

# **INFLATION IN BULGARIA - METHODOLOGY OF MEASUREMENT AND TENDENCIES IN ITS DEVELOPMENT DURING 1991 - 1992**

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## **INTRODUCTION**

Price liberalization occupies a central place in every stabilization program. Its purpose is to reach a rational relative price structure and thus to eliminate the imbalance between the solvent demand and supply of goods and services, set up in the terms of administrative valuation of prices. By removing price level control arises a possibility of unfolding hidden inflationary processes in the economy. The choice of a liberalization scheme is an important problem in this aspect. It is to direct the completion of price liberalization process so that an optimum effect is reached. This problem has been differently solved in countries which economies are in a state of transition. In general, there are two alternatives how to carry out the price reform: a simultaneous liberation of prices of almost all commodities (carried out in Poland and Yugoslavia) or a gradual price liberalization (Romania and Hungary).

The stabilization program in Bulgaria, supported by the IMF, began in condition of acute macroeconomic imbalances, considerable loss of export markets, and limited external financing which was due to the declared moratorium on foreign debt payments. The fiscal and monetary policy, along with exchange rate liberalization, price reform and income policy are its main components. In February, 1991, through an enormous jump in the general price level, Bulgarian government carried out a simultaneous liberation of prices. Its main idea was, in a short period, to eliminate the accumulated macroeconomic imbalances and reduce money overhang, while removing price deformations.

The purpose of this study is to examine the existing measurers of inflation and to make an analysis of the price policy carried out by the mid 1992. The price dynamics, as well as the main results of their liberalization and the expected development of inflation process will trace out tendencies in a short-term perspective.

### **1. INFLATION MEASUREMENT**

From practical and socially-political point of view the question of the accurate report on inflation is gaining in importance. In connection with its measurement two problems arise:

1. What price index measures inflation?
2. How to calculate the total price index from the different prices of goods and services?

The inflationary impact on various economic sectors is different. The only way to determine this impact is by using the official statistical data which reflect the changes in the entire price system. The National Statistical Institute (NSI) has a considerable progress in the development of consumer, retail, and producer price indexes. Real deflators of the final demand elements and this of GDP are still not under production. Import and export price indexes are annual and to a considerable degree unreliable.

The most widely spread conclusions regarding the power and volume of the inflationary processes are drawn on the basis of consumer and retail price indexes. They are under development since May 1990.

#### **1.1. Retail Price Indexes (RPI)**

The total retail price index (RPI) measures the change in goods' and services' retail prices, weighted with the realized commodity and services turnover. It is calculated on the basis of a combination of about 1400 goods and services. There are few stages in the algorithm of its calculation:

1. Defining the average price  $p_i$  of a given good  $i$  for the scales of the entire country as an arithmetic mean of the average good prices in the particular regions\*, weighted with the relative share of the population in them.
2. Defining the relative prices  $p_{i1}/p_{i0}$  for each of the 1400 goods and their generalization in price index  $P_k$  of a group with homogeneous goods  $k$ . The lack of commodity turnover data at such a low level necessitates the number of registrations for each separate good's prices to be used as weights. The registrations number of the previous month has served as weights during 1991 (i.e. the weights have been changed monthly at this level of generalization). Since 1992 the number of price registrations of each good in 1990 has been used as weights. However, the acute domestic shortage of goods in 1990 makes this index inaccurate.
3. Thus obtained, the subgroups indexes of goods and services  $P_k$ , at a higher level of generalization, are weighted together with the commodity turnover realized in the retail commercial network  $Q_k$  of each subgroup  $k$  during 1990. Thus, the total RPI is calculated on the basis of their further aggregation.

The use of the commodity turnover as weights is an essential shortcoming, as far as the high-priced goods realize larger turnover, other conditions equal, and hence higher weight which increases the actual variation in prices. This is the general defect of all indexes using fixed weights. If the relative goods' price changes during the period of inflation, then the demand for goods and services which prices have a smaller increase goes up. Thus, the used method to calculate the RPI does not reflect the effect of the change in demand. It corresponds to a larger weight of goods whose prices are growing relatively faster, and vice versa. Consequently, the total index indicates higher values than the actual increase in prices.

Since May 1990 (since the beginning of its development) the weights of goods have been changed twice and these of services - three times, without ensuring a proper statistical consistence and compatibility at these transitions. That is why, the RPIs do not only indicate the changes taking place in the price level.

Until mid 1992 that index was one of the coefficients used in correcting the size of wage bill on quarterly basis.

