

# METHODOLOGY AND RESULTS

## PRODUCER PRICE INDEX IN BOSNIA AND HERZEGOVINA



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## Foreword

In the process of accession to the European Union and harmonization with the EU standards and practice, the statistical system of BiH is expected to harmonise its activities with the requirements of the European Statistical System. The transition period is characterised by significant changes in politics, legislation and economic system and it demands adoption of new statistical standards and methods. Accordingly, the statistical system has to ensure high quality and timely following the changes occurring in the new circumstances and to allow international comparison of statistical data. The objective of the CARDS Twinning Project “EU Support to the Statistics Sector of Bosnia and Herzegovina- Phase III”, funded by the European Union, was to support Bosnia and Herzegovina in carrying out this important obligation.

In the scope of aforementioned Project, Component “Business Statistics” with Sub-component “Producer Price Index“ was implemented. Publication “Methodology and results – Producer Price Index in BiH” is result of the joint efforts of experts from Italian National Institute of Statistics (ISTAT) and three statistical institutions from Bosnia and Herzegovina.

We would like to express our gratitude and thanks to the European Union, the Delegation of European Commission to Bosnia and Herzegovina and Eurostat for their efforts in the implementation of this project and providing financial, administrative and technical assistance.

Furthermore, we would like to express our special thanks to the expert team from the Italian National Institute of Statistics – ISTAT, led by Mr. Gian Paolo Oneto, Team Leader of the Component “Business Statistics”, for their open and professional efforts to contribute to the development of new methodology compliant with European standards, and designing the IT tools for producer price index compilation.

Special thanks go to Ms. Cecilia Pop, Resident Twinning Advisor, and her team for highly professional and committed support to the BiH statistical system.

We are very glad to offer to all our users the Methodology for compilation of BiH producer price index in line with the EU standards and regulations.



## **Introduction**

The Producer Price survey in Bosnia Herzegovina (BiH) is carried out by the Entities (Federation of Bosnia Herzegovina, FBiH, Republika Sprska, RS, and District of Brcko) through a common set of methodologies and a software tool. Both the methods and the software were released by the Italian statisticians during the cooperation activities. The contents of the presentations and the software setting up work were agreed among the experts of the Italian and Entities teams. The same set of tools ensures homogeneity in data production. Of course, each Entity carries out its own survey independently from the others.

The BiH producer price index is the short-term statistical indicator that shows the dynamic of transaction prices of goods among enterprises, within each Entity and among them (State level indices). After data collection, the PPI compiling procedures start with the synthesis (via simple geometric mean) of price relatives (ratios between current and basic prices) up to the overall index (Laspeyres aggregate indices). As a result of the cooperation project, methods and techniques are in line with the European standards.

The Producer Price survey is carried out by updating, annually, a sample of products and the linked list of enterprises, whose updating depends on the business register provided by the Institute of Statistics. The chained index structure allows to manage a continuously representative sample of units (products and enterprises) and the corresponding follow-up in terms of (good) quality of the estimates (indices).

One of the crucial tasks of the cooperation activities was the identification of a common period to refer elementary prices, indices and weights. This point presented a very high priority in the development of a new survey at state level: the Entities agreed on providing a monthly data set for the period December 2006 onwards, both for the elementary data (quotation prices) and weights.

Concerning the final results presented here, the limited length of the data collection period (December 2006 – June 2008), allows to have a short spectrum of monthly indices with their rates of change (respectively, for the month to month and the twelve-month rates of change, 18 and 6 ratios). Such a set of indices is rather short for carrying out a detailed data analysis, but its information content is sufficient to show that the sub-component on PPI has entirely achieved its aim. On the other hand, the situation at the beginning of the technical assistance activity was such that only one Entity provided producer price indices, but the survey architecture was not in

line with Eurostat standards. Surely, the software release, was a major contribution to the success of the Sub-component. This application has played a central role in allowing the Entities to manage effectively the survey. In fact, the results contained in this publication are also based on the desk work the Entities carried out by using the first software release (therefore, after the end of the last meeting), purposely set up by the Italian team experts.

The present publication is not a review of theoretical tools or a survey manual on PPI. Rather, it is a manual of survey practices with a twofold aim: to have the users acquainted with new methods to be adopted in setting up the survey and the index numbers compilation; to show the final results of the cooperation work. It's worth noting that all final results are based on the elementary data as they were provided by the Entities and on a complex set of quality check operations (carried out by the Italian statistician in the desk work session) on these elementary data based on hypothesis the Entities experts shared.

This volume is made up of three chapters. The first one, Methodological topics, concerns survey methodologies and techniques considering all the main themes treated during the project. The second chapter, BiH producer price indices, discusses the results of the cooperation work, focusing on the quality check work. Graphics and data tables in the Appendix complete the presentation of results. Finally, the third chapter, Software Users Guide, presents a shortly description of the software release performances. Within the IT section, training course meetings for the Entities statisticians were carried out. Such training on the job experiences allowed the Entities experts to manage the software providing indices for the period January – June 2008.

The present Final Report, coordinated by Valerio De Santis, is a team work. In particular, contributes were provided by Valerio De Santis (paragraphs 1.1 – 1.4, 1.6 – 1.8, 1.14, 2.2 and the Glossary), Francesca Monetti (paragraphs 1.9 – 1.11, 2.1, 2.3 and annex - statistical tables), Tiberio Damiani (paragraphs 1.5, 1.12, 1.13, 2.1, 2.3 and annex - statistical tables) and Massimo De Cubellis (Chapter 3).



## 1. Methodological topics

### 1.1 Preliminary remarks

The content of these methodological notes focuses on the main topics of the producer price indices as they were shown during the meetings held in Sarajevo and Banja Luka. The technical assistance activities concerned the following topics:

- main criteria for the selection of products and enterprises;
- definition of elementary items;
- definition of transaction (producer) price;
- applied chain indices topics;
- desk work on quality checks;
- desk work the estimation of weights.

Elementary (producer) prices in BiH are collected directly by the enterprises. The respondents are required to fill in the survey questionnaire, specifying the main items of their production that are coherent with (the denomination of) the product provided by the NSI. The index compiling procedure links products, items and enterprises. Products and enterprises are selected by the NSI, while the items are selected by the respondents. Given a generic product, its corresponding index is calculated by making a synthesis (via the simple geometric mean) of the item prices monthly collected. In fact, the simple geometric mean is compiled on the price relatives or micro-indexes; a price relative is, by definition, the ratio between the item price at the current time and its level at time  $t = 0$  (the item price of December of the previous year, if the index is chained, or the average of the twelve months item prices of the basic year when the index is a fixed base one). Therefore, the overall index is the result of summarising the information set derived from  $N$  enterprises providing (monthly)  $M$  item quotation prices corresponding to  $K$  products (in terms of NP PRODCOM). The relationship among these entities is such that the following always holds:

$$[1] \quad K < N < M$$

Of course, the main index base criterion is that the number of items and products (respectively  $M$  and  $K$ ) must be kept fixed for all the period in which the (calculation) base holds. In theory,

the number of enterprises could change (enterprises replacement) during the year but when indices are chained the updating of the enterprises list is carried out once a year, so that such a need is not a priority outside the annual base updating procedures.

The results of the activities can be summed up considering the overall PPI surveys profile in terms of products, items and enterprises (Tables 1.1 and 1.2). These results are net of the quality check<sup>1</sup> work carried out by Italian and Entities experts.

**Table 1.1 – BiH analysis and reporting units**

Year 2007	BiH	FBiH	RS	DB
Products(*)	449	265	294	27
Items	2570	1600	929	41
Enterprises	528	241	277	10

(\*) 8 digit Products

**Table 1.2 – BiH analysis and reporting units**

Year 2008	BiH	FBiH	RS	DB
Products(*)	438	258	288	28
Items	2542	1586	914	42
Enterprises	529	242	277	10

(\*) 8 digit Products

### *1.2 Producer price definition*

The producer price is the transaction price between two enterprises: the dealer (producer) and the purchaser. From the PPI survey point of view, the manufacturing enterprise who sells its products is the reporting unit. It's worth noting the difference between the terms product and item. The producer price excludes, by definition, VAT and excises.

The definition of product comes from the PRODCOM survey, while the item has to be specified by the enterprise or respondent unit. In the PPI survey questionnaire, the definition and code of

<sup>1</sup> The quality check work for the period December 2006 – December 2007 was carried out by the Italian statisticians. Consulting assistance was provided to the Entities statisticians for carrying out quality checks for the period January – June 2008.

the product is decided by the Institute of Statistics. The enterprise will choose the most representative goods (items) in its own manufacturing process and will transmit monthly their prices. The items must not be tailored manufacture because in this case their prices would be unique prices, not comparable in time. In fact, the aim of the survey is to measure the (monthly transaction) price development by maintaining as much as possible fixed the transaction conditions. Transaction price refers to transactions that take place in the reference month.

Reporting unit are requested to provide the Institute of Statistics with (item) producer prices referring to their main goods. The enterprise singles out the main items of its manufacture and transmits their prices concerning the most significant transactions (in terms of turnover) that took place in the reference period (contracts drawn up regarding orders booked during the reference month). A good practice is to choose, for each item, the main transaction that took place during the reference month and transmit its corresponding producer price. Therefore, supposing N orders booked during the reference month for the same item singled out by the enterprises, the price collected has to refer to the main (among N) transactions that took place during the reference month.

The term “actual” used above, means that the transaction price includes discounts, rebates and surcharges. This means that respondents have to identify their items keeping in mind that price quotations can vary over time, and that the contract conditions have not to affect price quotations level. In other words, the survey is intended to measure the pure price variation. For this reason, it is foreseen that the price determining characteristics can change over time. When changes occur, price change has to be adjusted somehow in order to identify the true (pure) price variation.

### *1.3. Price determining characteristics*

The price determining characteristics are a set of conditions that affect the transaction between producer and purchaser and the (item) price. When one or more of the following price determining characteristics

- physical characteristics (quality) of goods;
- unit of quantity;
- measure unit used;

- payment and delivery conditions (payment, packing, transport costs).

change, the reporting unit has to eliminate their effect on the item price. The reason for such quality adjustment is to measure only the pure item price by removing any other element that could affect its level.

Furthermore, there are other cases that can be treated by adopting a quality change. In fact, a quality adjustment may also occur when:

- i) a commodity (item) ceases to be produced (and the observation unit is able to replace it with a new item);
- ii) an enterprise A ceases its (manufacturing) activity and if its substitution with a new one (B) is possible, the new enterprise B enters in the list of respondents with its own items. These will replace the items of the ceased enterprise A.

Technically, the standard method used worldwide for managing quality adjustments is the well-known overlap algorithm. How does the overlap work? Let's suppose the reporting unit m stopped the production of the item  $i=1$  since month  $m-1$  onwards. At time  $m$  its item price quotation refers the new item  $i=2$ . This situation may be better analysed by the following three tables where prices, price relatives and rates of change are reported. Table 1 shows the price quotations of a couple of items, the item 1, whose manufacturing is supposed to be ceased and the (substituting) item 2. Table 2 focuses on the corresponding price relatives or micro-indices. Finally, Table 3 shows the price relatives rates of change before and after the month  $m$ .

**Table 1.3.1 – Quality change: item prices**

Items	Year (y - 1)			Year (y)		
	m = 12	...	m - 1	m	m + 1	...
Item 1	$P_1^{y-1,12}$	...	$P_1^{y,m-1}$	-	-	...
Item 2	$X$	...	$P_2^{y,m-1}$	$P_2^{y,m}$	$P_2^{y,m+1}$	...

**Table 1.3.2 – Quality change: price relatives**

Price relatives	Year (y - 1)			Year (y)		
	m = 12	...	m - 1	m	m + 1	...
Micro index 1	$I_1^{y-1,12}$	...	$I_1^{y,m-1}$	-	-	...
Micro index 2	-	...	$I_2^{y,m-1}$	$I_2^{y,m}$	$I_2^{y,m+1}$	...

**Table 1.3.3 – Quality change: month to month price relatives rate of change**

Rate of change	Year (y - 1)			Year (y)		
	m = 12	...	m - 1	m	m + 1	...
index 1	$D_{y-1,11;1}^{y-1,12}$	...	$D_{y,m-2;1}^{y,m-1}$	-	-	...
index 2	-	...	$D_{y,m-2;2}^{y,m-1}$	$D_{y,m-1;2}^{y,m}$	$D_{y,m;2}^{y,m+1}$	...

In Table 1.3.3, for instance,

$$D_{y,m-1;2}^{y,m} = \frac{I_2^{y,m} - I_2^{y,m-1}}{I_2^{y,m-1}}$$

is the monthly rate of change of the item 2 (or, better, the rate of change of its micro-index). The unknown variable in the present context is the calculation base for the new item (item 2), the replacing one that will substitute the old item 1 (because, for instance, no more manufactured and/or sold) from that time onwards. This means the denominator of the price relative of the item 2 has to be estimated.

For the estimation of the unknown term, the algorithm of the overlapping is the most used at international level. The unknown variable is estimated by stating the following proportion

$$[1] \quad p_1^{y-1,12} : x = p_1^{y,m-1} : p_2^{y,m-1}$$

so that the solution is

$$[2] \quad x \equiv \widehat{p}_2^{y-1,12} = p_1^{y-1,m} \times \frac{p_2^{y,m-1}}{p_1^{y,m-1}}$$

If  $p_2^{y,m-1}$  is unknown, the survey practice suggests to pose  $p_2^{y,m-1} = p_2^{y,m}$ . This hypothesis involves that, looking respectively at Tables 2 and 3,  $I_2^{y,m} = 1$  and  $D_{y,m-1;2}^{y,m} = 0$ .

#### 1.4 Sample design topics

The producer price survey is based on a sample of products and involves a list of “producer” enterprises, i.e. manufacturing units whose plants are located within the national borders and whose products are sold on the domestic market. In BiH the products are identified by the national version of the PRODCOM classification i.e. the PRODCOM NP at 10-digits. Elementary data (item prices) are collected by the Entities (FBiH and RS) and the District of

Brcko (DB). At state level, the Agency for Statistics (BHAS) collects a monthly set of elementary product indexes and provides users with aggregate indices at state level. Elementary product indexes are compiled firstly at 10-digit and then at the 8-digit level. Therefore, in the longitudinal structure of the PPI, there are two product aggregates with their own indexes; this characteristic has been maintained and allows the Entities to use their (old) “national” PRODCOM classification.

A major work developed during the project has been the definition of the data collection elementary unit. The item is a specific product: its identification is provided directly by the respondent unit (the enterprise), when it fills in the form for the first time. In other words, the respondent “adjusts” the product definition provided by the NSI to its own manufacturing process. The outcome is the identification of one or more “appropriate” (in the sense of the PRODCOM definition) items whose prices will be monthly surveyed.

The survey questionnaire, in fact, merges products and manufacturing enterprises. Among the goods manufactured, the enterprise chooses those items that are “representative” of its production in terms of the product definition assigned by the NSI. The PRODCOM list is drawn by the structural (annual) business survey and its questionnaire is identified as model IND21 for both the Entities.

In the PPI applied context, the technique for sampling products and industries is always a compromise between methodology and practice. Products are generally sampled firstly; then, once the basket of products has been defined, the list of enterprises is selected through the business register.

The PRODCOM NP list provides the population of products manufactured, i.e. for each code of the classification it gives the value of production sold. It’s worth noting that this information (coming from the annual industry survey, model IND-21) usually does not allow to make a distinction between goods (manufactured) sold on domestic and non-domestic market (this information depending on the level of detail of the annual questionnaire). Then the domestic value of production sold has to be somehow estimated (i.e. using an appropriate algorithm).

What allows to merge products and enterprises is the nested criterion of the classification used. The NACE classification is made up of 8 digits: the first four digits identify the (main) kind of economic activity (class level), while the last four ones provide the product identification. The BiH list of products is made up of 10-digit: the last two characterise the inventory of product in the national version.

The Table 4 shows, in a very synthetic manner, the sampling procedure carried out once a year when the index is chained.

