THE IMPACT OF INFLATION'S EVOLUTION ON CONSUMPTION

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Abstract

In this article, the authors analyze the impact of inflation on household consumption. The study includes an overview on the theoretical concepts in this field, namely based on consumer's demand, price, buying decision, the structure of total expenses and the income effect. The authors are also concerned with the assessment of the household consumption and the indicators which measure the inflation.

Key words: *inflation, consumption, demand, products, expenses*
JEL Classification : *E31, E21*

Introduction

The demand of the household consumption represents all the food products, industrial goods and services required by the population in a given period of time. It is determined by various factors, such as: individual and family needs, consumer's preferences, sale system, the degree of supply network of selling, traditions of consumption, social characteristics and demographics of the population, the structure and distribution of income, prices of various goods and services, etc.

The price can be seen as a tool for prompt reaction to restore the balance between supply and demand. For example, when there is an excessive demand over supply of certain products or services, increasing prices restore the balance, thus decreasing interest in buying that product. When the market is in excess supply compared with demand, balance is restored by reducing the price. At the same time, we should also mention the reverse, namely that the price depends in its turn, by the supply-demand ratio.

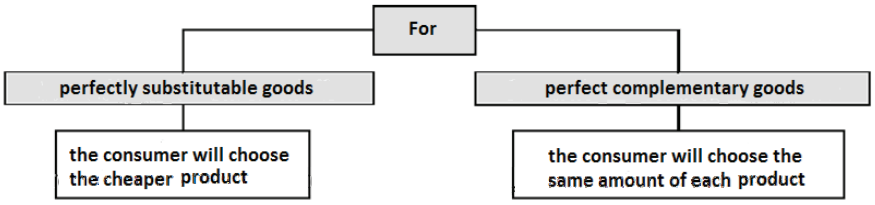
Literature review

Anghel, Anghelache, Manole (2016), Anghel (2015) analyze the evolution of the inflation in the context of the Romanian economy. Anghelache and Anghel (2016) present the basics of economic statistics, Lyberg (2004)

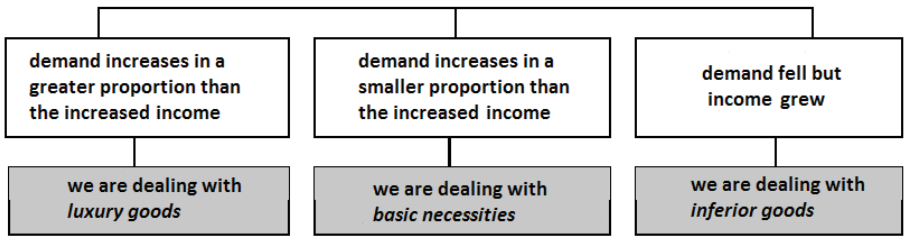
treats quality in statistical organizations. Anghelache and Manole (2016, 2015) analyze the correlation between economic growth, inflation and unemployment. Anghelache, Voineagu, Gheorghe (2013), Anghelache and Sacală (2015) describe the theoretical framework of the inflation. Atanassov and Kim (2009) study the correlation between labor and corporate governance. Nielsen (2015) approached the uncertainty of economic growth. Pauly (2010) studied the perspectives of financial statistics in France. Savor and Wilson (2013) present an evidence-based analysis on the attitude of investors towards risks. Solomon, Bamossy, Askegaard, and Hogg (2006) approach the consumer behavior. Turnovsky (1995) develops on macroeconomic dynamics. Yin (2009) presents an econometric-based estimation of the unseen, underground economy.

Research methodology

In most cases, the decision whether to buy or not to buy a product is based on economic reasons mainly linked to the price of the product or its destination in consumption.



In the case of ***normal goods,*** we can observe that when:



Remember that some categories of goods have a bigger share of the total expenses, while others have smaller share . As cash income increases, the sum of money spent on food is reduced. Therefore, the sum of money spent on food is bigger for the persons with low incomes than those with high incomes. In this situation, the coefficient of elasticity of demand for food products is higher for people with low incomes, compared with those with high incomes and very high incomes. For example, a large share of money spent on food

means a lower standard of living, in this case the financial resources are mainly allocated to ensure daily meals of population.

For the period analyzed in this study, the average monthly consumption of the main food and beverages, expressed in monthly quantities for a regular person and equipping households with durable goods comes to emphasize this aspect.