\*They correspond to the former 28 regions which Bulgaria was divided into.

## **1.2. Consumer Price Indexes (CPI)**

The consumer price index (CPI) measures the change in the prices of goods (or group of goods) and services, using the relative shares of different types household expenditures (derived from their budgets' survey) as weights. It is constructed on the basis of the retail prices indexes for 11 groups of goods and services\* weighted with the household expenditures' structure in calculating the total CPI. By the beginning of 1992, an expenditure structure as of 1989 has been used for the calculation of CPI. This structure has undergone substantial changes during 1990 and especially 1991. Since 1992 the weights have been actualized by putting the expenditure structure

as of October, 1991 into practice. The revaluation of the index in using the same weights (these of October, 1991) provides the following results:

Table: Consumer Prices Chain Indexes

Months (NSI)	Total Index Total	Revalued Index
January 1991	113.60	112.98
February	222.90	235.82
March	150.50	149.24
April	102.50	101.45
May	100.76	100.51
June	105.89	105.29
July	108.39	108.16
August	107.50	108.69
September	103.80	103.71
October	103.27	103.04
November	105.02	104.97
December	104.92	104.82

\* These groups are as follows: food products; tobacco and beverages; clothing and shoes; housing, heating, electricity, home furnishing; cultural and social life; health and hygiene; postal and transportation services; taxes and fees; others.

General public usually identifies the increase in consumer prices with the level of inflation. The inflationary impact is different depending on the character of goods (or groups of goods) on which the income is spent. In connection with this, additional CPIs are under development for the different types of households (with different incomes, place of residence, social status, etc.). However, they are not practically applicable to differential correction of the incomes of different types of households while adapting to inflation.

### **1.3. Producer Price Indexes (PPI)**

In 1991 the NSI did not publish producer price indexes (PPI). That is why, the dynamics of the physical volume of output was measured indirectly and quite roughly through elimination of the price level impact on the volume of production. The indicator "change in price level effect" was estimated subjectively by the enterprises themselves, which could not always succeed in "clearing" away the impact of changes in output structure. According to the statisticians, this method was extremely inaccurate, unreliable and with questionable chances for implementation (particularly in the area of construction, trade, etc.).

During the last year NSI began to work on a statistically reliable PPI. It is based on data about 600 groups of goods and was published for the first time in February, 1992. Since March, 1992, the observed aggregate was broadened over 950 groups of goods.

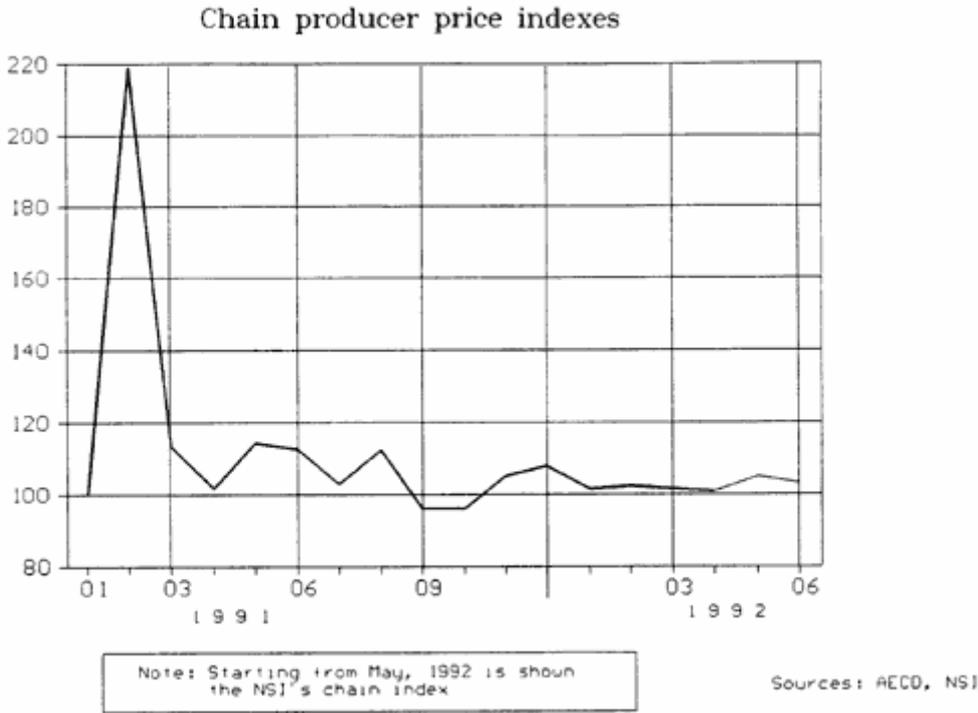
During 1991 the index constructed on the basis of "change in price level effect" has increased less compared to PPI (their values are 396.4 and 503.1 respectively, 1990 == 100). This means that the physical volume of the industrial output during 1991 has been overstated due to the officially used deflator.