**Table 1.4.1 – Sampling activities**

STEPS	ACTIVITIES
Step 1	identification of the products population
Step 2	definition of the products sample
Step 3	identification of the reporting units population;
Step 4	definition of the enterprises list
Step 5	joining the products sample and the enterprises list
Step 6	data collection operations
Step 7	definition of the actual samples of products and enterprises

The main criterion for reducing a population vector to a sample one is to maintain fixed the total amount of values so that what actually is reduced is the number of units.

Each item within its population (and after sampling, in its theoretical sample) has its own (absolute) weight: when the item is a product, this weight is the PRODCOM value; when the item is an enterprise, this weight is the turnover (sales of manufactured goods). The relative weight is given by the ratio between the (absolute) value and the sum of all items values. Therefore (by construction) the sum of all the relative weights is 1 or 100 (it depends on the adopted scale for deriving the weights relative). Whatever sampling method used, the reduction to the sample implies a weight collapsing procedure so that in terms of absolute (and relative) values (weights), the sample sum matches with the population one. After sampling, in fact, we



distinguish between sampled and non-sampled units; the weights of these last have to be reallocated among the sampled units. For this reason the weights reallocation does not affect the sampling technique used.

### 1.5 Weights system

This paragraph deals with the applied procedure for deriving the weights system for BiH. Such a procedure has two phases: the first concerns the definition of three vectors of weights, one per Entity (FBiH, RS and DB), directly drawn by the structural business statistics (SBS) source (data coming from the form IND-21). The second phase consists in setting up the system of weights at state level, by joining the three vectors in terms of a weighted arithmetic mean. So doing, the weighted system is, in terms of a nested classification, a coherent set of values. Of course, the weighted arithmetic mean is based on the absolute values of the Entities' weights, while the producer price indices are always compiled using the weight relatives. Therefore, starting from the absolute values of weights, within each Entity the weight relatives are ratios (or coefficients) between the absolute values of an aggregate A and the total value of all the aggregates of the overall index. The weight of an aggregate at state level is equal to the sum of the absolute values of the Entities weights. The weight relative, for a given aggregate, for BiH is defined by the ratio between the absolute value of the aggregate and the sum of the values of all the aggregates. To sum up, let's consider a generic aggregate A such that  $W(A|FBiH)$ ,  $W(A|RS)$ ,  $W(A|DB)$  are the absolute values of its weight in each Entity. Then, the following equations hold

$$[3] \quad w(A|FBiH) = W(A|FBiH) \div \sum_A W(A|FBiH) \Rightarrow \sum_A w(A|FBiH) = 1$$

$$w(A|RS) = W(A|RS) \div \sum_A W(A|RS) \Rightarrow \sum_A w(A|RS) = 1$$

$$w(A|DB) = W(A|DB) \div \sum_A W(A|DB) \Rightarrow \sum_A w(A|DB) = 1$$

$$W(A|BiH) = W(A|FBiH) + W(A|RS) + W(A|DB)$$

$$w(A|BiH) = W(A|BiH) \div \sum_A W(A|BiH) \Rightarrow \sum_A w(A|BiH) = 1$$

Within each Entity, producer price indices are compiled using the own vector of weight relatives. This is true for the state level too but the weight relatives are defined after summing the Entities' absolute (aggregates) weights.

In BiH (and in the Entities too), the hierarchical architecture of the classification of products is made up of seven aggregates

**Table 1.5.1 – BiH national products classification**

LEVELS	AGGREGATES
10-DIGIT	NP PRODUCT
8-DIGIT	PRODCOM PRODUCT
4-DIGIT	NACE CLASS
3-DIGIT	NACE GROUP
2-DIGIT	NACE DIVISION
2-LETTER	NACE SUB-SECTION
1-LETTER	NACE SECTION
-	OVERALL

The “nested” structure of this classification allows to manage the overall weight of products at any level of aggregation. In other words, for the equations [3] it always holds that given a level of aggregation, say A, the sum of the weight relatives is 1.

As concerns the weights source, in F BiH, RS and DB the main one is the annual industrial survey. Both PRODCOM and the structural business statistics are contained in the form IND-21. The advantage of using the SBS statistics is first and foremost that data are generally consistent among Member State, since they are based upon the Council Regulation on Structural Business Statistics. PRODCOM data are arranged with SBS data: the sample of products is firstly based on the information derived by this source. Secondly, from the SBS source, the aggregate at 4-digit level (classes) are selected. For merging the products values (in terms of PRODCOM) and those of the classes (SBS), the products weight relatives within classes are calculated. Then, the value of any class is detailed at product level, using the weight relatives calculated above. Such a procedure allows to define a coherent and nested system of weights. The procedure can be summarized with this formula:

$$[4] \quad W_p = (\text{Prod}R_p / \text{Prod}R_c) * \text{SBS} T_c$$

where:

$R$  = classes weight from Prodcom source;

$T$  = classes weight from SBS source;

$W$  = product weight.

The main benefit of this choice is that it maintain the data configuration of the SBS classes preserving the class's structure fixed from the Prodcom source. The SBS variable used to determine the PPI weight system is the domestic turnover.

#### *1.5.1 Theoretical and actual weights system: the problem of the redistribution of weights*

The basic concept of sampling (product and enterprises) is that while the sample contains a reduced number of units (compared to the population) in terms of total value associated to the reduced set of units, sample and population total values must be the same. Such a criterion implies the redistribution of the non-sampled units values. The same approach holds when comparing the theoretical sample and the actual one, i.e. the sample before and after the data collection operations (missing units).

Let us suppose that the aggregate A is one of the units in the (theoretical) sample (i.e. foreseen by the sample design) but not in the actual one. In terms of actual sample, the aggregate A is a missing unit and its corresponding value is a missing value. Such a situation implies the redistribution of the value of A among those included in the actual sample. The aim of redistribution is to maintain the total value of the actual sample equal to its theoretical design. The problem of how to redistribute the missing value of the (non-collected) aggregate A may be approached in a number of ways. In this context, it was decided to adopt the criterion of closeness in term of classification. In other words, if A is a missing product, its (theoretical) value will be redistributed among all the other products within the same NACE class. Therefore, given a generic aggregate, its place within the classification automatically allows the identification of the target (cluster) aggregates. From a practical point of view, three cases can be distinguished:

1. *More than one target cluster.* In this case the redistribution is made proportionally to their relative share of values according to a specific calculation described below;
2. *One target cluster only.* In this case the effective redistribution consists in adding the value of the missing cluster to the value corresponding to the target cluster;
3. *No target clusters available (cluster collapsing).* In this case the redistribution is made in the nearest upper cluster.

#### **Example 1.5.1 - Weight redistribution situation**

Let us suppose the Class 15.10 missing. Then:

Case 1:

if there is no cluster for NACE class 15.10 and in the group 15.1 there are two classes with products collected (class 15.11 and class 15.12), the weight of class 15.10 should be distributed between classes 15.11 and 15.12, not simply by assigning half of the weight to each of these two classes, but by dividing the weight of Class 15.10 according to the weight relatives of classes 15.11 and 15.12.

The index for Group 15.1 is then compiled from the adjusted weights of classes 15.11 and 15.12.

Case 2:

if there is no cluster for NACE class 15.10 and in the group 15.1 there is only one class with products collected (class 15.11), the weight of class 15.10 should be added to the weight of Class 15.11

Case 3:

if there is no cluster for NACE class 15.10 and this class represents the only class for group 15.1, the weight of class 15.10 should be added to the relative weights of the group 15.1.

The ratio between the value corresponding to a cluster and that corresponding to the hierarchical higher cluster is defined as effective cluster. The first step of the weights redistribution procedure is to calculate the relevant coefficients for all the aggregates. These coefficients represent the division's quota referred to a fixed aggregate. With reference to a generic aggregate, these coefficients will be a part of one cluster coefficient that represents the final division coefficient. This relevant coefficient represents the multiplicative factor that pairs with

the total value corresponding to all the aggregates. The result is a new recalculated value to be joined to the aggregate. After redistributing the weight system can be compiled.

From the lowest level (the class) the weight's coefficient is equal to the ratio between the value corresponding to the cluster's product (obtained as a result of the previous steps) and the total value of the products.

The final step consists in a further distribution of the weight estimates to the products within the classes according to the original ratio percentages of the classes' structure (class relative weight).

Finally the final weight is performed by normalizing the total value of the product equal to 1000000 (by multiplication of 1000000 with the weight's coefficients). The process called weight normalization is used to convert each set of original values into a standard scale. In this case the scale used is: total product values = 1000000. In the same way it is possible to calculate the normalized weight's coefficients on the upper aggregation level as indicated above about classes and their upper level of aggregations.

In this phase the total sum of the normalized weight's coefficients, referred at a certain level, could not be equal to 1000000, owing to rounding off problems. This is caused by the approximate method used to clustering 1000000, based on 1 unit digit (while in the previous phases we have planned an approximate method based on 15 decimal digits). In this case a put and takes technique has been used, based on the relevant of the product's aggregations, in order to adjust the normalized weight distributing the rest derived from the normalization.

#### *1.5.2 BiH weights estimation criteria*

For both the Entities, the data source is the annual survey on industry. From the Entities database the total sales values (at 10-digit level, NP PRODCOM) and the turnover values (at 4-digit level) were selected.

The first target was the estimation of the domestic product weights. Product weights can be performed by adjusting the products values by classes from the 10 digits database, according to the export's shares derived from the class aggregates, in order to take out the products domestic value of sales. The steps of the procedure are the following:

1. estimation of the classes' export share from the total sales at the 4-digit aggregates;

2. arrangement of the 10-digit aggregates by subtracting the export share estimated by multiplying the product values with the class values, calculated above, referred to the export sales;
3. definition of the share of the new product value on its own class;
4. arrangement of the new product weights by multiplying the ratio calculated at the previous step with the class value, referred to domestic sales, of the corresponding class;
5. final adjustment of the weight values at product level.

In details, the weights estimation criteria run as follows

Step1

From  $i=1$  to  $n$  ( $n$  = number of classes)

$$[5] \quad 4\text{-digits}C_{i(d)} = (4\text{-digit}T_{i(nd)} / 4\text{-digit}T_{i(tot)})$$

where:

$T$  = classes' weight;

$C$  = classes' domestic ratio;

Step 2

For  $i=1$  to  $n$  ( $n$  = number of classes) and  $j=1$  to  $m$  ( $m$  = number of products)

$$[6] \quad 10\text{-digis}R_{j,i(d)} = 10\text{-digis}R_{j,i(tot)} - (10\text{-digis}R_{j,i(nd)} * 4\text{-digit}C_{i(d)})$$

where:

$R$  = products' weight;

$C$  = classes' domestic ratio;.

Steps 3 and 4

For  $i=1$  to  $n$  ( $n$  = number of classes) and  $j=1$  to  $m$  ( $m$  = number of products)

$$10\text{-digit } S_{j(d)} = (10\text{-digit } R_{j(d)} / 10\text{-digit } R_{i(d)}) * 4\text{-digit } T_{i(d)}$$

where:

$T$  = classes' weight;

$R$  = products weight;

$S$  = new product value (10 digits).

Step 5

For  $j = 1$  to  $m$  ( $m$  = number of products)

$$10\text{-digit } \hat{W}_{j(d)} = (10\text{-digit } S_{j(d)} / \sum_j 10\text{-digit } S_{j(d)}) * 10\text{-digit } S_{j(d)}$$

where:

$S$  = new product value;

$\hat{W}$  = product weight (10 digits).

These product weights will be adjusted for the final estimation of the weights scheme. The main benefit of this choice is to maintain the frame data as it derives at the 4-digit level, preserving at the same time the products structure estimated at the 10-digit level. In this way, the estimates are obtained by a reasonable calibration of the information drawn both at 4-digit and 10-digit level.

As concerns the weights structure of the District of Brcko, the estimation procedure foresees two steps:

1. to find out, for all products, the share of the domestic product's value by subtracting the export share by division from the 4 digit;
2. to adjust these values according to the product ratios.

The final adjustment regarded the weights reference year according to the year related to the sources. Chained indices foresee the annual updating procedure for weights. This means that for

year 2007, the weights vector comes from year 2006, while for year 2008 it is derived by year 2007. Further, price relatives of year 2007 are referred to December 2006 and those of year 2008 are referred to December 2007.

For the District of Brcko data referred to 2005; two adjustments occurred under the assumption that the value of products rise such as the PPI percentage ratio from year to year. This adjustments consists in updating the final vector of weights from the previous year using a spread, calculated by NACE division, related to the percentage ratio of the PPI from the December of the current year to December of the previous year (equal to the weights' reference year).

Finally, the basket of products for the year 2008 was updated. Such operation was made possible by the desk work that Entities statisticians cancel out by using the software application. The results are the following:

**Table 1.5.2. - Products and items comparison 2007 - 2008**

YEAR	PRODUCTS			ITEMS			2008 FLOWS					
	FBiH	RS	Brcko	FBiH	RS	Brcko	IN			OUT		
	FBiH	RS	Brcko	FBiH	RS	Brcko	FBiH	RS	Brcko	FBiH	RS	Brcko
2007	368	397	35	1600	929	41	-	-	-	-	-	-
2008	358	387	36	1586	914	42	3	-	1	10	10	-

Furthermore, after performing the weight adjustment procedure, three normalized vectors of weights are obtained (one per Entity). The weights normalization “within” the Entities shows the weight relatives or the (weight) coefficients that are actually used for compiling the PPI indices.

The weights normalization “among” the Entities, i.e. the BiH vector of weights, derives from the sum, for any aggregate, of the absolute weight in FBiH, RS and DB. Then, there are set up the weight relatives (or weight coefficients) by dividing each aggregate absolute weight by the sum of all the absolute weights.



**Table 1.5.3 – PPI 2007 and 2008 weight relatives comparison. Main NACE aggregates per Entity.**

NACE main aggregates	FBIH		RS		DB	
	2007	2008	2007	2008	2007	2008
Total	1000000	1000000	1000000	1000000	1000000	1000000
C	125064	124500	99650	111223	-	-
CA	108576	107638	68078	81196	-	-
CB	16488	16862	31572	30027	-	-
D	697551	709197	589056	589098	1000000	1000000
DA	254915	259695	174766	187584	926929	942182
DB	4893	4738	9165	8707	-	-
DC	2358	2277	9816	9535	-	-
DD	33399	33503	47244	50109	-	-
DE	36178	35329	48219	47869	-	-
DF	3722	4312	13774	13701	-	-
DG	44122	42315	11603	11644	59465	47477
DH	29189	29880	27652	26084	-	-
DI	79962	92809	43822	42654	-	-
DJ	118709	111292	155033	144280	-	-
DK	21463	22051	4088	4111	-	-
DL	18932	20941	9840	9218	-	-
DM	30935	31333	7918	7677	-	-
DN	18776	18722	26113	25925	13606	10341
E	177385	166303	311294	299679	-	-
EA	177385	166303	311294	299679	-	-

**Table 1.5.4 – PPI 2007 and 2008 weight relatives comparison. MIGs aggregates per Entity.**

MIG	FBIH		RS		DB	
	2007	2008	2007	2008	2007	2008
Total	1000000	1000000	1000000	1000000	1000000	1000000
Intermediate goods	237323	241668	294602	283982	67295	61127
Capital goods	52780	53947	39406	36530	-	-
Consumer durables	15868	16027	11004	10737	7260	5486
Consumer non durables	196812	198315	134377	138939	459092	463950
Consumer goods	212680	214342	145382	149676	466353	469437
Energy	205048	196602	310569	306437	-	-

**Table 1.5.5 – PPI 2007 and 2008 weights comparison. Main NACE aggregates per Entity.**

NACE main aggregates	FBiH		RS		DB	
	2007	2008	2007	2008	2007	2008
Total	606037	596878	364243	362690	29720	40432
C	676184	648154	323816	351846	-	-
CA	726300	685696	273700	314304	-	-
CB	464925	480290	535075	519710	-	-
D	633774	624899	321669	315414	44556	59688
DA	628781	593587	259092	260531	112127	145882
DB	470389	472284	529611	527716	-	-
DC	285522	282136	714478	717864	-	-
DD	540482	523853	459518	476147	-	-
DE	555223	548468	444777	451532	-	-
DF	310128	341215	689872	658785	-	-
DG	816888	804373	129119	134492	53993	61135
DH	637195	653398	362805	346602	-	-
DI	752230	781696	247770	218304	-	-
DJ	560247	559356	439753	440644	-	-
DK	897280	898274	102720	101726	-	-
DL	761954	789010	238046	210990	-	-
DM	866667	870414	133333	129586	-	-
DN	534327	532255	446683	447832	18990	19913
E	486681	477332	513319	522668	-	-
EA	486681	477332	513319	522668	-	-

**Table 1.5.6 – PPI 2007 and 2008 weight relatives comparison. MIGs aggregates per Entity.**

MIG	FBiH		RS		DB	
	2007	2008	2007	2008	2007	2008
Total	396285	597931	592782	388426	10933	13643
Intermediate goods	713230	727623	286770	272377	0	0
Capital goods	712636	713656	266153	264306	21211	22038
Consumer durables	658140	625645	241998	242317	99862	132038
Consumer non durables	661916	631468	243671	243772	94413	124760
Consumer goods	550758	537152	449242	462848	0	0
Energy	396285	597931	592782	388426	10933	13643

### 1.6 Indices structure

The PPI is a weighted arithmetic means of simple geometric means. By using a different terminology, the PPI is a nested Laspeyres index based on the Jevons ones.