Likewise, for the period analyzed here, it appears that food products and soft drinks represent almost half of total consumption expenses, which means that the Romanian standard of living is low, the financial resources being mainly allocated to ensuring daily meals. Furthermore, equipping households with refrigerators and freezers are prevailing.

The income effect is the change in the consumer's real income as a result of changes of product prices. In principle, a reduction in the price of a product increases the demand for that product. Part of this increase is due to the so-called real income effect according to which the income is changed if the price levels are changed, reflecting in this way, the purchasing power. Changing the unit price in order to reduce its demand determines the process of increasing demand, namely the increase in the quantity required, while increasing the unit price causes contraction or decrease in the required amount of the product on the market. The causal relationship between changes of a product unit price and the change of the demanded quantity represents the general law of demand.

The population income is one of the most important factors because the primary purpose of the consumption depends on the volume, structure and manifestation of household consumer's demand.

According to the Romanian statistical practice, the data of the population income are taken from the Household Budget Survey, (a series of statistical surveys conducted in agriculture and industry, as well as records of ministries and administrative bodies in the field).

The Household Budget Survey is the main tool for evaluating population income and expenses. In this survey, the data of population income are recorded and centralized after a clear classification. Thus, the total income comprises financial income and goods trade evaluated in Ron.

The financial income of population represents the total cash coming from various sources for which there is no reimbursement obligation (including sums of money withdrawn from the CEC Bank, other banks and similar institutions, loans and credits). It also includes the following types of income:

- Income coming from salary and other salary rights include all sums of money and products (evaluated in Ron at the selling price of the unit) collected in the form of salaries, bonuses and compensations, calculated as

a percentage or fixed amount of money, given for special work conditions (established by law or by individual or collective contracts), for the actual working time, within normal working hours or additional working hours, and also for the non-working time, remunerated in bonuses from net profit, other income included in monthly salary, regardless the period in which we include the income taxes, contributions, installments, loans etc;

- The income from agriculture represents all the sums of money coming from the companies and agricultural associations, sales of food products, animals and birds (poultry and pets) and from performing agricultural work;

- The income from independent agriculture activities refers to the entire sum of money made by household members from trade, services, jobs, selling or leasing assets obtained in business and other income coming from related activities (activities related to the business), bank interest received for cash. It also includes income from liberal professions, performed individually or in various forms of scientific, literary, artistic and educational associations for household needs. It also includes income coming from intellectual property rights (know-how rights, trademarks, franchises etc.), and copyright.

- Income from pensions and other social benefits include sums of money from pensions obtained as a result of retirement, early retirement, early partial loss of working capacity, for surviving family members , farmers, sums of money for veterans and war widows, persons persecuted for political reasons, martyr heroes and their descendants for temporary disability (sick leave), for maternity and child care, unemployment benefits, child allowances and scholarships for students, aid for special disabilities, social benefits granted by municipalities and other social benefits.

- Property income is derived from rental and leasing, as a result of having shares in closed funds/unit trusts, deposits in CEC Bank or in other similar institutions (leasing or renting the property, dividends, interest).

- Income coming from selling the household assets is resulted from the transfer of ownership of assets and shares, the sale of currency, land, buildings and other new or old goods that are not of own production;

- Other financial income refers to that coming from insurance, gambling, sums of money received from persons outside the household.

The income of household members can be obtained both as cash and as products. Those who receive only cash income to satisfy the surviving needs, buy products from the market, satisfying in this way the consumer's demand. There are also sections of the population who earn income as products and therefore part of the consumption needs will be met from their own production through self-consumption. Thus, the demand will only partially reflect the social need and the income will reflect the application size.

According to the Household Budget Survey, the income evaluated in products (evaluated in Ron) represents all services and food and non-food free of the household resulting from its own resources (from production, inventories, employment, given as a gift, etc.). Their evaluation is made in lei, the average purchasing prices of products during the reference month by region.

For this reason, the income is structured in various ways, the most important being the satisfaction of the main necessities through consumer's demand. The other part is earmarked for paying taxes, savings etc. Therefore, income is divided into three categories: global income, net income and real income.

Global or nominal income is determined by adding the income resulting from labor and property income received from social benefits, and net income is obtained after paying direct taxes and social taxes charges out of the global income. The real income is calculated as a ratio between net income and consumer price index.

Household consumption is a complex category and its statistical (numerical) description cannot be made by using a single indicator, but based on a system of indicators.