Unfortunately, the PPI developed by NSI, was estimated on variable basis until April, 1992 (per month of 1990). This made it difficult to trace out the price dynamics in 1991. Since the beginning of 1991 chain indexes of these prices were constructed in the Agency for Economic Coordination and Development (AECD) on the basis of the output structure as of May, 1991\*. They were calculated on the basis of a combination of 372 groups of commodities where data about the produced quantities was available as well as the average monthly prices for every month of 1991.

\* The chain PPIs for 1991 have been constructed by Valentin Tchavdarov, an expert in the AECD on the basis of the initial data provided by the NSI.

NSI also introduces a monthly chain index since May, 1992.

Chain producer price indexes:



Note: Starting from May, 1992 is shown the NSI's chain index.

The examined three types of price indexes measure the scales and intensity of the inflationary process for the households, on one hand, and for the industrial output, on the other. They will be used as measurers of inflation in the further analysis.

## 2. PRICE POLICY

The measures concerning the market price-formation transition undertaken during 1990, were rather limited and the greater part of goods and services (amounting to over 2/3 of the retail commodity turnover) became an object of direct price control. In spite of the high inflation reached at the end of the year (64%), a powerful inflationary potential was established. Thus the government was forced to carry out a radical price liberalization as an unseparated part of the overall stabilization program at the beginning of February, 1991. In this case the correction in prices affected all goods and services although in different degree. The average price level increased more than 2.2 times within a month only and thus became considerably higher than the one originally expected\*. Some limitations remained over prices of a narrow range of essential commodities and some strategical raw materials and fuels which were gradually declining in accordance with the stabilization program. So, after the liberalization process was completed, the price system included several types of prices depending on the degree of control set over their growth.

\* About three times for the whole 1991.

**2.1. Fixed Prices.** These prices have been introduced since the 1-st of February, 1991 and are fully controlled. They cover four commodities - electricity, thermal energy, propane-butane gas, and coals. Soon the oil products have been added to this list but in June, 1991 they have been dropped out from the commodity group having fixed prices. The increase of fixed prices compared to their previous level has been differentiated according to the final consumer. The newly fixed prices have been increased from 4 to 14 times while using the products assigned to meet the economic needs and between 3 and 7.5 times when referring to households. Consequently, the fixed prices of electricity, thermal energy, and coals have been increased with 70% since June, 1991 and again between 25 and 60% for the separate products in May, 1992.

**2.2. Limited prices.** They have become operational since June, 1991 and are a further step on in the liberalization of prices of oil products (gasoline, diesel, mazut) and of liquid natural gas. The level of these prices serves as a top limit of the particular contractual prices. Price limits are defined on the basis of the average international prices of the indicated products and BGL average exchange rate. To thus formed BGL equivalence trade discount limits, ranging to 8% of the currency and profit expenditures, excises, tariffs, import taxes, and other fuels' payments are added. The fuel price limits were first calculated on monthly basis, and since December, 1991 - every 15 days .

**2.3. Forecasted Prices.** Introduced in February, 1991 they are aiming at controlling the prices of goods and services of common use. The list has firstly included 14 goods and services but their number has gradually declined. In August the tariff rates referring to different kinds of transport have decreased and the goods which are under government control have declined to 7 since May, 1992. The original forecasted prices have been thrice corrected by the mid 1992: in June and in August, 1991, and in May, 1992. In contrast to the price limits, forecasted prices can be exceeded which makes their control functions less efficient. Prices of the essential commodities are an object of control only in case that they exceed the forecasted prices of these commodities. When the sale prices begin to exceed the forecasted ones, the actual prices must subordinate to the normatively established maximum efficiency based on full expenditures. The income received from its exceeding is considered illegal. In case that expenditures are proven to take place, no limits for the increase in prices exists. Despite their regular correction, as practice indicates, the real prices are systematically higher than the forecasted ones. For example, in the period between the two revaluations (from August, 1991 to May, 1992), the prices have gradually

exceeded the forecasted ones with 15%, and with 16% until June, 1992, after the correction from May. This means that the prices - subject of forecasting are relatively free and practically out of control.