The first step of the procedure for compiling the PPI deals with the calculation of a series of ratios each one being the quotient between two prices: the current price (numerator) and the price base (denominator). When indices are chained, the price base is that of the month of December of the year  $y-1$ . The quotient of such a ratio is also known as price relative (of the item  $k$ ). In formula

$$[2] \quad I_k^{y,m} = \frac{P_k^{y,m}}{P_k^{y-1,12}}$$

The second step of the compiling procedure is the synthesis of the information collected at the item level. For a given product,  $K$ , this synthesis is obtained by using the simple geometric mean (or Jevons elementary price index) of all and only those price relatives that can be associated to it. It's worth noting that while the first step of the procedure involves the calculation of  $M$  price relatives ( $M$  = total number of items), the second step concerns the calculation of  $K$  simple arithmetic means, one per product.

$$[3] \quad I_K^{y,m} = \left( \prod_{k \in K} I_i^{y,m} \right)^{1/k \in K}$$

The reason for using a simple (geometric) mean for aggregating the price relatives is that there is no information to set up a weights structure at item level. The hypothesis underlying is that price relatives have all the same weight in determining their correlated product indexes.

The final step of the compiling procedure is the calculation of the synthetic indexes, i.e. the upper level indexes in terms of NACE classification. The aggregation criterion is a weighted arithmetic means, the well-known Laspeyres formula. From the 4-digit level up to the overall index, the Laspeyres formula is always used.

$$[4] \quad I_A^{y,m} = \sum_{K \in A} I_K^{y,m} \times w_A$$

where

$$[5] \quad w_A = \frac{\sum_{K \in A} W_K}{\sum_K W_K}$$

i.e. the weight relative of the aggregate A within the classification used. The equation [5] is the ratio between the absolute weight of A (given by the sum of the absolute weights of all the products that belong to A) and the total weight or the overall index weight, equal to the sum of all the product absolute weights in the index breakdown. The longitudinal structure of weights is therefore nested: given a generic aggregate, A, its weight in terms of NACE classification is equal to the sum of all the lower (weights) aggregates belonging to A. In other words, if A is 3-digit level (group) in the NACE classification, its weight is equal to the sum of all the 4-digit level (classes) aggregates belonging to A (i.e. all the 4-digit level whose first 3 digits are the same of A). On the other hand, the sum of all the aggregates at 4-digit level is equal to the sum of all their upper classes. Here is the other aspect of the nested structure: chosen a generic aggregate level, for instance the 4-digit level, the sum of the 4-digit level aggregates is equal to the same scalar: 1 or its multiples. The weights are nested because, for each aggregate, the sum of weights is always equal to the same scalar: 1 or its multiples.

For what concerns the MIGs indices, the aggregation holds by considering groups of products. Therefore, each MIG index is carried out aggregating the elementary product indices that “belong” (in terms on PRODCOM) to it. The formula used is always the Laspeyres one.

### *1.7 Chained indices elements*

The aim of this paragraph is to briefly provide details about the meaning of chained indices. When we say that an index number is chained, we refer to an index annually chained on a monthly base. The monthly base commonly chosen is the month of December. Supposing to be in the year y, the chained index of the month m is the ratio between the price collected at time m

and the price of December of the year  $y - 1$ . This last price is the price base also known as calculation base. Therefore, at the year  $y$ , price relatives are calculated by dividing each item price – at the (current) month  $m$  – by its corresponding value of December of the previous year,  $y - 1$ . Formulas,

$$[5] \quad I_{y-1,12;A}^{y,m}$$

$$[6] \quad I_{B;A}^{y,m}$$

show, respectively, the calculation base index and the reference base index (B), both compiled – for the aggregate A – in the month  $m$  of the year  $y$ . Of course, new items (i.e. selected for the first time) enter in the sample in December of the year  $y-1$  and their price relatives will be calculated – starting from January of the year  $y$  – onwards.

The reference base index, for a given aggregate A and at time  $(y, m)$ , is the product of two terms: the calculation base index and the linking coefficient.

$$[7] \quad I_{B;A}^{y,m} = I_{y-1,12;A}^{y,m} \times \prod_{j=B+1}^{y-1} I_{y-j,0;A}^{y-j,12}$$

where  $B = 0$ , so that  $B + 1 = 1$ .

#### **Example 1.7.1 – calculation and reference base indices**

Looking at Table 1.7.2, let's focus on the reference base index at time  $y = 5$ ,  $m = \text{May}$ . In Table 1.7.1 the corresponding calculation base indices are shown. The reference base index at time  $(y = 5, m = 5)$  is the result of an equation like [7]; in particular, the following equalities hold:

$$I_{1,0}^{1,12} = 1,002, I_{2,0}^{2,12} = 1,015, I_{3,0}^{3,12} = 1,019, I_{4,0}^{4,12} = 1,010$$

and

$$I_{4,0}^{5,5} = 1,004$$

Therefore<sup>2</sup>,

$$I_B^{5,5} = 1,051 = 1,004 \times 1,002 \times 1,015 \times 1,019 \times 1,010$$

Note that while in the Tables 1.7. indices are expressed in per cent, in the calculations above they don't.

### Example 1.7.2 – towards a new reference base: the re-scaling procedure

Let us suppose to be at time  $y = 5$  and to decide to update the reference base. We know that when indices are chained, the (calculation) base is updated annually. Therefore the reference base is always updated and its change is only an algorithmic operation: the old reference base is replaced with the new one. Such an operation is simply a re-scaling of the indices. Technically, the problem of substituting the old reference base  $y = 1$  with the new one,  $y = 5$ , is solved by re-scaling the reference base indices (of the year  $y = 5$ ). The twelve reference base indices are divided by their simple arithmetic mean. The result is a new set of indices for the same year  $y = 5$  but now referring to the new reference base: the year  $y = 5$  (see Table 1.7.3). Then,

$$\bar{I}_{B=0}^5 = \frac{1}{12} \sum_{m=1}^{12} I_{B=0}^{5,m} \Rightarrow \forall_m I_{B=0}^{5,m}, I_{B=5}^{5,m} = I_{B=0}^{5,m} \div \bar{I}_{B=0}^5$$

i.e. being,

---

<sup>2</sup> Actually, when dealing with such a calculations, the rounding off criterion used should be specified, i.e. at what digit data (indices) are rounded off. A good practice, in particular when managing chained indices, could be the rounding off at the sixth digit, both for the calculation indices and their ratios (reference base indices). Then, cutting indices (or per cent indices) at the third (first) digit rounded off. In these examples however, we didn't apply such good rule and verify the results by comparing the Tables 1.7. Therefore, some results could be different owing to they were derived rounding off with a lesser number of decimals.

$$\bar{I}_{B=0}^5 = \frac{1}{12} \sum_{m=1}^{12} I_{B=0}^{5,m} = 1,05$$

it holds that,

$$I_{B=5}^{5,1} = 0,998 = \frac{1,048}{1,05}; I_{B=5}^{5,2} = 0,995 = \frac{1,045}{1,05}; \dots; I_{B=5}^{5,12} = 1,004 = \frac{1,054}{1,05}$$

Finally, in terms of indices time (basic reference) series, once the reference base has been updated (in the sense of a re-scaling), the backwards reconstruction of the (new) reference base indices, actually completes the re-scaling procedure.

Table 1.7.4 shows the (new) reference base indices. Of course, this calculation follows exactly the same method used for deriving the new reference base indices. In other words, all the old reference base indices are re-scaled by dividing each one by the arithmetic mean of the year  $y = 5$ . For instance, focusing the attention on month  $m = 9$  (September) for the years  $y_j$  ( $j = 1, \dots, 4$ ), the comparison between the ninth columns of Tables 1.7.2 and 1.7.4 can be analysed looking at the following:

$$I_{B=5}^{1,9} = 0,953 = \frac{1,001}{1,05}; I_{B=5}^{2,9} = 0,977 = \frac{1,028}{1,05}; \dots; I_{B=5}^{4,9} = 0,996 = \frac{1,046}{1,05}$$

Further, it holds that

$$D_{y,m-1;B=0}^{y,m} = D_{y,m-1;B=5}^{y,m}$$

and

$$D_{y-1,m;B=0}^{y,m} = D_{y-1,m;B=5}^{y,m}$$

i.e. the re-scaling procedure does not modify the index rate of change (both month to month and twelve-month). In fact, let us consider the year  $y = 3$  and the month of June (see Tables 1.7.2 and 1.7.4). The indices month to month and twelve-month rates of change are respectively:

$$D_{3,5;B=0}^{3,6} = \frac{1,026}{1,023} = 1,003 = \frac{0,977}{0,974} = D_{3,5;B=5}^{3,6}$$

$$D_{2,6;B=0}^{3,6} = \frac{1,026}{1,012} = 1,014 = \frac{0,977}{0,964} = D_{2,6;B=5}^{3,6}$$

Coming back to equation [7] it can be seen that there is another way of deriving the reference base index.

$$[8] \quad I_{B;A}^{y,m} = I_{y-1,12;A}^{y,m} \times I_{B;A}^{y-1,12}$$

For instance, the same result in Example 1 can be derived by the following

$$I_B^{5,5} = 1,051 = 1,004 \times 1,046$$



**Table 1.7.1 – Calculation base indices**

Years	Months											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Ago	Sep	Oct	Nov	Dec
y = 1	100,4	100,5	100,9	100,1	98,9	99,0	99,7	100,2	100,1	100,4	99,6	100,2
y = 2	100,2	100,5	100,9	100,6	100,8	101,0	100,5	102,3	102,4	103,0	102,1	101,5
y = 3	100,1	100,5	100,1	100,0	100,6	100,9	99,9	101,0	101,5	101,8	101,9	101,9
y = 4	100,3	100,4	100,8	100,8	100,2	100,4	100,7	100,8	100,1	100,5	100,9	101,0
y = 5	100,1	99,8	99,9	100,3	100,4	100,7	100,5	100,3	99,9	100,1	100,5	100,7
y = 6	103,8	104,8	104,7	105,4	106,2	106,3	106,6	107,4	105,9	106,4	106,7	107,4
y = 7	99,8	99,4	100,0	100,2	100,7	101,6	101,2	100,7	100,3	99,9	101,2	101,4

**Table 1.7.2 – (old) Reference base indices (B = 0)**

Years	Months											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Ago	Sep	Oct	Nov	Dec
y = 1	100,4	100,5	100,9	100,1	98,9	99,0	99,7	100,2	100,1	100,4	99,6	100,2
y = 2	100,4	100,7	101,1	100,8	101,0	101,2	100,7	102,5	102,6	103,2	102,3	101,7
y = 3	101,8	102,2	101,8	101,7	102,3	102,6	101,6	102,7	103,2	103,5	103,6	103,6
y = 4	103,9	104,0	104,4	104,2	103,8	104,0	104,3	104,4	103,7	104,1	104,5	104,6
y = 5	104,8	104,5	104,6	105,0	105,1	105,4	105,2	105,0	104,6	104,8	105,2	105,4
y = 6	104,2	105,2	105,1	105,8	106,6	106,7	107,0	107,4	105,9	109,4	106,7	107,4
y = 7	107,6	107,2	107,8	108,1	108,6	109,6	109,1	108,6	108,1	107,7	109,1	109,3

**Table 1.7.3 Re-scaling indices**

Year	Months											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Ago	Sep	Oct	Nov	Dec
y = 5	99,8	99,5	99,8	100,0	100,1	100,4	100,2	100,0	99,6	99,8	100,2	100,4

**Table 1.7.4 – (new) Reference base indices (B = 5)**

Years	Months											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Ago	Sep	Oct	Nov	Dec
y = 1	95,6	95,7	96,1	95,3	94,2	94,3	95,0	95,4	95,3	95,6	94,9	95,4
y = 2	95,6	95,9	96,3	96,0	96,2	96,4	95,9	97,6	97,7	98,3	97,4	96,9
y = 3	97,0	97,3	97,0	96,9	97,4	97,7	96,8	97,8	98,3	98,6	98,7	98,7
y = 4	99,0	99,0	99,4	99,2	98,9	99,0	99,3	99,4	98,8	99,1	99,5	99,6
y = 5	99,8	99,5	99,6	100,0	100,1	100,4	100,2	100,0	99,6	99,8	100,2	100,4
y = 6	104,2	105,2	105,1	105,8	106,6	106,7	107,0	107,4	105,9	109,4	106,7	107,4
y = 7	107,6	107,2	107,8	108,1	108,6	109,6	109,1	108,6	108,1	107,7	109,1	109,3

### 1.8 Decomposing the Index rates of change

First of all, when talking about monthly rate of change of the index, it is common to refer to the rate of change between the index at time  $m$  and at time  $m-1$ , while for the twelve-month rate of change the ratio is compiled by the index at time  $t$  (for the year  $y$ ) and the corresponding index at time  $t$  (in the year  $y-1$ ). The following formulas are index rates of change in terms of reference base

$$[9] \quad D_B^{m, m-1} = \frac{I_B^{y, m}}{I_B^{y, m-1}} - 1$$

$$[10] \quad D_B^{y, y-1} = \frac{I_B^{y, m}}{I_B^{y-1, m}} - 1$$

Of course the equations [9] and [10] can be tailored for any sub-aggregate  $k$  of the overall index:

$$[11] \quad D_{B;k}^{m, m-1} = \frac{I_{B;k}^{y, m}}{I_{B;k}^{y, m-1}} - 1$$

$$[12] \quad D_{B;k}^{y, y-1} = \frac{I_{B;k}^{y, m}}{I_{B;k}^{y-1, m}} - 1$$

When dealing with chained indexes, it's worth noting that their non-additivity – in terms of basic reference year – implies some expedients to be used concerning the rate of change calculation and its (correct) interpretation. The month to month and the twelve-month rate of change (of the total index) are defined (in terms of calculus base) respectively by the following formulas:

$$[13] \quad D_{y,m-1}^{y,m} = \frac{I_{y,0}^{y,m}}{I_{y,0}^{y,m-1}} - 1$$

$$[14] \quad D_{y-1,m}^{y,m} = \frac{I_{y-1,0}^{y-1,12}}{I_{y-1,0}^{y-1,m}} I_{y-1,0}^{y,m} - 1$$

Once defined how to calculate the index rate of change in terms of i) monthly and twelve-month rate of change; ii) basic reference year and calculus base; iii) overall index and its sub-aggregates  $k$ , the data analysis suggests a crucial question: how to measure the contribution of each aggregate  $k$  in determining the overall index rate of change. The answer of Ribe (1999) gives a useful solution. Following the Ribe proposal, both the month to month and the twelve-month rate of change can be “decomposed” in coherent (see additive) sub components, each of them measuring the actual contribution in determining the overall rate of change. In fact, supposing the overall index with a breakdown in  $k$  sub-aggregates or groups (of products) its formula is

$$[15] \quad I_{y,0}^{y,m} = \sum_k w_{y,0;k} \times I_{y,0;k}^{y,m}$$

being  $w_{y,0;k}$  the sub aggregate  $k$  weight. The basic idea of the Ribe decomposition is that the sum of the effects of the aggregates rates of change is equal to the total index rate of change.