The system of consumption indicators of the population consists of the following groups of indicators:

A. Value indicators of consumption:

- total household consumption;
- private household consumption, based on personal income;
- public household consumption;
- material household consumption, of tangible and intangible services.

B. Consumption indicators in natural units:

- average annual consumption per citizen of major food, non-food categories and services.

C. Consumption indicators in natural-conventional units:

- food consumption indicators expressed in calories and nutrients.

D. Indicators showing the population with durable goods.

The indicators of household consumption describe the quality of life and economic development of a country and it is a subsystem of the indicators of living standards. A specific feature is that their calculation methodology is similar to the methods and procedures for calculating statistical indicators.

Thus, the processing statistical data for household consumption is based on the grouping method, on building series of on unvaried and multi-varied division, of statistical series of interdependencies, on time series, etc., methods based on which the system of indicators of the household consumption resulting in a form of absolute size (aggregate) and relative sizes.

Relative sizes, in the household consumption field, are calculated in various forms, such as: sizes of relative structure, intensity, coordination, medium size, indexes, etc.

When calculating the household consumption indicators, we take into account that two large groups of economic phenomena are involved: phenomena of flow and phenomena of stock. The phenomena of flow, such as gross domestic product, private consumption, investment, etc., compared to the phenomena of stock, such as population, providing people with goods, change their size in time, their quantification being able to be done for short periods of time (month, quarter, semester, year).

The indicators of flow phenomena result as aggregated indicators, as they are obtained as a result of summing up the components of the global phenomenon. These flow indicators, in an aggregated form, are expressed both in value units and in natural units.

Stock indicators of the household consumption refer to those phenomena that can be quantified only at certain times: population, number of families, number of cars, etc. and are used at calculating consumption indicators as average sizes or average intensity sizes.

The relative sizes of the consumption phenomenon results from reporting a flow phenomenon to a stock phenomenon, but the flow phenomenon is quantified over a period of time, and the stock phenomenon is quatinfied at a certain moment. Therefore, it is necessary to statistically measure the phenomena in those periods of time in which flow phenomena were determined. In oreder to transform the stock indicators into indicators compatible with flow phenomena in order to obtain significant derived indicators, we use the simple or average chronological ratio.

By reporting the flow indicators to stock indicators, we obtain two categories of indicators:

- average indicators, which refer to the average annual consumption per capita or per family, per product, or homogeneous groups of products;
- relative indicators of intensity, which refer to the average annual providing of households with different consumer goods.

In terms of consumption, statics analyze the dynamical and statical social needs in relation to their nature by measuring methods (in the case of quantitative needs, such as meat consumption per capita, milk consumption per capita etc.), by counting (in the case of qualitative needs, such as the number of families who own a car, TV, etc.) or by calculations (in the case of derived indicators, such as the number of hospital beds per 1000 inhabitants, the number of inhabitants per one doctor etc.).

The structure of the indicator system must contain the consumption indicators determined at the territorial level, according to the region. By using these indicators, we can evaluate the level of consumption in accordance to the consumption backgrounds, socio-professional categories, to the number of family members, etc., case in which we can follow to remedy existing gaps between certain areas of the country.

Household consumption as a mass phenomenon involves satisfying the social needs and presents the property as a variable from one individual to another, from one family to another, from one country to another. This consumption variability in time and space is identified by territorial statistical indexes and dynamic indexes. The statical and dynamical characterization of consumption must take into account the repport of quantity-quality specific to its nature and content. For example, a high percentage of food consumption in the total consumption indicates a low level of economic development of the respective country and a high percentage of services in the total consumption is a specific feature of the developed countries.

The population needs can be statistically measured and characterized by determining the minimum subsistence consumption of the individual and the family.

Based on the minimum standards of consumer's needs, they are grouped into:

- physiological rules for food consumption;
- rational norms of consumption for clothing and footwear;
- rules for providing the household with durable goods.

Measuring the level of satisfaction of the consumer's needs by counting is performed by using nominal variables such as: the number of families having their own home, car, the number of people practicing international tourism, etc.

The relative sizes of structure and the relative sizes of coordination have a particular importance in the analysis of variation in time and space, household consumption.

The relative sizes of structure are used to characterize the structure of household consumption in homogeneous groups of products, in accordance to different socio-professional categories of the population, or territorial profile.

These relative sizes of structure are often used in the statistical analyzes published by the National Institute of Statistics .