**2.4. Minimum Procurement Prices.** They were introduced in July, 1991 for some basic agricultural products and aimed at stimulating their output. Their level serves as a lower limit in the contract prices between the organizations of producers and purchasers.

**2.5. Entirely Free Prices.** That group includes all remaining goods. Their prices freely respond to the goods and services demand and supply. Its range broadens more and more along with the gradual drop of some goods from the groups subjected to pricing limitations.

The current price policy affects price dynamics and to a large degree determines the inflationary processes during 1991 and 1992.

### **3. DYNAMICS OF PRODUCER AND CONSUMER PRICES DURING 1991 AND 1992**

#### **3.1. Producer Prices**

Dynamics of producer prices were estimated on the basis of indexes developed in AECD for the period January, 1991 - April, 1992 and later on - in NSI.

From the beginning of 1991 until mid 1992 producer prices increased by 4.5 times. Only during the first months after the price reform was introduced (February and March) they increased by 148%. The indexes indicate a further increase in the producer price level until August, slight drop during September-October, and a new increase which continues until the end of the period in question. During the first period of increase (April-August) producer prices rose by 51.7% and in the second period - their increase slowed down, though it continues to be high, and from October 1991 until June 1992 price level increases with another 30.7%.

Significant changes occurred in the structure of the relative producer prices. The prices of the "first echelon" industries (Electricity and Heating, Coal Industry, Ferrous and Non-Ferrous Metallurgy), which production was systematically undervalued in the past, register a sharp rise within the range of 5-10 times. Contrary, Machinery and Fabricated Metal products, and Electrical and Electronic Equipment prices, which were artificially high before the reform, indicate much lower increase compared to the industrial average.

According to producer price indexes, calculated by the NSI on "change in price level effect" basis, producer prices for the first nine months of 1991 (compared to the same period of 1990) had increased by 282%. The main contribution (about 80%)\* for the registered increase have the materials used in industrial production\*\*. This is due to their high relative share in the current expenditures structure, as well as to the higher increase in materials' prices for the first nine months compared to other expenditures. The increase in materials' prices, calculated on "change in price level effect", is more than four times. The fuels' price index is 859.5%, and raw materials' one is about 400%. As a result of the different inflation rate, the share of fuels in the total material expenditures increases from about 7% to 15.6%. The raw materials maintain their basic share. There is a sharp increase in material expenses in the overall structure of expenditures (from 72.06% in 1990 to 79.59% during the first three quarters of 1991). Wages' share in the current expenditures decreases from 11.34% in 1990 to 7.69% for the first nine months of 1991.

The average annual producer price index for the whole 1991 is 396.39%. Some significant differences are observed in comparison to the first nine months.

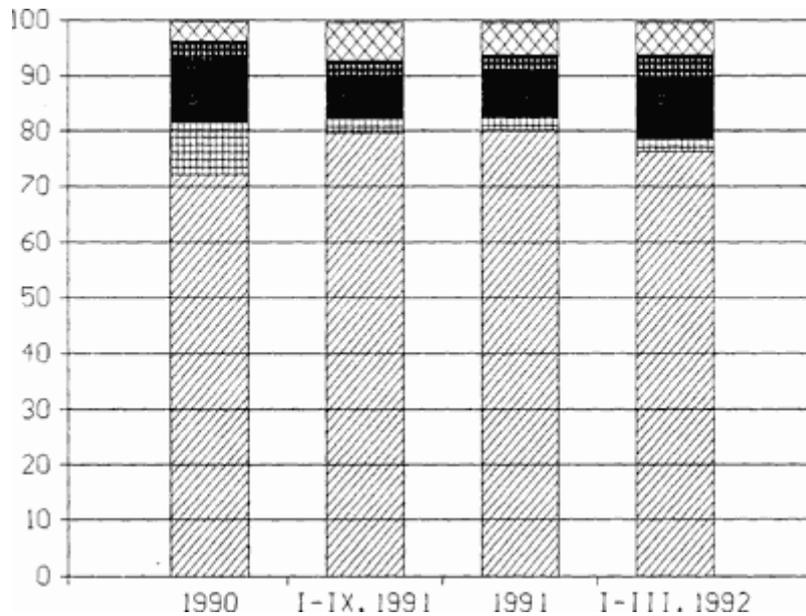
At annual basis, the contribution of used materials prices to the total increase in the price level decreases (by approximately 8 percentage points). This is due to the surpassing rate of increase in labor prices and other expenditures at the end of 1991 compared to the invested materials.