Therefore, given a generic sub aggregate,  $k$ , the rate of change of  $k$  may be regarded as its actual contribution to the total index rate of change, both monthly and in terms of the twelve-month index rate of change. In formulas, this means – respectively for the equation [9] and [10] – that

$$[16] \quad C_{y,m-1}^{y,m} = \sum_k C_{y,m-1;k}^{y,m}$$

$$[17] \quad C_{y-1,m}^{y,m} = \sum_k C_{y-1,m;k}^{y,m}$$

where

$$[18] \quad C_{y,m-1;k}^{y,m} = \frac{w_{y,0;k}}{I_{y,0}^{y,m-1}} \times \left( I_{y,0;k}^{y,m} - I_{y,0;k}^{y,m-1} \right)$$

$$[19] \quad C_{y-1,m;k}^{y,m} = w_{y,0;k} \times \frac{I_{y-1,0}^{y-1,12}}{I_{y-1,0}^{y-1,m}} \times \left( I_{y,0;k}^{y,m} - 1 \right) \\ + \frac{w_{y-1,0;k}}{I_{y-1,0}^{y-1,m}} \times \left( I_{y-1,0;k}^{y-1,12} - I_{y-1,0;k}^{y-1,m} \right)$$

Furthermore, for the twelve-month rate of change, such a decomposition has a second relevant property: it shows that the (total and the sub aggregate) index rate of change can be decomposed in two additive parts: the previous and the current year effect.

By adding and subtracting  $I_{y-1,0}^{y-1,12}$  in equations [10], we derive the following equation in which the first addend on the left is the current year effect, while the second one is the previous year effect

$$[20] \quad C_{y-1,m}^{y,m} = \underbrace{\frac{I_{y-1,0}^{y,12}}{I_{y-1,0}^{y,12}} (I_{y-1,0}^{y,m} - 1)}_{\text{current year effect}} + \underbrace{\left( \frac{I_{y-1,0}^{y,12}}{I_{y-1,0}^{y,12}} - 1 \right)}_{\text{previous year effect}} = C_{y-1,m}^{y,m}(\alpha) + C_{y-1,m}^{y,m}(\beta)$$

$$\begin{aligned}
[21] \quad C_{y-1,m;k}^{y,m} &= \underbrace{w_{y,0;k} \times \frac{I_{y-1,0}^{y-1,12}}{I_{y-1,0}^{y-1,m}} \times \left( I_{y,0;k}^{y,m} - 1 \right)}_{\text{current year effect}} \\
&+ \underbrace{\frac{w_{y-1,0;k}}{I_{y-1,0}^{y-1,m}} \times \left( I_{y-1,0;k}^{y-1,12} - I_{y-1,0;k}^{y-1,m} \right)}_{\text{previous year effect}} \\
&= C_{y-1,m;k}^{y,m}(\alpha) + C_{y-1,m;k}^{y,m}(\beta)
\end{aligned}$$

**Example 1.8.1 – Additive decomposition of the index rate of change**

Let us suppose to manage a chained index price whose breakdown foresees only two sub-aggregates, A and B. Furthermore, we will analyse the situation of indices and their rates of change in a restricted time series interval: two years ( $y$  and  $y - 1$ ) with monthly data. Let the following be the system of *weight relatives*

	<b>y</b>	<b>y-1</b>
A	0,85	0,60
B	0,15	0,40
G	1,00	1,00

In the Tables 1.8.1 and 1.8.2 indices in calculation and reference base are shown respectively. G is the overall - or total - index, while A and B its sub-aggregates.

Using formulas [9] – [12] we derive the results of column [3] in Table 1.8.3 and column [3] in Table 1.8.5 i.e. respectively the twelve-month and month to month (reference base) indices rate of change. In fact, as concerns Table 1.8.3, column [3] we have

$$\begin{aligned}
[22] \quad A &\rightarrow (1,086 \div 0,975) - 1 = 0,1138 \\
B &\rightarrow (1,091 \div 1,040) - 1 = 0,0490 \\
G &\rightarrow (0,991 \div 1,090) - 1 \cong 0,0999
\end{aligned}$$

while, in Table 1.8.5, column [3] we have

$$\begin{aligned}
 [23] \quad A &\rightarrow (1,098 \div 1,086) - 1 = 0,0110 \\
 B &\rightarrow (1,096 \div 1,091) - 1 = 0,0050 \\
 G &\rightarrow (1,100 \div 1,090) - 1 \cong 0,0092
 \end{aligned}$$

*Topic 1. Decomposition of the twelve-month rates of change within sub-aggregates*

Given the twelve-month aggregate rates of change, which is the effect (contribution) due to the current and the previous year? In other words, the problem is how to decompose the twelve-month rate of change in two additive sub-components: the first is the contribution (to the twelve-month rate of change) of the index dynamics since the beginning of the year  $y$ . The second is the contribution due to the past index dynamics, or what has been inherited from the previous year  $y-1$ . Therefore (see Table 1.8.3), by applying, for each aggregate (A, B and G), the equation [20], it follows

$$\begin{aligned}
 [24] \quad A &\rightarrow C_{y-1,m;A}^{y,m} = C_{y-1,m;A}^{y,m}(\alpha) + C_{y-1,m;A}^{y,m}(\beta) \\
 &= (1,116 \div 1,011) \times (1,009 - 1) + [(1,116 \div 1,011) - 1] \\
 &= 0,00993472 + 0,10385757 = 0,11379229 \cong 0,1138
 \end{aligned}$$

$$\begin{aligned}
 B &\rightarrow C_{y-1,m;B}^{y,m} = C_{y-1,m;B}^{y,m}(\alpha) + C_{y-1,m;B}^{y,m}(\beta) \\
 &= (1,072 \div 1,021) \times (0,999 - 1) + [(1,072 \div 1,021) - 1] \\
 &= -0,00104995 + 0,04995103 = 0,04890108 \cong 0,0489
 \end{aligned}$$

$$\begin{aligned}
 G &\rightarrow C_{y-1,m;G}^{y,m} = C_{y-1,m;G}^{y,m}(\alpha) + C_{y-1,m;G}^{y,m}(\beta) \\
 &= (1,109 \div 1,013) \times (1,005 - 1) + [(1,109 \div 1,013) - 1] \\
 &= 0,00547384 + 0,09476802 = 0,10024186 \cong 0,1002
 \end{aligned}$$

*Topic 2. Decomposition of the twelve-month rates of change among the sub-aggregates*

Now, let us look at the aggregates A and B and their respective twelve-month rates of change. The problem consists in analysing their contribution to the twelve-month rate of change of the main aggregate, i.e. G. If we look at the first column of Table 1.8.4, we note that the twelve-month rates of change are not additive: the rate of G is not equal to the sum of those of A and B. Therefore, the aim of the twelve-month rate decomposition is to explain in terms of additive sub-components how the overall rate of change can be actually seen as the sum of two sub-components, each one corresponding to its own sub-aggregate. Further, we will be able to measure not only the contributions of the sub-aggregates but also which part of these contributions is due to the current sub-component and the previous one.

The decomposition problem, as provided by the equation [21], can be faced as follows:

$$\begin{aligned} [25] \quad A \rightarrow C_{y-1,m;A}^{y,m} &= C_{y-1,m;A}^{y,m}(\alpha) + C_{y-1,m;A}^{y,m}(\beta) \\ &= 0,6 \times (1,109 \div 1,013) \times (1,009 - 1) + (0,85 \div 1,013) \times (1,116 - 1,011) \\ &= 0,00591175 + 0,08810464 = 0,09401639 \\ &\Leftrightarrow 0,0059 + 0,0881 = 0,0940 \\ &\Leftrightarrow \alpha_A + \beta_A = 0,0940 \end{aligned}$$

$$\begin{aligned} B \rightarrow C_{y-1,m;B}^{y,m} &= C_{y-1,m;B}^{y,m}(\alpha) + C_{y-1,m;B}^{y,m}(\beta) \\ &= 0,4 \times (1,109 \div 1,013) \times (0,999 - 1) + (0,15 \div 1,013) \times (1,072 - 1,021) \\ &= -0,00043791 + 0,00755183 = 0,10113031 \\ &\Leftrightarrow -0,0004 + 0,0076 = 0,0076 \\ &\Leftrightarrow \alpha_B + \beta_B = 0,0076 \end{aligned}$$

These formulas meet a twofold goal (see Table 1.8.4): on the one side, it allows to “measure” the effect on the overall index (twelve-month) rate of change that is due to its own sub-components, A and B; on the other side, it is also possible to assign to each sub-aggregates how much of their contributes are due to the current year and how much is due to the previous one. The equation [21] gives an additive solution to this theme; in fact, the following holds:

*Current year sub-component:*

$$[26] \quad C_{y-1,m;G}^{y,m}(\alpha) = C_{y-1,m;A}^{y,m}(\alpha) + C_{y-1,m;B}^{y,m}(\alpha)$$

$$0,00591175 + (-0,00043791) \cong 0,00547384$$

*Previous year sub-component:*

$$C_{y-1,m;G}^{y,m}(\beta) = C_{y-1,m;A}^{y,m}(\beta) + C_{y-1,m;B}^{y,m}(\beta)$$

$$0,08810464 + 0,00755183 \cong 0,09565647$$

*Overall index rate of change decomposition*

$$C_{y-1,m;G}^{y,m} = C_{y-1,m;G}^{y,m}(\alpha) + C_{y-1,m;G}^{y,m}(\beta)$$

$$0,00547384 + 0,09565647 \cong 0,10113031 \cong 0,1011$$

*Contribute of A in determining the overall index rate of change decomposition*

$$[27] \quad C_{y-1,m;G}^{y,m} = C_{y-1,m;A}^{y,m} + C_{y-1,m;B}^{y,m}$$

$$= C_{y-1,m;A}^{y,m}(\alpha) + C_{y-1,m;A}^{y,m}(\beta) + C_{y-1,m;B}^{y,m}(\alpha) + C_{y-1,m;B}^{y,m}(\beta)$$

$$= (0,00591175 + 0,08810464) + (-0,00043791 + 0,00755183)$$

$$= 0,009401639 + 0,00711392 = 0,10113031 \cong 0,1011$$

*Topic 3. Decomposition of the month to month rate of change*

Finally, formula [18] (and its results in Table 1.8.5) allows to complete the decomposition theme concerning the indices rate of change. Here the problem concerns the month to month index rate of change.

$$[28] \quad C_{y,m-1;A}^{y,m} = \frac{w_{y,0;k}}{I_{y,0}^{y,m-1}} \times \left( I_{y,0;A}^{y,m} - I_{y,0;A}^{y,m-1} \right)$$

$$= (0,6 \div 1,028) \times (1,020 - 1,009) \cong 0,0064$$



$$C_{y,m-1;B}^{y,m} = \frac{w_{y,0;k}}{I_{y,0}^{y,m-1}} \times \left( I_{y,0;B}^{y,m} - I_{y,0;B}^{y,m-1} \right)$$

$$= (0,4 \div 1,028) \times (1,040 - 0,999) \cong 0,0159$$

$$D_{y,m-1;G}^{y,m} = \frac{I_{y,0}^{y,m}}{I_{y,0}^{y,m-1}} - 1 = (1,028 \div 1,005) - 1 = 0,0023$$

Here is the final result:

$$D_{y,m-1;G}^{y,m} = C_{y,m-1;A}^{y,m} + C_{y,m-1;B}^{y,m}$$

$$= 0,0064 + 0,0159 = 0,0023$$

**Table 1.8.1 – Calculation base indices**

Aggregates	Weights		Calculation base indices						
	$w^{y-1}$	$w^y$	$I_{y-1,0}^{y-1,m}$				$I_{y,0}^{y,m}$		
			1	2	...	12	1	2	...
A	0.85	0.60	1,011	1,017	...	1,116	1,009	1,020	...
B	0.15	0.40	1,021	1,023	...	1,072	0,999	1,040	...
G	1.00	1.00	1,013	1,018	...	1,109	1,005	1,028	...

**Table 1.8.2 – Reference base indices**

Aggregates	Weights		Reference base indices						
	$w^{y-1}$	$w^y$	$I_B^{y-1,m}$				$I_B^{y,m}$		
			1	2	...	12	1	2	...
A	0.85	0.60	0,975	0,980	...	1,076	1,086	1,098	...
B	0.15	0.40	1,040	1,042	...	1,092	1,091	1,096	...
G	1.00	1.00	0,991	0,996	...	1,085	1,090	1,100	...

**Table 1.8.3 - Twelve-month rates of change decomposition (m = January)**  
(Contribution of the current and previous year sub-components on the aggregates rates of change)

Aggregates	$I_B^{y-1,m}$	$I_B^{y,m}$	$C_{y-1,m}^{y,m}$	$C_{y-1,m}^{y,m}(\alpha)$	$C_{y-1,m}^{y,m}(\beta)$
	[1]	[2]	[3]	[4]	[5]
A	0,975	1,086	0,1138	0,0099	0,1039
B	1,040	1,091	0,0490	- 0,0010	0,0499
G	0,991	1,090	0,0999	0,0005	0,0948

**Table 1.8.4 - Twelve-month rates of change decomposition  
(m = January)**

(Contribution of the sub-aggregates A, B  
in determining the overall index rate of change)

Aggregates	$D_{y-1,m}^{y,m}$	$C_{y-1,m}^{y,m}(\alpha)$	$C_{y-1,m}^{y,m}(\beta)$	$C_{y-1,m}^{y,m}(\alpha + \beta)$
	[1]	[2]	[3]	[4]
A	0,1138	0,0059	0,0881	0,0940
B	0,0490	- 0,0004	0,0076	0,0071
G	0,0999	0,0055	0,0957	-

**Table 1.8.5 – Month to month rates of change decomposition  
(m = February)**

(Contribution of the sub-aggregates A, B in  
determining the overall index rate of change)

Aggregates	$I_{y,0}^{y,m-1}$	$I_{y,0}^{y,m}$	$D_{y,m-1}^{y,m}$	$C_{y,m-1}^{y,m}$
	[1]	[2]	[3]	[4]
A	1,009	1,020	0,0110	0,0064
B	0,999	1,040	0,0410	0,0159
G	1,005	1,028	0,0023	-

### *1.9 Survey questionnaire*

Data collection is carried out through a monthly papery form. A good design of the questionnaire is essential for the success of the price data collection and for the release of accurate and reliable results. It is important that the respondent unit (enterprise) understands what the questionnaire is asking; the format and layout should facilitate the National Institute of Statistics (NSI) in the data extraction (price, item description, etc) for effective quality assurance.

To meet these objectives, the questionnaire should:

- provide clear instructions on what the respondent is required to do;
- provide a clear definition of the product requiring data;
- show how to change the description of the item (quality changes);
- ensure supporting notes for each item of data to be collected;
- request reasons for price changes;
- enable respondents to complete the form quickly and accurately;
- use simple and clear language;
- clearly identify the organization responsible for the survey, provide a contact point and telephone number for enquiries and further information.

Paragraph 1.11 shows an example of the survey questionnaire that the NSI should send to reporting units at the beginning of each year together with the introductory letter presenting the survey, the guide for a correct compilation and a blank model (survey documentation). The questionnaire displays all information contained in the software application for data entry (see Chapter 3 ) and it is structured into the following sections:

1. Heading
2. Personal data and time period
3. Product description
4. Item description
5. Monthly information

Sections from 1 to 4 are pre-filled with the information inserted in the database, given by the reporting units both for defining the base of the index and with those provided during the year to specify quality changes or additional new items. The pre-filled form enables respondents to complete the form more quickly and accurately and helps to avoid mistake.