The evaluation by using the calculating of the level of satisfaction of the social needs is made by using the relative sizes (of structure) - the number of families having a personal dwelling out of a total number of households, the number of families having a car out of the total number of families, and by

using the average sizes - average consumption of various products per capita.

In the statistical analysis of the household consumption indicators, we take into account the characterization of their variation in space, from one country to another, at the level of a specific country, or in time and space. In order to make these spacial or dynamic comparisons, these value indicators have to be expressed in comparable prices, constant variables or real prices.

Thus, when analyzing the evolution in time, at the level of a single country, the indicators must be expressed in real prices, which are the prices used in a certain period of time in that country. When comparisons are made in time and space, we use certain prices expressed in a particular currency.

The dynamic analysis of a value indicator is made by using three indices: the value index corresponding to the analyzed phenomenon, the index of its physical volume and the price index used in assessing the phenomenon.

Likewise, the dynamic analysis of a value indicator is made by using three indices: the value index corresponding to the analyzed phenomenon, the index of its physical volume and the price index used to assess the phenomenon[1]. In practice, aggregate indices frequently turns into average indices, arithmetic or harmonic, as appropriate[2].

The methodology of calculation presented above has difficulties in building long dynamic series, series which are absolutely necessary to estimate trends in the evolution of the total consumption, consumption by groups of products product and even at the level of basic goods. This difficulty appears if inflation is increasing rapidly (annual price increase by > 15%) when construction of the physical volume index requires that, in extremely small real periods of time, real prices should be replaced by others of recent date, in order not to change the index size (operation which implies that in the

1. Between the three indices of consumption of the population, the relation is: $I_C^v = I_{C(L)}^q \cdot I_{C(P)}^p$

where: $I_C^v = \frac{\sum q_t \cdot p_t}{\sum q_0 \cdot p_0} =$ **indicele valoric al consumului populaţiei** or $\frac{\sum q_t \cdot p_t}{\sum q_0 \cdot p_0} = \frac{\sum q_t \cdot p_0}{\sum q_0 \cdot p_0} \cdot \frac{\sum q_t \cdot p_t}{\sum q_t \cdot p_0}$

2. If the index is Laspeyres, then:

$\frac{\sum q_t \cdot p_0}{\sum q_0 \cdot p_0} = \frac{\sum i^q \cdot q_0 \cdot p_0}{\sum q_0 \cdot p_0} = \frac{C_t^*}{C_0} = I_{C(L)}^q$; where $I_{C(L)}^q$= Index of physical volume of calculated Laspeyres index, average individual physical consumption indices $\left(i^q = \frac{q_t}{q_0}\right)$, weighted with the expenses pattern in the base period $\left(\frac{q_0 \cdot p_0}{\sum q_0 \cdot p_0}\right)$, C_t^* represents the consumption in period t = 1, 2,…, n, expressed in comparable prices, prices used in the base period (0).

If there Paasche index type relationship:

$\frac{\sum q_t \cdot p_t}{\sum q_t \cdot p_0} = \frac{\sum q_t \cdot p_t}{\sum \frac{1}{i^p} \cdot q_t \cdot p_t} = I_{C(P)}^p$; unde: $I_{C(P)}^p$ = index of consumer prices calculated as a Paasche index.

construction of long series of data of private consumption, we have to add to the dynamic series of the household consumption expressed in different prices in order to obtain a long series, calculated based on the same prices) and less If latent or slow inflation (prices increase varies between 3 and 4% annually).

Using the index of physical volume in characterizing the dynamics of the household consumption requires evaluation of this indicator in real prices, and the calculation of its values.

In statistical practice, deflationary household consumption involves the following steps:

1. Calculate the consumer price index Paasche type by reporting the value index of household consumption to the index of physical-volume of household consumption, when the index of physical volume of consumption is known[1].

2. Report the use of the consumer price index Paasche obtained in the first step[2].

The dynamics of the physical volume of the household consumption is calculated as a Laspeyres group index. If we have a time series, we can calculate the fixed base indices and chain based indices, with possible relations of transition from one series type to another. For example, if we have a time series of indices with fixed base consumption, with the relationship:

$$I^{C}_{t/t-1} = I^{C}_{t/0} : I^{C}_{t-1/0}$$

We can build a series of based chain indices of consumption.