\* Due to the above described defects of "change in price level effect" indicator, assessments for some tendencies could be done, though without guaranteed exactness of their quantitative measurement.

\*\* Included are raw materials and metals, fuels, energy, and other material expenditures.

During 1991, the average annual increase in wages was 170% (and as of the end of the first nine months - by 137%). The quick nominal (in some months real) increase in wages, during the last quarter of 1991 and at the beginning of 1992, reflects in their increasing share in the industrial current expenditures structure.

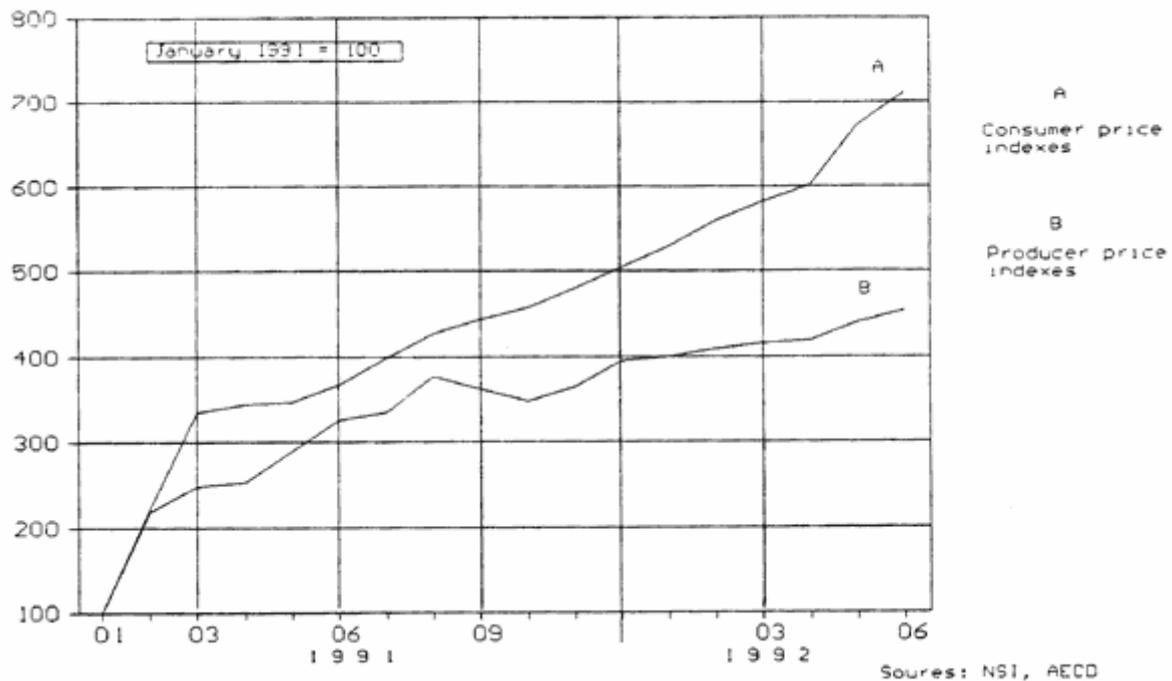
### Structure of Expenditures in Industry



Despite the wage increase at the end of 1991, it still has a slight effect on the total increase in producer price level throughout the year - only about 7% of it was due to the wages increase in the industrial sector.