### Section I – Heading

<b>LOGOS OF THE INSTITUTE OF STATISTICS</b>	MONTHLY SURVEY ON PRODUCER PRICES OF INDUSTRIAL PRODUCTS SOLD ON <b>DOMESTIC MARKET</b>	<b>Mod. C-41</b>
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Section I contains the logos of the NSI, the name of the survey and the form code.

### Section II - Personal data and time period

<b>NAME OF THE INSTITUTE OF STATISTICS</b>	<b>ENTERPRISE CODE 123456789</b>	<b>YEAR 2007</b>			
<i>PRICE STATISTICS DIVISION</i>	<i>Personal data of respondent</i>	Month			
E-mail: pre-filled	Surname and Name: pre-filled	January	February	March	April
Adresses: pre-filled	Phone: pre-filled	May	June	July	August
Phones: pre-filled	Fax: pre-filled	September	October	November	December
Fax: pre-filled	E-mail: pre-filled	Mark with 'X' the cell corresponding to the current month			

Section II contains personal data and it is divided into the following parts: the first one includes e-mail, address, phones and fax of the NSI. A contact point (telephone and fax numbers) is also indicated, so that respondents can get in touch to resolve possible problems; the second part contains the enterprise code and the personal data of the responsible person.

Beside the personal data, there is the 'time period' part: the respondent has mark with a 'X' the cell corresponding to the current month.

### Section III - Product description

<b>Product code 12345678</b>	<b>Product description</b> Pre-filled
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The information contained in the third section concerns the product code and the definition (according to the PRODCOM classification) for which the reporting units have been asked the

identification of the most representative items produced and sold. The products have been assigned to enterprises by the unit/product sampling (see § 1.4).

#### Section IV - Item description

	Serial code	Item description (*)	Unit Measure(*)	Quantity per unit(*)
1	1021	pre-filled	pre-filled	pre-filled
2	1022	pre-filled	pre-filled	Pre-filled
3	1023	pre-filled	pre-filled	pre-filled
4				

Section IV contains the information on price determining characteristics (item description, unit measure and quantity per unit) that can be changed by respondent only making a quality change by using a blank model (see §1.3 for rules to manage correctly quality changes).

The items - selected by enterprises (when necessary, with the assistance of NSI staff) - should:

- be the most representative item of the enterprise's domestic sales of the elementary product;
- reflect changes over time in the average prices of the elementary product;
- be produced and sold on a regular basis;
- be fully and clearly described. Accurate price transaction descriptions are critical in ensuring price transaction continuity (the continuity property ensures that the same price transaction is priced every month so that a picture of the price changes is established). To maintain this principle, a detailed description of the price transaction from respondents is needed. In other words, units should record all information uniquely defining the price transaction selected to make sure that the same price transaction is priced monthly.

An accurate description is also useful to control the quality changes: when the description of an item changes, a check has to be made to verify if the same item has been replaced or not. In the latter case, the change must be made.

- be as continuous as possible over time in order to ensure prices comparability over time (excluding the products tailor manufactured because their price would be a unique price, not comparable over the time).

### Example 1.9.1 - Item description:

Assuming the Prodcom8 15821255 ‘Sweet biscuits (excluding those completely or partially coated or covered with chocolate or other preparations containing chocolate)’:

correct description: Danish butter biscuits – tin packet – weight: 300 gram;

wrong description: Danish biscuit.

The second description is insufficient, as it is not detailed enough to identify a specific item for which the price has been established. In fact, the monthly price provided by the enterprise could be applied to many different packages, determining price changes that are not ‘pure’. Instead, the individual characteristics listed in the ‘correct description’ (e.g. ingredient, package and weight) ensure that the returned price is consistent from period to period, thus allowing changes of quality to be controlled.

### Section V - Deadline reminder

PLEASE RETURN THE QUESTIONNAIRE 10 DAYS BEFORE THE END OF THE CURRENT MONTH

Section V is an ‘deadline reminder’ that has the purpose to remind respondents to transmit the forms within 10 days from the end of the reference period. This reminder should help the NSI to reach a high response rate (permitting good quality in the indicator products and less enterprise to follow – up on) and to meet the deadline for data transmission (1 month and 15 calendar days) as required by Reg. STS 1158/05.

### Section VI – Monthly price

	Serial code	Sale made (indicate yes/no)	Price of previous month (in KM)	Price of current month (in KM)	If the monthly current price is not equal to the monthly one, mark with “x” the cell corresponding to the main reason for price change, [ see the reason for price change]
1	1021				① ② ③ ④ ⑤ ⑥ ⑦
2	1022				① ② ③ ④ ⑤ ⑥ ⑦
3	1023				① ② ③ ④ ⑤ ⑥ ⑦
4					① ② ③ ④ ⑤ ⑥ ⑦

#### Reason for price change

1	NORMAL MARKET PERFORMANCE	4	COMPETITIVE FACTORS	6	UP-DATING REFERENCE LIST PRICE
2	REDUCTION IN PRICE/PROMOTION	5	MATERIAL COSTS CHANGES	7	END OF PRICE REDUCTION/PROMOTION
3	CUSTOMER CHANGES				

Section VI concerns the information that has to be provided monthly by the respondent:

i) *sale made*: in this field the respondent has to mark ‘yes’ if the enterprise has realized the transaction or ‘no’ if the enterprise had no any item sale (in the last case the units shall not fill in the other fields). This information is useful to the NSI to identify two types of enterprises:

type 1, the enterprise, having sold any item, fulfills the 'sale made' field (respondent unit); type 2, the enterprise, having not sold item, doesn't fulfill in the 'sale made' field (non-respondent unit). In the first case, the unit is not subject to the follow-up procedure. In the second case, the enterprise has not sold goods but doesn't have to provide any information. In this case a follow-up procedure is necessary.

ii) *price of the current month and the previous one*: in this field the enterprise must indicate the transaction prices referred to the main transaction (in terms of turnover) that took place in the reference period and in the previous one. Entering double price allows both respondents and NSI to have an immediate check of the coherence between the previous monthly price and the current one;

iii) *reasons for price change*: when the current and the previous month price differ, the respondent is asked to mark with "x" the cell corresponding to the main cause for such change.

The list of causes is broken down in 7 positions:

1. normal market performance: the price change is irrelevant or it is ascribed to the normal market trend;
2. reduction in price/promotion: the price change is due to rebates or promotions;
3. customer changes: the current monthly price changes according to the quantity of goods ordered by the customers;
4. competitive factors: the current monthly price is due to market competition, i.e. when the enterprise wants to get a new share in the market (new clients) or maintain the old shares (old clients) or beat the competitive pressure from other countries;
5. material cost changes: changes affect the current price;
6. updating reference price list: the current price is updated on the basis of the new list of prices;
7. end of reduction and promotion: the transaction price comes back to the level existing before the reduction in price campaign.

Reasons for price change are useful for pre-validating data and for reducing re-follow up procedures with the respondents.

#### *1.10 Quality data checking*

Quality plays a fundamental role in the data production process context; high-quality standards allow the NSI to be confident with indices it produces and ensure that the observed price changes are genuine and not resulting from errors. Data editing procedures must be developed



to ensure that a high standard of data collection is maintained for each collection period. Data editing involves checks for studying the quality of data in terms of completeness, coherency and continuity of the basic information provided by respondents. It should be performed during the manual checking, data recording and validation phases.

The manual checking of the questionnaires should be carried out before data entry by the office personnel that monthly is charged of the following activities:

- prices are sent in due time. Otherwise, it would be necessary to take appropriate follow-up action (timely checks);
- form has completely been filled-in, i.e. that the required fields have not been left blank (completeness checks);
- all prices determining characteristics refer to the same characteristics of quality, quantity and terms of sale to ensure pure price change over time. This type of control is useful to identify change of quality not reported by enterprises (coherent checks);
- there is coherence between the current monthly price and the one received in the previous month (procedure of manual – non statistical– checking of price).

If the questionnaires don't pass the test of manual quality check, the staff should contact the respondent. This happens, for instance, when one or more of the following situations occur:

- a blank form: it needs to be understood if the blank form means “no sale” in the current month. In this case the respondent should have fill in the specific field “no sale” indicating “no”;
- form not completely filled in (incompleteness errors): it occurs when, for instance, the respondent provides price for two items and gives the price only for one;
- anomalous information:
  - price is not coherent with the item characteristics reported on the form (item description, measure unit and quantity per unit). Such a case occurs when the respondent makes quality changes without reporting them; it needs to receive the correct information;
  - the respondent makes quality changes but indicates ‘no sale’. The current monthly price and the previous one for the new item (or for the new measure unit, quantity per

unit) are needed for the construction of the index. Therefore the respondent can make the quality changes only when there has been a transaction of the item;

- the respondent has made a quality change or added a new item, indicating a item description non coherent with the assigned product;

- outlier price and incompleteness errors: there is no coherence between the current price and previous one and the enterprise has not provided the reason for this change.

After clearing up all errors that occurs during the manual checking, the information are imputed into the database, using a guided and checked data-entry procedure. It is integrated into the software application that was developed for managing the PPI survey process (see Chapter 3). In particular, this tool allows to eliminate incompleteness errors that should be verified during the recording phases and to identify the outlier prices. The first type of error is eliminated through mandatory fields, so that operators are obliged to give the requested information to complete the data registration. In the case of “no sale” in the current month, the system requires ticking out a specific box; the outliers prices are identified by a filtering method according to whether the price changes (by comparison between the current price and last monthly validated price) fall outside a predefined range (acceptance interval), such as  $\pm 10\%$  or even  $50\%$ . If outliers occur, the operator is forced to indicate the reason for price changes using a combo box that reports the same list of causes indicated on the questionnaire. The precoding and the recording of the outliers permit, in the subsequent phase of validation, to investigate only the variation falling out of the acceptance interval and not all the prices provided by the enterprise. The filtering method is useful to capture typing errors, cases where a respondent has erroneously reported on a different product or has made a quality change without reporting them. The acceptance range should be set independently for each product group. For products that have volatile prices, such as oil or seasonal items, it is recommended to have quite wide verification tolerances. Other products may have more stable prices, and narrower tolerances would be more appropriate. To set verification tolerances for a particular product, price changes over a period of time (two or more years) need to be analysed.

Once prices are recorded, the validation procedures (checks) should be run: the operators should detect all errors or outliers identified during the data entry phase by the filtering method. Practically, when a large price change has been identified the operators should always check it again. This activity can be carried out:

- comparing the data entered in the database with those reported on the questionnaire to verify possible typing errors;
- checking if the explanation given by the respondent adequately describes the divergent price behaviour;
- asking the respondent to check if the anomalous price is an error or not. In the first case, the respondent has to provide the correct price. If, on the contrary, the price is confirmed, further explanations about the divergent price development must be sought;
- comparing the current price change with the price change of the same or of a similar product to verify if the price behaviour is the same;
- analysing the time series index series of the aggregate (from elementary to overall index).

In order to meet the deadlines, it is preferable to place emphasis on those outliers that may have a significant impact on the final result. For example, let's consider an elementary aggregate (product) with a weight of 2 per cent contains 10 prices, and another elementary aggregate of equal weight referred to 100 prices: obviously, an error in a reported price will have a much smaller effect in the latter, where it may be negligible, while in the former it may cause a significant error in the elementary aggregate index and even influence higher-level indices.

Monthly, in addition to the above mentioned checks, other quality reports should be produced to inspect:

- the respondent doesn't answer for more than three months (non-respondent unit).

Non-response may be due to:

- relocation of the establishment in foreign countries;
- discontinuance of the output activity;
- change of the reference market: the enterprise has left the domestic market and sells its products mainly, and in permanent way, on foreign markets;
- refusal to co-operate;
- cease of the production activities;
- lack of awareness of the importance of statistics.

In this case it is recommended to verify the reason for the non-response, then to replace the previous respondent with another one able to provide the price for a similar item;

- the respondent provides “no sale” for more than three months;
- the respondent provides the same price over a long period of time.

In these cases it is useful a reminder telephone call with the aim of checking whether the item is no longer representative or the firm has stopped its production. In the former case a quality change is needed, in the latter a new company will be searched as a substitute.

After the validation phase, the registered data have to be submitted to automatic procedure for treating non-responses, quality changes and eventually correcting errors and outliers. Subsequent to the index compilation on the basis of validated data, a further manual checking should be made, aimed at locating possible inconsistencies in the trend of indices:

- firstly, a comparison should be made between the percentage change on the previous month and the percentage change on the corresponding month of the previous year of the item indices (the micro-indices);
- then, similar product indices should be compared;
- finally, a comparison should be carried out between the trend of product indices (or group indices) and alternative price index as consumer prices for the same groups or products.

In addition, it is recommended to inspect periodically the survey quality indicators for i) assessing the quality of the survey process; ii) identifying the necessary action for improving production processes; iii) checking the efficacy of the action taken for improving the quality of the survey phases. The quality indicators should be implemented throughout the different phases of the process. In this context are presented and built in the software (see Chapter 3) a set of standard quality indicators on data collection (referred both to enterprises and price quotations), editing and imputation phases. In future it could be useful to implement other indicators to monitor specific survey aspects or to meet users requirement. The data collection indicators have been defined with the aim of evaluating the success - or the failure – in obtaining information from the units (enterprises) during the monthly data collection. In particular, three different rates are available: total response rate, partial response rate and total non response rate (complementary to the response rate). The editing and imputation indicators have been developed with the aim of documenting to what extent the original data (price) have been

validated (price validate rate) and how much have been imputed (imputation rate). When the quality indicators assume anomalous value (alarm bells) further analysis should be performed to discover the causes of the strange value.

The definition of the quantities needed for the indicators calculation and their computation are presented in Figures 1.10.1 and 1.10.2 and in Tables from 1.10.1 to 1.10.3.

