation cannot be identified, in their totality, with the same circumstances and expressions that this phenomenon faced within other zones and countries of the world.

We outline the inter-relations existing between the main types of price indices:

- IPC under the pressure of improvement – aspects concerning the utilization, calculation and measurement of the statistical impact on the administrated prices and tax modifications on the inflation;
- The statistical evaluation of the stage of nominal convergence of the inflation rate in Romania; proposes a model of statistical evaluation on the stage of accomplishment of the nominal convergence criteria as regards the price setting. The evaluation takes into consideration a theoretical synthesis of the Harmonized Index of the Consumption Prices, a statistical analysis concerning the inflation evolution in Romania and the existing gap as against the reference value for accomplishing the nominal criteria of convergence;
- IPC and the deflator – GDP – the main differences existing between the two types of price indices apply to the concepts and definitions, the covering sphere of the two indices and calculation formulas proposed for the two indices.

In conclusion, this work runs over the significant and relevant aspects for the statistical theory and practice of the price indices existing in the statistical system of prices. In order to understand fully and to evaluate with more accuracy the factors that influence the prices and inflation, it is necessary to have an elaborate theoretical knowledge of the process that makes the basis of setting up the statistical system of prices.

The need of development of a coherent and consistent price system occurred by the time when the inflation phenomenon has been considered as a global one, with devastating effects on the world economy.

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