### CPI dynamics and PPI dynamics

CPI dynamics and PPI dynamics



Soures: NSI, AECD

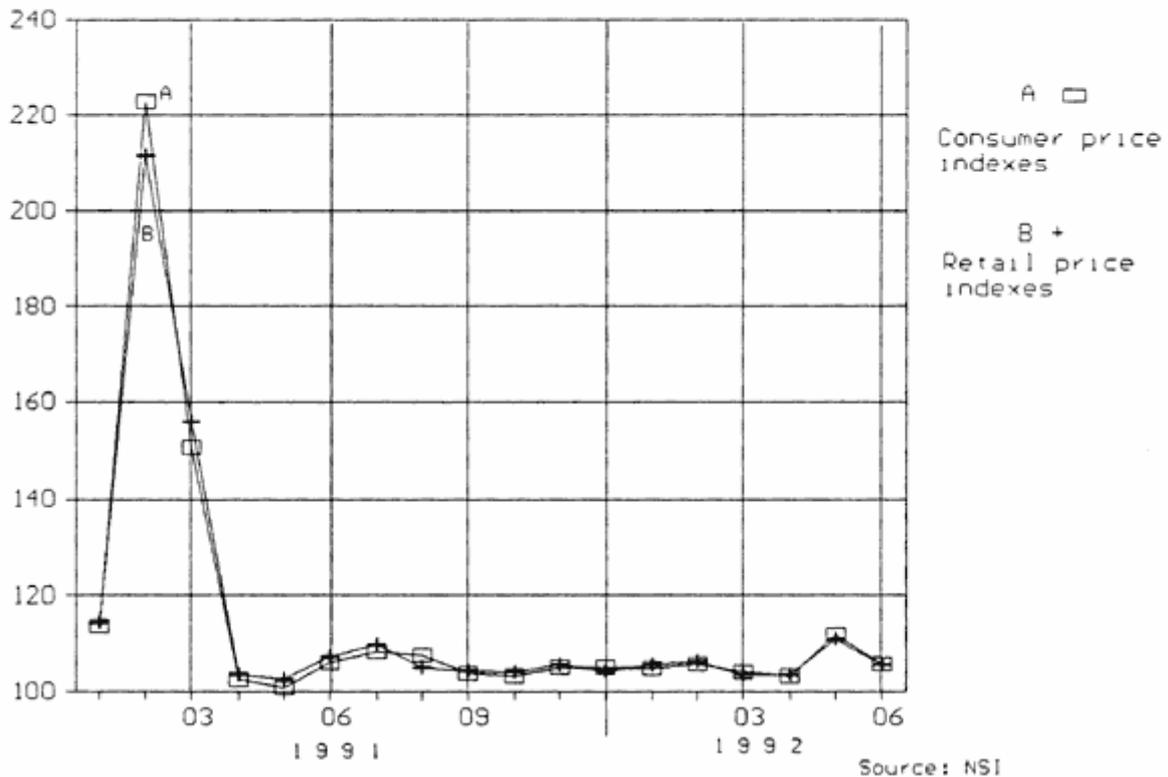
As it could be seen on the graph, the total producer price level has increased less compared to the consumer prices. The initial price shock has mainly affected consumer prices, from April to August PPI fluctuates increasingly compared to consumer price index, and then they begin to diverse. Some industries manufacturing goods and services for personal consumption could be juxtaposed the producer and retail prices dynamics. There are substantial differences between the production and consumption prices, which indicates that mediators have a significant contribution in defining the final price level. However, this does not mean that producers did not take advantage of inflation, as traders did. Practically, the price processes occurring in production and consumption spheres have a certain autonomy. Producers do not only sell, but buy on prices, different from consumption prices, so the final result is a product of the developments in the relative prices and production efficiency.

### 3.2. Consumer Prices

The consumption and retail prices are very similar in their tendency to change. The differences between them consist in different weight that food and non-food products have in defining the total price indexes. The change in the prices of food products is of biggest importance for CPI dynamics (their weight in CPI is close to 47%). However, food products represent only 24.6% of the turnover which is used in calculating the RPI. The prices of non-food products have the biggest part in the formation of the RPI (58% of the turnover of goods and services in 1990). That is why, the CPI surpasses the RPI exactly in those cases when food products prices increase faster than the remaining groups of goods. As a result, the CPI was higher than the RPI in February, August, December 1991, and March and May 1992.