**Table 1.10.1 - Data collection indicators referred to enterprises**

INDICATOR	FORMULAS
<b>Dead units rate</b>	total dead units/in-scope units *100
<b>Live units rate</b>	total live units/in-scope units *100
<i>Percentage of live unit rate</i>	
<b>Total response rate</b>	total live respondents/in-scope units *100
<b>Partial non response rate</b>	total partial non-respondents / in-scope units *100
<b>Total non response rate</b>	total live non-respondents/in-scope units *100
<i>Percentage of response rate</i>	
<b>Deadline response rate</b>	respondents within the deadline/in-scope units *100
<b>Following contact response rate</b>	following contacts respondents/in-scope units *100
<i>Percentage of dead units rate</i>	
<b>Ceased production rate</b>	units that have stopped the production of the assigned product /in-scope units *100
<b>Cased respondents rate</b>	cased units / in-scope units *100
<b>Refusal rate</b>	refusing units / in-scope units *100
<b>Other reasons rate</b>	ceased units for other reasons/in-scope units *100

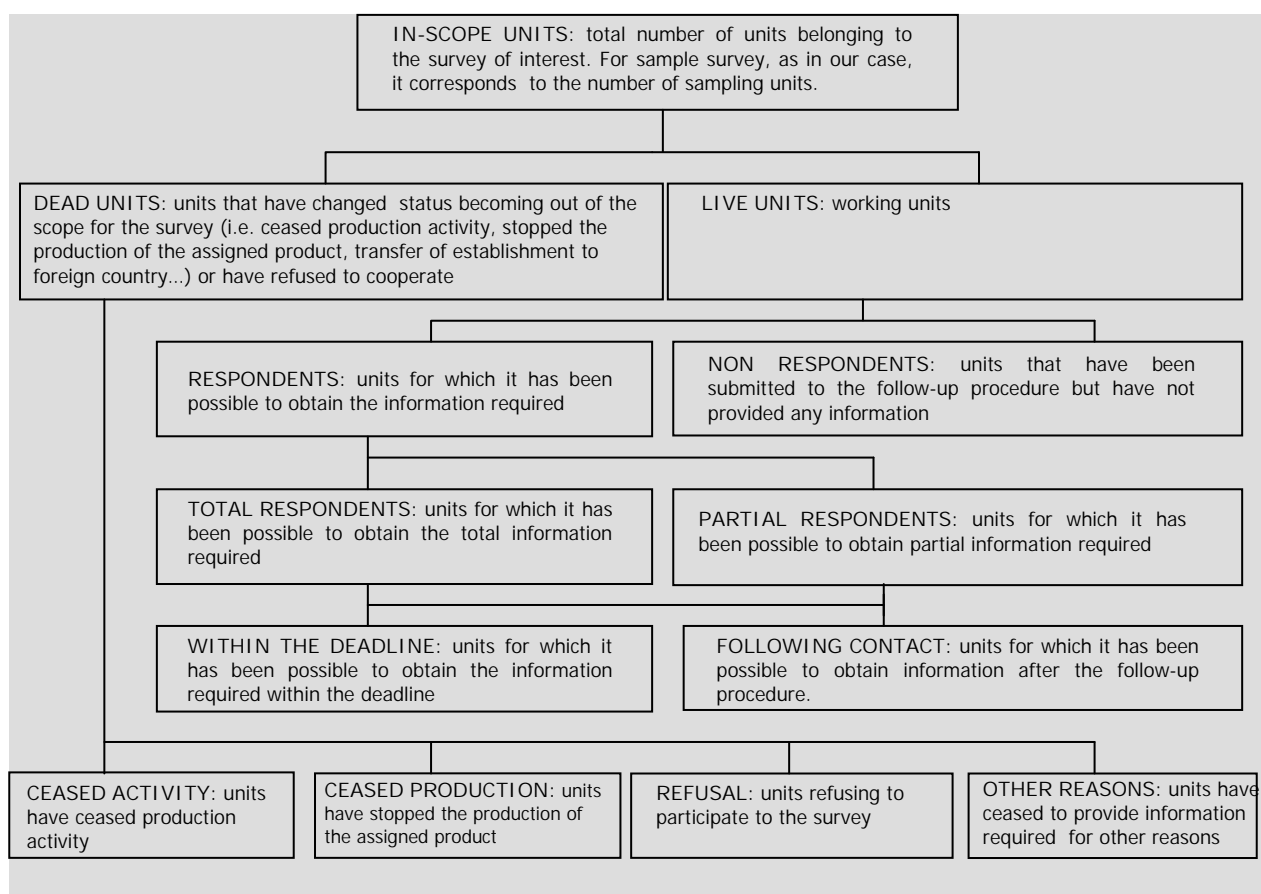
**Table 1.10.2 - Data collection indicators referred to prices**

INDICATOR	FORMULAS
<b>Collected information rate</b>	number of items for which has been possible collected information/total items *100.
<b>Non collected information rate</b>	number of items for which has not possible to collect information / total items*100
<b>Quality change rate</b>	number of items involved by quality changes /total items *100
<i>Percentage information rate</i>	
<b>‘no sale’ rate</b>	number of ‘no sale’/total items *100
<b>Prices rate</b>	number of items for which has been possible collected prices/total items *100
<i>Percentage price rate</i>	
<b>In range price rate</b>	number of items for which the prices are in range /total items *100
<b>Out range price rate</b>	number of items for which the prices are out range /total items *100
<i>Percentage quality change rate</i>	
<b>Item substitution rate</b>	number of substitute items / total items *100
<b>Unit measure change rate</b>	number of substitute items / total items *100
<b>Unit quantity change rate</b>	number of items involved by unit quantity change / total items *100
<b>Unit payment and delivery conditions change rate</b>	number of items involved by payment and delivery conditions change / total items *100
<b>Ceased item rate</b>	number of ceased quotations/total items *100

**Table 1.10.3 - Editing and imputation indicators**

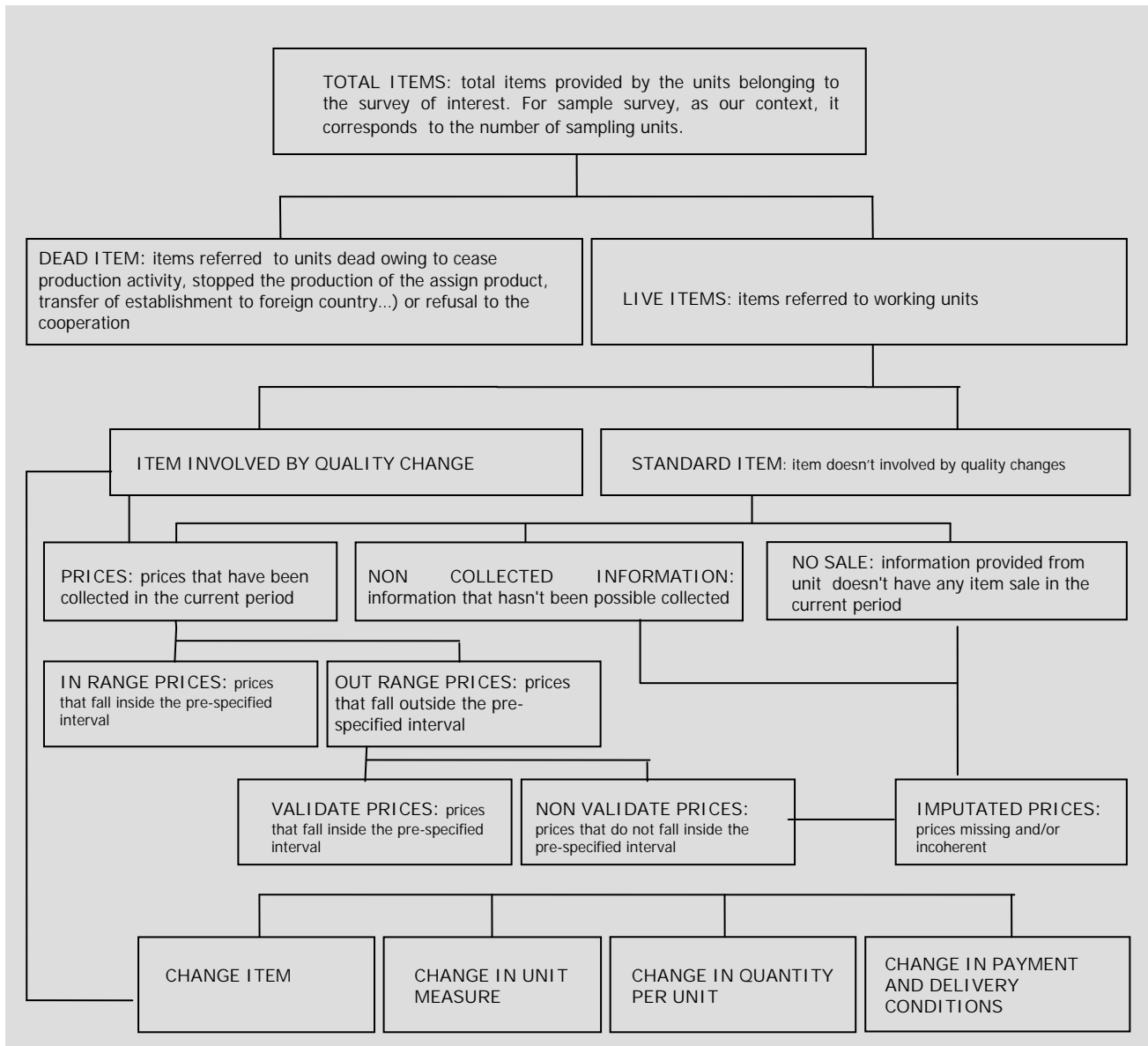
INDICATOR	COMPUTATION
Price validate rate	number of validate quotations/total prices *100
Price non validate rate	number of non validate quotations/total prices *100
Imputation rate	number of imputed prices/total prices *100

**Figure 1.10.1 - Classification and definition of the quantities needed for data collection indicators referred to enterprises**





**Figure 1.10.2 - Classification and definition of the quantities needed for data collection indicators referred to prices and editing and imputation indicators**



*1.11 Example of survey documentation*

*1.11.1 Letter of survey introduction*

COMPANY NAME

ATTN: PERSON NAME

ADDRESS CITY, PROVINCE

POSTAL CODE

DATE

Dear Sir/Madam,

the (add the name of the) NSI carries out the 'Monthly survey on producer prices of industrial products sold on domestic market' in accordance with the European Community Legislation that regulates the short-term statistics, with the purpose to measure the average price development of industrial products of domestic origin at the initial stage of commercialization on domestic market. The survey refers to a set of products of the main goods manufactured and sold on domestic market and it is based on the sample of producer enterprises.

Herein are enclosed the questionnaire C-41bis, the methodological note and a blank model to specify changes or additional new items as representative of own production.

To meet the deadline for data transmission (1 month and 15 calendar days) as required by the Regulation (EC) STS 1158/05, the respondent is requested to transmit the data within 10 days from the end of reference period.

It is a pleasure to remind that it is possible to obtain information about the work of the Institute and its services on the following web site add the web side.

Thank you very much for your co-operation.

Best regards.

Signature

### 1.11.2 *Compilation guide*

#### **I - MONTHLY QUESTIONNAIRE COMPILATION GUIDE (C-41bis)**

##### *1. Survey purpose*

The domestic output price index measures the average price development of industrial products of domestic origin at the initial stage of commercialization on domestic market. Its purpose is to provide information on business cycle movements. It is also used as a deflator, to index contracts in the private sector and as an analytical tool for business and researchers.

##### *2. Legal basis*

The producer price survey meets the requirements of the Council Regulation (EC) n. 1165/98, concerning the short-term statistics and the Council Regulation (EC) no 1158/2005, amending Council Regulation (EC) No 1165/98. The definition of short-term statistics variables are laid down in the Commission Regulation (EC) N° 1503/2006.

##### *3. Observation unit*

The observation units are the industrial enterprises whose plants have to be placed in the territorial area and its output has to be sold directly on the domestic market. Enterprises not involved in manufacturing activity are not subject to the survey (the commercial businesses are excluded).

##### *4. Analysis unit*

The analysis unit is the product-item manufactured and delivered on domestic market. The observed item (pre-filled on the questionnaire) has been selected by the enterprise, within the assigned product, according to the following rules. The item has to be:

- 4.1 the most representative item manufactured and sold on market ;
- 4.2 produced and sold on a regular basis;
- 4.3 a standard production (type products tailor-manufactured are excluded because their price would be a unique price, not comparable over the time);
- 4.4 fully identified and described in terms of the quality and transaction characteristics; and as far as possible, their quality and transaction characteristics should be unchanged over time in order to ensure comparability of the prices.

### 5. *Survey price*

The monthly observed price, relating to the product-item, must satisfy the following rules:

- 5.1 it is referred to the most usual stipulation agreements (concerning quantity, quality, package and payment) kept stable over time;
- 5.2 it is referred to the domestic production directly delivered on the domestic market;
- 5.3 it is an actual transaction price, not a list price;
- 5.4 it is calculated *ex-factory*. Ex-factory price excludes the insurances and transport costs;
- 5.5 it is referred to the moment of order not to the moment when the products leave the establishment gates;
- 5.6 it is provided in national currency.

If the enterprise has no items sale in the reference period, it is requested to provide the information, pointing out 'no' in the specific field on the questionnaire.

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It is reminded that the monthly prices must be referred to the same item and delivery condition, in order to ensure consistency from period to period.

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#### *Survey prices are not:*

- 5.7 prices referring to the domestic production directly delivered on the non-domestic market: the sales of goods manufactured by resident enterprises must be performed only on the domestic market;
- 5.8 prices referring to the product manufactured on the non-domestic market;
- 5.9 prices referring to transaction between units belonging to the same enterprise group (transfer price).

### 6. *Survey period*

The price for each selected item should be referred to the means of all transactions that took place in the reference period. When such a calculation is too complicated, the enterprise can provide the price referring to the main transaction (in terms of turnover) that took place in the reference period.

### 7. *Change of the selected items*

When the item is no longer representative or ceases to be produced or changes some of its qualitative or quantitative characteristics, the enterprise must i) communicate the new information by the *blank model* (enclosed in the survey documentation); ii) must provide for the new item the current monthly price and the previous one. The previous month price is needed for the construction of the index.

In particular, the quality changes must be carried out in the following cases:

- 7.1 item substitution when the item is no longer representative or item ceases to be produced. The enterprise proposes a new item representative of the assigned product with the same characteristics as the previous one in order to guarantee continuity in price data. The new item is the one to be priced from now onwards;
- 7.2 change of quantity unit;
- 7.3 change of unit measure;
- 7.4 change in payment and delivery conditions (payment, packing, transport costs).

### 8. *Reason for price change*

The comparison between the current and previous item price has to be specified by choosing one of the following causes:

- 1. *normal market performance*: the price change is irrelevant or it is ascribed to the normal market trend;
- 2. *reduction in price/promotion*: the price change is due to rebates or promotions;
- 3. *customer changes*: the current monthly price changes according to the quantity of goods ordered by the costumers;
- 4. *competitive factors*: the current monthly price is due to market competition, i.e. when the enterprise wants to get a new share in the market (new clients) or maintain the old shares (old clients) or beat the competitive pressure from other countries;
- 5. *material cost changes*: changes affect the current price;
- 6. *updating reference price list*: the current price is updated on the basis of the new prices list;
- 7. *end of reduction and promotion*: the transaction price comes back to the level existing before the reduction in price campaign.

Reasons for price change are useful for pre - validating data and for reducing respondent follow-up procedures with the respondents.

## II- DEADLINE AND DATA TRASSMISSION

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### ATTENTION

Before compiling questionnaire C-41bis, the respondent should do a copy of the questionnaire; then the copy has to be used for providing the requested information; finally, the respondent sends the fulfilled-in questionnaire as specified at the following part 2.

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#### 1) Deadline for monthly questionnaire transmission

Prices must be transmitted within 10 days after the end of the reference month.

#### 2) Transmission modalities:

- **e-mail:** (indicate the e-mail)
- **fax:** (indicate the number fax)
- **post:** (indicate the address)

In order to ease cooperation between the Institute and the enterprise, please keep the enterprise address and the name of the person in charge of filling the form always updated.

### 1.11.3 Survey questionnaire

LOGOS OF INSTITUTE OF STATISTICS		MONTHLY SURVEY ON PRODUCER PRICES OF INDUSTRIAL PRODUCTS SOLD ON DOMESTIC MARKET Mod. C-41					
NAME OF INSTITUTE OF STATISTICS		ENTERPRISE CODE 123456789		YEAR 2008			
PRICE STATISTICS DIVISION		Personal data of respondent		Month			
E-mail: pre-filled	Surname: pre-filled Name: pre-filled Phone: pre-filled Fax: pre-filled E – mail: pre-filled	January		February	March	April	
Address: pre-filled		May		June	July	August	
Phones: pre-filled		September		October	November	December	
Fax: pre-filled							
PLEASE SEND THE QUESTIONNAIRE BACK 10 DAYS BEFORE THE END OF CURRENT MONTH							
Product code pre-filled		Product description pre-filled					
Progressive number	Serial code	Item description (*)				Unit Measure (*)	Quantity per unit (*)
1	pre-filled	pre-filled				pre-filled	pre-filled
2	pre-filled	pre-filled				pre-filled	pre-filled
3	pre-filled	pre-filled				pre-filled	pre-filled
4	pre-filled	pre-filled				pre-filled	pre-filled
5	pre-filled	pre-filled				pre-filled	pre-filled
Changes of fields indicated with (*) must be communicate by the blank model							
Progressive number	Serial code	Sale made (indicate yes/no)	Price of previous month (in KM)	Price of current month (in KM)	If the monthly current price is not equal to the monthly one, mark with "x" the cell corresponding to the main reason for price change, [ see the reason for price change]		
1	pre-filled				① ② ③ ④ ⑤ ⑥ ⑦		
2	pre-filled				① ② ③ ④ ⑤ ⑥ ⑦		
3	pre-filled				① ② ③ ④ ⑤ ⑥ ⑦		
4	pre-filled				① ② ③ ④ ⑤ ⑥ ⑦		
5	pre-filled				① ② ③ ④ ⑤ ⑥ ⑦		
Reason for price change		4 COMPETITIVE FACTORS		6 UP-DATING REFERENCE LIST PRICE			
1	NORMAL MARKET PERFORMANCE	5 MATERIAL COSTS CHANGES		7 END OF PRICE REDUCTION/PROMOTION			
2	REDUCTION IN PRICE/PROMOTION						
3	CUSTOMER CHANGES						

## *1.12 Dissemination practices*

### *1.12.1. Publishing data*

The crucial aim of dissemination is to provide users with validated statistical data. A standard press release format is aimed at presenting comprehensible information with a level of detail not tailored on specialist users.