In reverse, if we have the dynamic consumption-based chain, by using the formula:

$$I^{C}_{t/0} = I^{C}_{1/0} \cdot I^{C}_{2/0} \cdot \dots \cdot I^{C}_{n/n-1} = \prod I^{C}_{t/t-1}$$

We can build the series of the consumption dynamics with a fixed base.

In order to characterize the dynamics of the same phenomenon, we use the geometric ratio calculated based on indexes of dynamics with chain basis:

$$\bar{I}_C = \sqrt[n-1]{\prod I^{C}_{t/t-1}} = \sqrt[n-1]{I^{C}_{n/0}}$$

1. $I^{p}_{C(P)} = I^{v}_{C} : I^{q}_{C(L)} = \frac{\sum q_t \cdot p_t}{\sum q_t \cdot p_0}$

2. $C^{*}_{t} = \frac{C_t}{I^{p}_{C\,(P)}} = \frac{\sum q_t \cdot p_t}{\frac{\sum q_t \cdot p_t}{\sum q_t \cdot p_0}} = \sum q_t \cdot p_0$

Special attention is given to the consumer price index. The consumer price index is used in the analyzes and economic forecasts and it is used to estimate quantitative inflation in a particular country, and linked directly to the consumer, expressing the absolute change or relative change of the purchasing power of nominal revenue or nominal salary.

Theoretically, the General Price Index (GPI), of consumer goods and services can be calculated in three forms:

• Laspeyres index:

$$IPC_{(L)} = \frac{\sum q_1 \cdot p_0}{\sum q_0 \cdot p_0} = \frac{\sum i^p \cdot q_0 \cdot p_0}{\sum q_0 \cdot p_0} = \sum i^p \cdot g_{C_0}$$

• Paasche index:

$$IPC_{(P)} = \frac{\sum q_1 \cdot p_1}{\sum q_0 \cdot p_1} = \frac{\sum q_1 \cdot p_1}{\sum \frac{1}{i^p} \cdot q_1 \cdot p_1} = \frac{1}{\sum \frac{1}{i^p} \cdot g_{C_1}}$$

• Fisher index (ideal):

$$IPC_{(F)} = \sqrt{IPC_{(L)} \cdot IPC_{(P)}}$$

One can deduce easily that the three group indices of prices are calculated as arithmetic ratio of individual indicators (GPI (L)), as ponderated harmonic ratio of individual indices (GPI (p)), or as the geometric ratio of the first two GPI (F)).

In practice, however, the variation of consumer prices is expressed either with the help of a Paasche index, or with Laspeyres index.

The main properties of a social-economic indicator are presented as follows:

- to be uncompensatory, that meaning not to compensate the negatives aspects with the positive ones, thus hiding its structure and size. Unfortunately, this shortcoming keeps all indicators of household consumption calculated as average ratios. To avoid this aspect, it is recommended that all average indicators backgrounds to be accompanied by at least one dispersal indicator, usually the coefficient of variation of the described phenomenon;

- to be discriminatory, that meaning to be is sensitive to small fluctuations of the phenomenon so as to allow a correct assessment of its movement, a condition met by most of the household consumption indicators.

- to be positive, that meaning that the variation direction (±) to correspond to the significance of the described phenomenon, such as: the increasing trend in the gross domestic product per capita expresses a positive aspect, while the rising trend of inflation or unemployment reflects a negative economic evolution on the economic plan, restriction which from the consumption point of view is almost entirely carried out and, in

particular cases, complementary indicators (rate of employment instead of unemployment) , can be used.

- to be anticatastrofic, that meaning that small variations of its factors should cause small changes,

- not to be explosive, that meaning not to have ups and downs which involve changing the content of the quality indicator, otherwise a property of all indicators consumption.

Conclusion

To conclude, the main factors which determine the change of the demand on the market for a particular good are: changes in the consumers' income, changes in prices of goods, the number of buyers, predictions regarding the evolution of prices and incomes, buyers' preferences. At the same time, the changes that have taken place in recent years have had a significat impact on the living standards and thus they have influenced consumption.

The content and the structure of the system of household consumption indicator has to adapt to the evolution of society and have continuous improvement in accordance with the socio-economic development indicators.

Due to the particular importance of the socio-economic development indicators, which include indicators of household consumption, in the static and dynamical analysis of national and global economy, as well as in the globalization process that manifests at international level, the theory of statistics is more rigorous on the conceptual and formal plan with these indicators attempting to achieve an international standardization of concepts and calculation (international comparability issue).

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