Chain consumer price indexes and retail price indexes

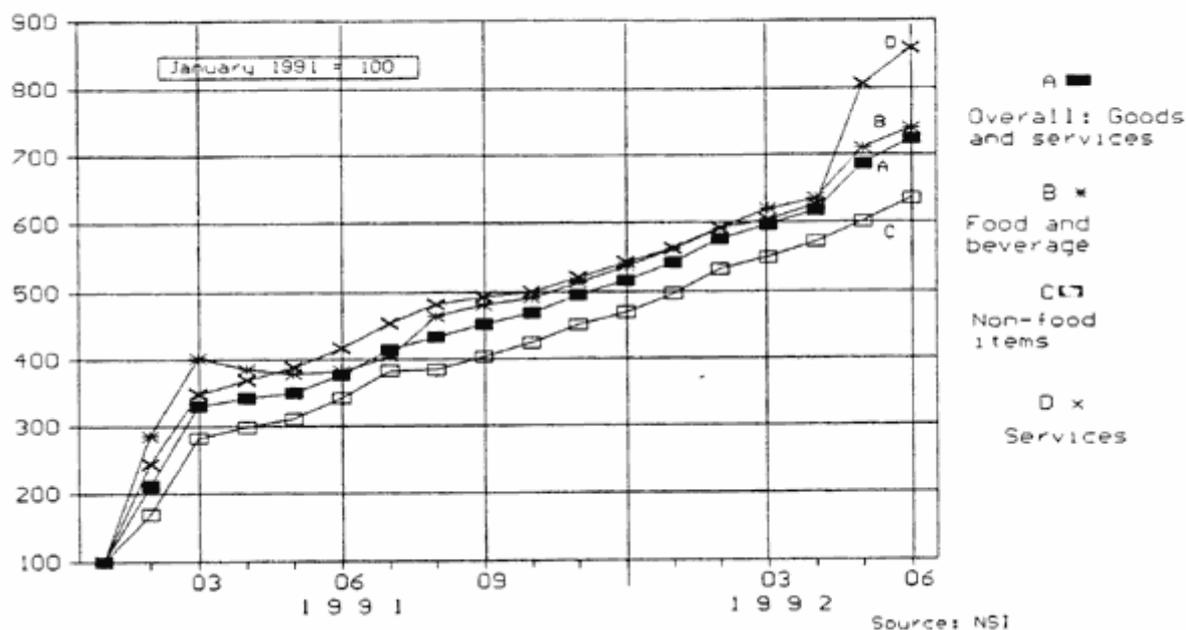
Chain consumer price indexes and retail price indexes



From the beginning of 1991 until mid 1992 the overall price level increased by more than 8 times. The price shock at the beginning of 1991 resulted in large scale inflation - only in March and April consumer prices increased by 235.5% and retail prices - by 229.6%. After a period of relative stabilization the inflationary processes "blew up" again during the summer months when a new, though much weaker, inflationary wave spread following a change in the price system - for 3 months the prices went up by 23.4%. If the shock period is eliminated, the average monthly increase in the price level during 1991 is 4.65%. In May 1992 prices increased again by 11.9%. If this price shock was ignored, the average monthly increase in price level for 1992 is 4.68%, i.e. the high inflationary level from the previous year remains. Prices of food, non-food products, and services have different dynamics and thus their effect on the RPI is also different.

#### Retail price indexes

Retail price indexes



Source; NSI

**Prices of food products** registered the highest and sharpest increase during the price "boom" from the beginning of 1991 (only in February by 185.6%). In few months during the observed period (February, August, December 1991, March and May 1992) their dynamics is surpassing in respect to the average price level increase, however, in February and August the increase in food products' prices is far above the average one. Their level increases by 375.8% at average annual rate, which is by 41.6 percentage points above the average growth. The outlined tendency in relative prices, along with the imposed minimum procurement prices, appeared favorable to farmers. However, if the price shock is excluded, after March 1991 until mid 1992 the prices of food products fall behind the average increase (indexes 184.8% versus 219.5%).

From February 1991 until mid 1992, the prices of such an important groups of goods as: bread and bread products, meat products, butter, milk, cheese, and baby food increase by more than 9 times, having an average increase of food products' prices by 640.6%. These groups make up close to 1/3 of food products' turnover.

**Prices of non-food products** have a decisive importance for retail prices dynamics. During the biggest part of the period, non-food products' chain price indexes are higher than the total RPI, but their values are very close to it. The biggest deviation in upward direction is observed in June and July. In this period gasoline and diesel prices, which make up about 10% of the non-food products turnover, were released. Until mid 1992 their increase is smaller than the increase in non-food products as a whole (gasoline price index - 388% and diesel - 488%). During February and August 1991, and May 1992 (the periods with the highest inflation) the prices of non-food products lagged behind the average increase in prices. During 1991 they increased by 292.6%, i.e. increase by 51 percentage points slower than general price level. If the price shock effect is eliminated, the prices of non-food products surpass the average increase (indexes 225.9 versus 219.5).

Since the beginning of reforms the **prices of services** increased mostly (by 757.7%). During the initial price shock from February and March the adaptation of services prices, as well as these of food products, caused an increase of these retail prices higher than the average one. A very high increase (by 28.5%) in the value of service activities was registered in May 1992. The registered peak points in the growth of services' prices, could be attributed to a large degree to the new fixed electricity and heating prices. The highest increase in prices until mid 1992 took place in air transportation (12.6 times), heating (11.7 times), electricity (9.3 times), communication services (13.2 times). They make up 27.6% of the total services value. Even if the period between February and March is excluded, the value of services continues to increase at faster rate compared to the average one (indexes 247.2 against 219.5%).