At European level there isn't a common set of rules to structure a press release scheme, but only some recommendations whose aim is to help users to evaluate the correspondence between data provided by Eurostat and by the NSI.

As such these requirements do not attempt to align the national press releases format among countries. Eurostat only recommends the use of footnotes or annexes in order to help the data users in reading the press release.

The aim of the recommendations on publications is not to replace the national dissemination but to assure that users can find supplementary information. Moreover, the users of the data should be made aware of the interplay of the NSI's with Eurostat in providing statistical information. The recommendations are the following:

1. Both Eurostat and the national press releases should give the primary focus to the highest aggregate of economic sectors according to the aggregation of the STS Regulation and transmitted by the Member State to Eurostat.
2. When the use of aggregates in national publications differs from the structure of the STS Regulation, such as figures for total industry including construction, these aggregations should be supplemented by figures according to the definition of sectors in the STS Regulation;
3. When national data are calculated (and disseminated in the national press release) using a different method with respect to Eurostat, differences among data provided by the NSI and Eurostat should be indicated in the footnote of the national press release (for instance, when such a differences are due to seasonal adjustments methods, the working day adjustment, etc.)
4. When data are published on the basis of different definitions compared to those of the Commission Regulations, i.e. 586/2001 and 588/2001, these differences should be stated as well.
5. A National Institute may use moving averages, such as bimonthly to bimonthly differences. In this case, the comparison of the month-to-month (quarter-to-quarter) should be given in addition.



6. For indicators for which there is no adjustment deemed useful, such as aggregated output prices, there should be growth rates for month-to-month (quarter-to-quarter) and year-to-year.
7. Year-to-year growth rate comparisons should be used for the data series. In case moving averages are used, such as two-months-to-two-months differences, the monthly (quarterly) year-to-year comparisons should be shown in addition.
8. If MIGS are calculated in a different way compared to the standard of the Commission Regulation 586/2001, the difference should be pointed out in the national Press Release;
9. If data refer to a national classification not matching those foreseen by the STS Regulation (NACE, CPA and CC), the fact should be clearly indicated and, if possible, the differences shown, for example in a methodological annex;
10. Both Eurostat and the NSI's should start indicating in their respective publication the location of where to find additional information, for example Internet.

The Eurostat and national Press Releases may show any supplementary information according to their specific preferences. The press release should include a section called “background notes” with technical information such as:

- Specification on definitions “*what are producer price*”;
- Basic quality information (accuracy, revisions);
- Methodological notes about the sample, the weights and the base used for the survey;
- The classification used;
- The publication policy;
- A friendly guide for the users to interpret the information of the tables “*how do I use the data*”.

#### *1.12.2. Data revisions*

One of the main points of criticism of the STS data is the high frequency of revisions and the absence of a common European revision policy. The proposed revision policy, of course, does not aim at impeding further revisions. On the contrary its scope is to provide Eurostat (and the users too) with the necessary information to properly face this topic.

The information on the revisions should be given with a high priority. Moreover, the necessary information about revisions should be passed together with data and in important

cases beforehand. A correct information policy related to revisions enhances the credibility of the data.

Generally there are two reasons for revisions:

1. Revisions due to “normal” statistical procedures (for instance new information available, change in the methodology, change of the base year);
2. Revisions due to the correction of errors.

Eurostat suggests the following policy for dealing with revisions:

1. The need for timely and accurate information on revisions primarily applies to gross data and working days adjusted data as specified in the Regulation, and for the correction of errors also to seasonally adjusted and trend-cycle data.
2. Corrections of errors should in principle be done as soon as possible after they are detected. This concerns all kinds of errors, statistical as well as data processing or data transmission errors. The NSI will need to judge the importance of the errors and decide on timing of the national dissemination for the error correction.
3. Detected errors in national data should be made known as soon as possible to Eurostat. Ideally, this should be done immediately after the detection. In addition, the data corrections should be communicated as soon as they have been applied to the data.
4. In case of significant errors, Eurostat must be given the possibility to inform its users about reasons and the nature of errors and to take appropriate actions. This background information on the errors and their correction should be provided together with the corrected data. Ideally, this information should be aligned with the national publication on revisions.
5. Changes in seasonally adjusted data or trend-cycle data due to the regular revision of seasonal or trend-cycle estimation are not part of the information policy on revisions. However, significant changes, for example of the method used or a fundamental readjustment of parameters should be treated like a revision.
6. For statistical data revisions, each NSI should develop a coherent revision policy with the occasions on when to apply revisions as well as a regular time pattern for the revision. This revision policy should be made known to Eurostat and should appear in the release calendar for the data supply by the NSI's.
7. Revisions apply concerning long periods should be done for entire calendar years. Successive partial revisions should be avoided.

8. Normal statistical data revisions do not require explicit information unless the degree of the revision is very high and may need to be explained to users. In that case, Eurostat should be informed about the nature of the revisions. A guideline in which case explicit information of Eurostat is required should be the perceived national need for information. When a NSI recognises such a need at national level, it should provide also Eurostat with this information. Nevertheless, it can also happen that Eurostat perceives a need for information that goes beyond the national level. In that case, the NSI must respond to a request for information by Eurostat within a short period of time.
9. At any moment, the NSI may decide to carry out a special revision for any period, in addition to the correction of errors and normal statistical data revisions. It should be subject to a prior information from the NSI to Eurostat and from Eurostat to users that covers the reasons and information on the impact of the revision on the data. NSI's and Eurostat should only use this possibility for well-founded reasons, such as change of base year, change of methodology, etc.
10. The revisions should not cause differences in the data published in electronic form by Eurostat and the Member State concerned. This implies that revisions have to be transmitted to Eurostat no later than they are released at the national level.

### *1.12.3 Publishing timetable*

In order to be aligned to the standard timeliness the NSI should provide a detailed timetable for publishing the PPI using a press release. This monthly time table must be planned at the end of the year and for the whole following year.

The standard information about this timetable foresees the identification of the index denomination (for instance: Producer Price Index), date and time of the releases, the publishing flag (provisional or final), the revision policy and other information about possible press briefing linked to the release.

### *1.13 Press Release*

A press release standard foresees a document made up of two main parts: tables of results, graphs and short comments to highlight the current month results and their evolution measured in terms of month to month and twelve-month rates of change. Moving averages, time series indices and methodological notes are also included in the press release.

A BiH press release proposal is shown below (see p. 67). It's content concerns the main aggregate indices for FBiH, RS and the District of Brcko. Results have been presented in terms of NACE sectors of economic activity and by MIGs (Main Industrial Groupings) classification.



# Press Release

## Producer Prices Index for Industrial Products

June 2008

In the Bosnia Herzegovina (BiH) the output price index for home sales of manufactured products (base Dec 2007=100) results 112,3 rising 2,1 per cent on previous month and 12,2 per cent in the year to May.

The output price index excluding energy and petroleum rose 3,2 per cent on previous month and 11,2 per cent in the year to May.

The average difference in the first six months of the year rising 0,4 per cent on six months of the previous year.

In the Bosnia Herzegovina Federation (FBiH) the output price index for home sales of manufactured products (base Dec 2007=100) results 109,8 rising 3,1 per cent on previous month and 9,8 per cent in the year to May.

In the Sprska Republic (RS) the output price index for home sales of manufactured products (base Dec 2007=100) results 111,7 rising 1,1 per cent on previous month and 11,5 per cent in the year to May.

For Brcko district the output price index for home sales of manufactured products (base Dec 2007=100) results 154,4 decreasing 1,6 per cent on previous month and rising 54,2 per cent in the year to May.

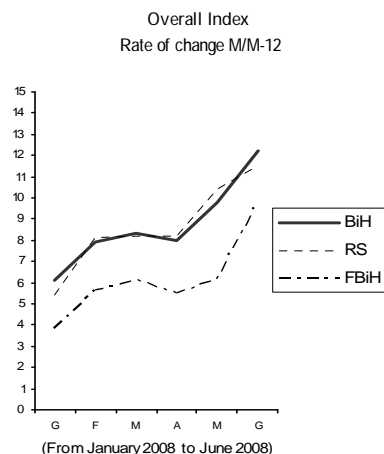


Table 1. Index of Producer Prices for Industrial Products (base December 2007=100). June 2008

	INDEX	Percentage changes		
		June 2008	<u>Jun 08</u> May 08	<u>Jun 08</u> Jun 07
BiH	112,3	+ 2,1	+ 12,2	+ 8,7
FBiH	109,8	+ 3,1	+ 9,8	+ 6,2
RS	111,7	+ 1,1	+ 11,5	+ 8,6
BRCKO	154,4	- 1,6	+ 54,2	+ 47,3

(a) Six-months-on-six-months average difference.

*Analysis by MIG'S (Main Industrial Groupings) classification*

In the Bosnia Herzegovina (BiH) there isn't variation on the previous month for energy and capital goods; there are variations for consumer goods (minus 0,1 per cent) and the intermediate goods (plus 5,9 per cent).

In the Bosnia Herzegovina (BiH) there are the following variation in the year to May: intermediate goods plus 18,2 per cent, consumer goods plus 10,8 per cent (durables plus 1,3 per cent, non durables plus 11,6 per cent), capital goods plus 2,1 per cent, and for energy plus 8,8 per cent.

In the first six months of the 2008, the most relevant variation on the same period of the previous year results from the intermediate group (plus 11,3 per cent).

Table 2. BiH - Index of Producer Prices for Industrial Products by MIG'S classification (base December 2007=100). June 2008

Main Industrial Groupings	INDEXES		Percentage changes	
	June 2008	Jun 08 May 08	Jun 08 Jun 07	Jan 08-Jun 08 (a) Jan 07-Jun 07
Consumer goods	111,1	- 0,1	+ 10,8	+ 9,2
Consumer durables	102,4	0,0	+ 1,3	+ 1,2
Consumer non durables	111,8	- 0,1	+ 11,6	+ 9,8
Capital goods	103,0	0,0	+ 2,1	+ 2,0
Intermediate goods	124,5	+ 5,9	+ 18,2	+ 11,3
Energy	102,4	0,0	+ 8,8	+ 7,0
Overall Index	112,3	+ 2,1	+ 12,2	+ 8,7

(a) Six-months-on-six-months average difference.

*Analysis by sector of economic activity*

The most relevant sector in terms of rising both on previous month and in the year to May is *metal and metal products* (on previous month plus 12,4 per cent, in the year to May plus 29,7 per cent).

In terms of decreasing on previous month the sectors are only *wood and wooden articles (excluding furniture)* (minus 0,4 per cent) and *chemical products and synthetic fibres* (minus 0,1 per cent).

In terms of decreasing in the year to May the sectors are only *textile products, clothing* (minus 3,2 per cent) and *chemical products and synthetic fibres* (minus 2,1 per cent).

The most relevant average difference in the first six months of the year results by sector *food, beverages and tobacco* rising 14,4 per cent on six months of the previous year.

Table 3. BiH - Index of Producer Prices for Industrial Products by sector of economic activity (base December 2007=100). June 2008

SECTOR	INDEXES	Percentage changes		
	June 2008	<u>Jun 08</u> May 08	<u>Jun 08</u> Jun 07	<u>Jan 08-Jun 08</u> Jan 07-Jun 07
C. Minerals	106,7	+ 0,2	+ 5,9	+ 5,7
DA Food, beverages and tobacco	117,7	0,0	+ 16,2	+ 14,4
DB Textile products, clothing	95,5	0,0	- 3,2	- 4,2
DC Leather, leather and hide articles	100,9	+ 0,2	+ 1,8	+ 1,5
DD Wood and wooden articles (excluding furniture)	106,4	- 0,4	+ 5,3	+ 5,6
DE Paper and publishing	101,4	+ 0,2	+ 0,7	+ 0,8
DF Coke, petroleum products	122,1	+ 3,7	+ 20,3	+ 11,3
DG Chemical products and synthetic fibres	99,2	- 0,1	- 2,1	- 1,5
DH Rubber and plastic products	101,6	0,0	+ 0,9	+ 2,9
DI Non metal minerals	121,3	+ 3,1	+ 9,9	+ 12,6
DJ Metal and metal products	137,3	+ 12,4	+ 29,7	+ 11,1
DK Machinery and mechanical equipment	104,8	0,0	+ 0,1	+ 0,8
DL Electrical machinery, electrical and optical	117,9	+ 2,2	+ 18,6	13,6
DM Means of transport	103,1	0,0	+ 2,9	+ 2,8
DN Other products or Manufacturing industries (including furniture)	107,6	+ 2,0	+ 5,6	+ 2,7
E. Electricity, gas, water	99,8	0,0	+ 9,4	+ 7,0
Overall Index	112,3	+ 2,1	+ 12,2	+ 8,7

(a) Six-months-on-six-months average difference.

#### *1.14 Concluding comments*

The results of this joint work clearly show that the major aims of the PPI Sub-component have been achieved. In conclusion, the BiH Agency for Statistics is now able to provide a monthly PPI by merging the Entities indices.

At the same time, the Entities SIs can provide their respective users a set of indices in line with the European standards.

However, some topics were not dealt with. In particular the following themes were not treated during the project but could be appropriately considered in the near future:

1. the changeover to NACE Rev. 2;
2. the non-domestic component of the producer price index;
3. backcasting topics.



## **2. BiH Producer price indices (December 2006 – June 2008)**

### *2.1 Main criteria for checking data quality*

In order to respect the quality requirement planned for the survey, in terms of accuracy and reliability of the indexes, following the collection of the data it is necessary to check the database. This phase is called data analysis and it involves an adjustment on the time series of data collecting. This adjustment is necessary on one side to verify the results of the survey plan and correction phase; on the other side, to correct possible inconsistency of the data with hypothesis fixed during the survey design.

The data quality check has been performed on the data provided by each Entity SI for the period December 2006 - June 2008. In particular, from December 2006 to December 2007 the data quality check has been carried out by Istat experts whether the price changes (from the previous to the current month) fall outside a some predefined range (filtering method). On the contrary, from January 2008 to June 2008 the check and validation phases have been carried out directly by each Entity SI by using the “PPI Aplikacija” software provided. In order to make the checking procedure referring at each (item) quotation prices as clearer as possible, the adopted system of hypothesis foresees the following actions:

Range 1: Monthly percentage changes = 0

Reason: prices are stable for all the investigated (inspected) period.

Action: validated without corrections.

Range 2: Monthly percentage changes < ±15%

Reason: the price variation are ascribed to the normal market trend.

Action: validated without corrections.

Range 3:  $\pm 15\% < \text{Monthly percentage changes} < \pm 30$

Reasons:

- only one price lies outside the range: updating reference price list or reduction in price (only if there is a temporary reduction in price, then the price level comes back to the previous one).
- more than one prices lies outside the range: normal market trend

Action: validated without corrections.

Range 4: Monthly percentage changes > ± 50%

Reasons:

- only one price lies outside the range: quality change or typing error

Action: quality change or corrections

- more than one price lies outside the range: anomalous prices; in the case of large and recurrent variations ( $> \pm 100$ ), it has been decided to delete the item.