During the observed period a similar changes in the relative prices occurred in the overall structure of consumer prices. The highest price increase was registered in the following spheres:

housing, home furnishing, postal services, and food products. After the first two months of the price reform, food products drop out from the group with price increase higher than the average one (indexes 192.7 against average 211.85).

#### **4. CONSEQUENCES OF PRICE LIBERALIZATION**

Inflation during 1991-92 resulted in decline of real incomes, devaluation of savings and debts to banking system, decline in demand, output, and employment. The character of the inflation could be defined as "cost-push" inflation\*.

\*The conditionality in distinguishing between "cost-push" and "demand-pull" inflation is well known. The existing until-1991 prices, entirely defined by administrative means and hidden inflation demand, could be considered the main cause for manifestation of cost-push inflation, i.e. the cost-push inflation is manifestation of the grounded from the previous economic system demand-pull inflation.

The heavy burden of inflationary processes was taken by the households. Price liberalization during 1991 and restrictive income policy led to a sharp decline in population's real income. While prices increased at average annual rate of more than 4.3 times, incomes increased nominally by approximately 2.5 times. As a result, during 1991 the real disposable income decreased by 42% compared to the previous year. Wages decreased even more - by approximately 50%. It was due to the increase in unemployment (by 16.5%), as well as to the decline in real wage (by 42.4%). The transition to negotiated wages after August 1991, as well as the appearance of new sources of income, led to a relaxation of the income restrictions at the end of 1991 and the beginning of 1992.

The increase of interest rate in 1991 was not enough to compensate the inflation and to preserve the real savings. Throughout the biggest part of 1991 and until mid 1992 the real interest rate on deposits was negative. From February 1991 until June 1992 inflation devaluated not only the accumulated interest on deposits, but 74.8% of the deposits themselves. This fact, though not very clearly expressed, is observed even if the price shock months (February and March) are excluded. From April until the end of 1991, the inflation has "destroyed" 9% of the nominal deposits, and until mid 1992 - another 12%. Population reacted to the devaluation of savings by restructuring its savings into time deposits which bring higher interest. The lower degree of

liquidity of time deposits' assets additionally relaxed the inflationary pressure on domestic market.

The inflationary processes were favorable to all debtors in the economy. The **state budget's** national debt was highly devaluated. It decreased from 35% of the GDP at the end of 1990 to 16% in 1991. As a result of the transition to market pricing system, the volume of subsidies\* sharply declined, which in turn decreased budget expenditures.

**Enterprises-debtors** also took advantage of the increase in prices since their debts to banking system devaluated. The real interest rate on new credits granted to producers until the middle and during the last two months of 1991 was negative which is equivalent to a specific subsidizing of enterprises. In spite of this, the main part of producers are unable to repay their credits. One of the major reasons is that a growing number of enterprises have difficulties in realizing their production because of the decline in aggregate demand. This, in turn, determines the continuing decline of economic activity\* \*. From the beginning of 1992 the interest rates on credits granted to producers are positive which additionally aggravates the problems with enterprises solvency.  
\* Currently, subsidies are only granted for production of goods which prices are fixed.  
\*\* In 1991 the GDP, in real terms, declined by 16.7%, and during the first half of 1992 compared to the same period of last year - by 12.6%.

Price liberalization, high interest rate, and restrictive fiscal and income policies brought about a decline in the aggregate demand and reduced the inflationary pressure. In spite of this, the inflationary potential is still grounded in the Bulgarian economy due to limitations in the pricing of some goods which prices are not determined by free market principles.

The BNB financing of a substantial part of the budget deficit, the further adaptation of wages to the high prices level, as well as the forthcoming resumption of external debt payments - all this in a condition of continuing output decline - add to the list of the potential sources of inflation. Because of the prolonged high monthly inflation rate, the inflationary expectations of both producers and consumers remain unpaid. The threat that increase in prices in Bulgaria could assume inert character still exists.

Because of non-exhausted inflationary sources, the official estimates of 63% inflation rate at the end of 1992 seem unrealistic. Only until mid 1992 prices have increased by 40.8%. This means that the average monthly inflation rate should not exceed 2.5% until the end of the year, which is hardly to be achieved. The 63% inflation rate until the end of 1992 could be achieved, but at the expense of postponing the next step in price liberalization, which will put off the impact of the inflationary impulse only temporarily. In this sense, an estimate of about 75-80% inflation rate at the end of 1992 seems more appropriate.