Action: it has been decided to delete the item.

The following tables show the outcome of the analysis (in absolute figures and in percentage) in accordance with the methods and the hypotheses described above. In particular the results for FBiH and RS are the following:

**Table 2.1.1 - FBiH and RS item's percentage of flags**

	stable price	normal market trend	reduction in price	updating price	quality change	double quality change	quality change + anomalous prices	anomalous prices	typing error	elimination
FBiH	1113	375	4	134	78	2	3	19	3	2
RS	340	297	9	117	137	12	14	12	7	36

**Table 2.1.2 - FBiH item's percentage of flags by NACE DIVISION**

DIV	stable price	normal market trend	reduction in price	updating price	quality change	double quality change	quality change + anomalous prices	anomalous prices	typing error	elimination	Total
10	2,25	0,81	-	-	-	-	-	-	-	-	3,05
14	4,09	1,04	-	0,63	0,35	-	-	-	-	-	6,11
15	10,66	4,84	0,17	2,94	2,71	-	0,06	0,35	0,06	-	21,79
16	0,86	-	-	-	-	-	-	-	-	-	0,86
17	0,98	-	-	-	-	-	-	-	-	-	0,98
18	2,54	0,17	-	0,23	0,12	-	-	-	-	-	3,05
19	2,36	0,46	-	0,17	0,12	0,06	-	0,23	-	-	3,40
20	8,07	2,02	-	0,58	0,17	-	-	-	0,12	-	10,95
21	1,50	0,75	-	0,23	-	-	0,06	-	-	0,06	2,59
22	4,50	0,40	-	0,06	0,06	-	-	0,06	-	-	5,07
23	0,06	-	-	0,12	-	-	-	-	-	-	0,17
24	3,23	1,38	-	0,81	0,29	-	0,06	0,12	-	-	5,88
25	3,80	0,86	0,06	0,12	-	0,06	0,06	0,06	-	-	5,01
26	5,01	2,94	-	0,75	0,06	-	0,06	-	-	-	8,82
27	0,23	0,63	-	0,12	0,06	-	-	-	-	-	1,04
28	3,80	0,92	-	-	0,12	-	-	0,12	-	0,06	5,01
29	0,69	0,40	-	0,29	-	-	-	-	-	-	1,38
30	0,06	-	-	-	-	-	-	-	-	-	0,06
31	0,29	0,06	-	0,06	0,06	-	-	-	-	-	0,46
33	0,06	-	-	-	-	-	-	-	-	-	0,06
34	0,46	1,15	-	0,06	-	-	-	-	-	-	1,67
36	8,65	1,73	-	0,58	0,40	-	-	0,17	-	-	11,53
40	-	1,04	-	-	-	-	-	-	-	-	1,04
Total	64,15	21,61	0,23	7,72	4,50	0,12	0,17	1,10	0,17	0,12	100

**Table 2.1.3 - RS item's percentage of flags by NACE DIVISION**

DIV	stable price	normal market trend	reduction in price	updating price	quality change	double quality change	quality change + anomalous prices	anomalous prices	typing error	elimination	Total
10	0,10	0,21	-	0,10	-	-	-	-	-	-	0,41
13	0,21	0,10	0,10	-	-	-	-	-	-	-	0,41
14	1,45	0,83	0,10	0,52	1,04	0,10	-	-	-	0,10	4,04
15	7,98	10,57	0,31	4,56	5,18	-	0,11	0,52	0,10	0,62	29,22
16	0,41	0,10	-	-	-	-	-	-	-	-	0,52
17	0,83	0,10	0,10	0,10	0,10	-	-	-	-	-	1,24
18	0,31	0,52	0,10	0,21	0,73	-	0,22	0,10	-	0,21	1,97
19	0,62	0,10	-	-	0,21	-	0,11	-	-	-	0,93
20	4,25	4,04	-	1,55	2,59	0,41	0,33	0,20	-	0,72	13,16
21	0,31	0,93	-	0,21	-	0,10	-	-	-	-	1,55
22	2,80	1,97	-	0,52	0,73	-	-	0,10	-	0,10	6,11
23	0,10	0,52	0,21	0,62	0,10	-	-	-	-	0,41	1,55
24	2,49	1,14	-	0,31	0,31	-	-	0,10	-	-	4,35
25	1,35	0,52	-	0,41	0,41	-	0,11	0,31	-	0,10	3,01
26	1,97	1,97	-	0,73	0,62	0,21	-	0,10	0,21	-	5,80
27	0,31	0,52	-	0,10	0,10	-	-	0,10	-	-	1,14
28	1,35	2,90	-	0,41	0,62	0,10	0,11	0,10	0,21	0,51	6,11
29	0,93	0,31	-	0,10	-	-	-	-	-	-	1,35
30	0,10	0,10	-	-	0,10	-	-	0,31	-	-	0,62
31	1,04	0,31	-	0,41	0,41	0,10	-	0,10	-	0,10	2,49
32	0,31	-	-	0,10	0,10	-	-	-	-	0,10	0,52
33	0,52	0,31	-	0,10	0,10	0,10	-	-	0,21	0,10	1,35
34	0,21	0,31	-	0,21	0,10	-	-	-	-	-	0,83
35	0,10	-	-	-	-	-	-	-	-	0,10	0,21
36	4,87	0,83	-	0,62	0,83	0,10	-	0,20	-	0,31	7,77
37	0,21	1,14	-	0,21	0,62	-	-	-	-	-	2,18
40	0,10	0,41	-	-	0,41	-	-	0,20	-	0,21	1,35
Total	35,23	30,78	0,93	12,12	15,44	1,24	0,09	2,48	0,73	3,73	100

Concerning the corrections, the following procedure has been adopted:

- Anomalous price: in this case the price carrying forward the last price has been adopted.
- Quality change: in this case the overlapping method has been applied.

Finally the item has been deleted when it was not possible to operate any adjustment (the profile of the time series is too much variable). Another cause of elimination of the item refers to a mismatching error from the PRODCOM NP code of the product collected to the code of the sources used for weighting scheme.

## *2.2 General remarks concerning PPI*

From December 2006, the PPI started at Entity and State level too. The aim of this brief note is to introduce a graphic reading of the PPI Sub-component results.

It's worth noting that the results are net of the quality check work carried out by the Italian and the Entities statisticians (respectively, sub-period December 2006 – December 2007, sub-period January – June 2008).

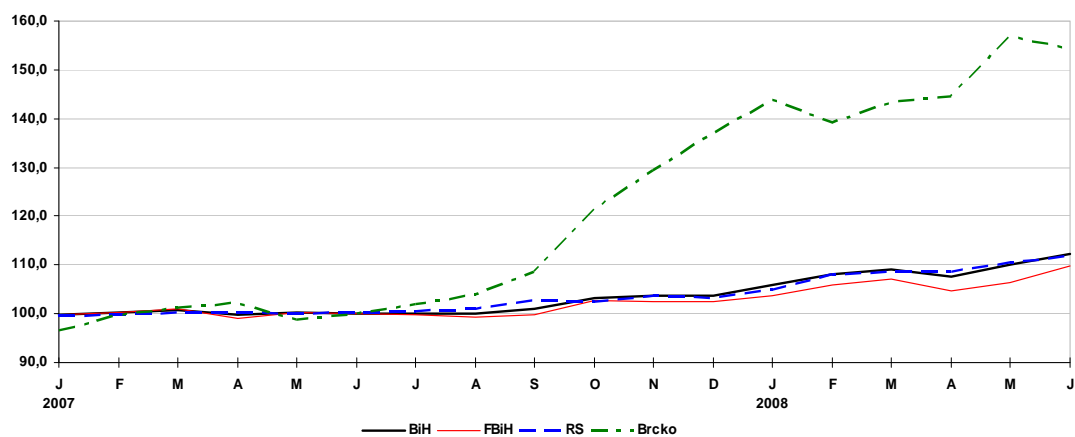
Furthermore in the first sub-period a number of stable prices characterised indices. The second sub-period shows a higher volatility in the indices profile, also reflecting the results of the follow up procedures with the respondents. Such an approach was not allowed when checking data in the desk work (first sub-period).

Indices from December 2006 up to December 2007 are compiled adopting as a reference base December 2006. From January 2008, the indices calculation base is December 2007 while the reference base is December 2006. The Tables 1.1, 1.2 and 1.5.2 show that between December 2007 and January 2008 the units flow (products) are actually negligible and, as such, not affecting indices and their rates of change.

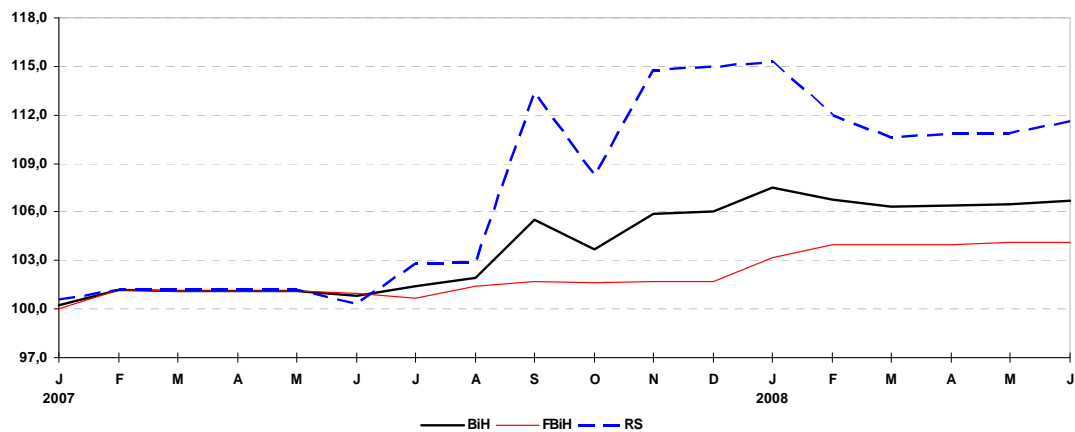
Looking at the graphic indices in 2008, the BiH Sub-section DJ shows an high (twelve-month) rate of change, surveyed in June (+ 29,7%). Such a rate of change is the result (weighted according to an arithmetic mean) of the Entities SIs rates of change (+ 38,3% FBiH and + 17,2% RS). It is worthwhile to note that the DJ twelve-month rates of change show in 2008 and for both the Entities SIs an increasing monotonic trend. A similar analysis can be made referring the Sub-section DF, whose twelve-month rate of change in June is equal to + 20,3% for BiH and, respectively for FBiH and RS, + 49,2% and + 5,5%. This last result confirms, in general, that the BiH rates of change in 2008 are firstly affected by the volatility shown by the FBiH indices. As mentioned above, such a difference seems to suggest a different approach in carrying out the PPI surveys.

2.3 Graphical analysis by entities (period 2006 – 2007)

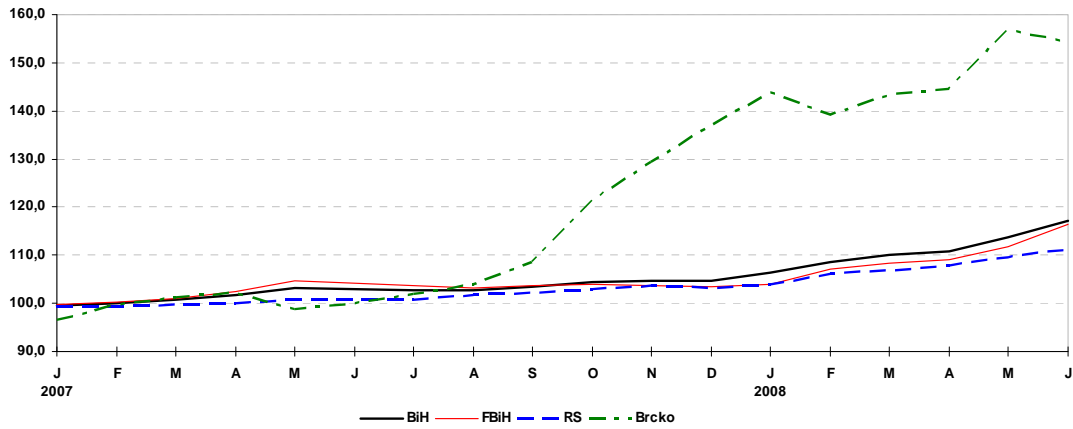
**Graph 1 – Producer Price, Overall Indices Year 2007 – 2008** (monthly data, base Dec. 2006 =100)



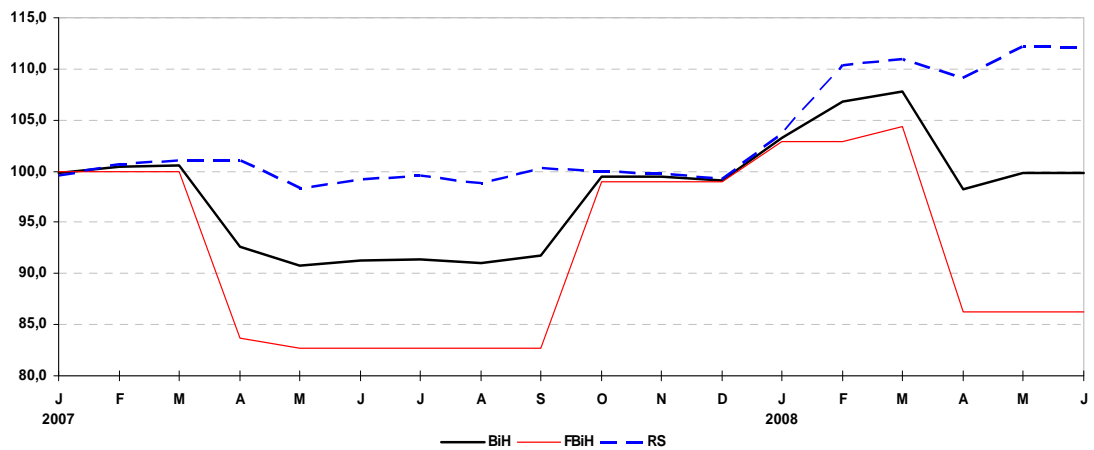
**Graph 2 - Producer Price, Section C indices. Year 2007 – 2008** (monthly data, base Dec. 2006=100)



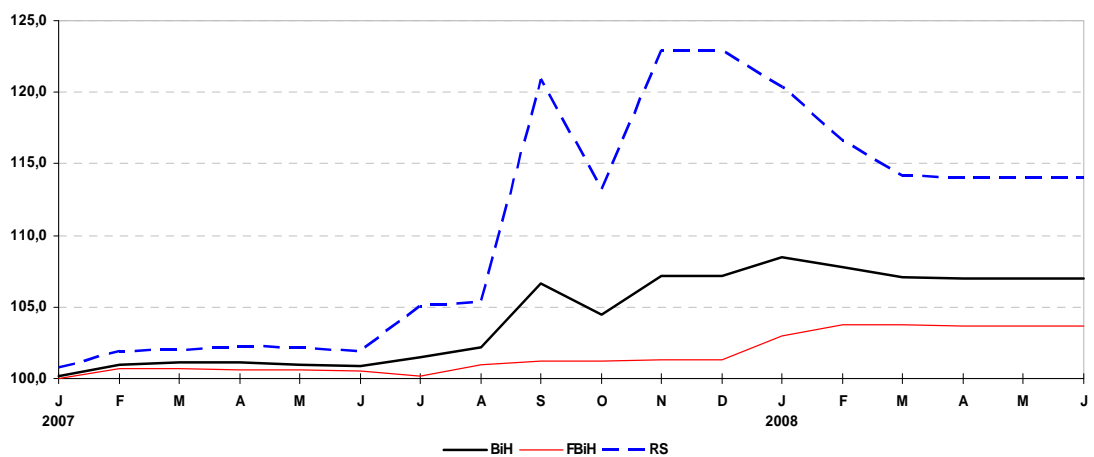
**Graph 3 - Producer Price, Section D indices. Year 2007 – 2008 (monthly data, base Dec. 2006=100)**



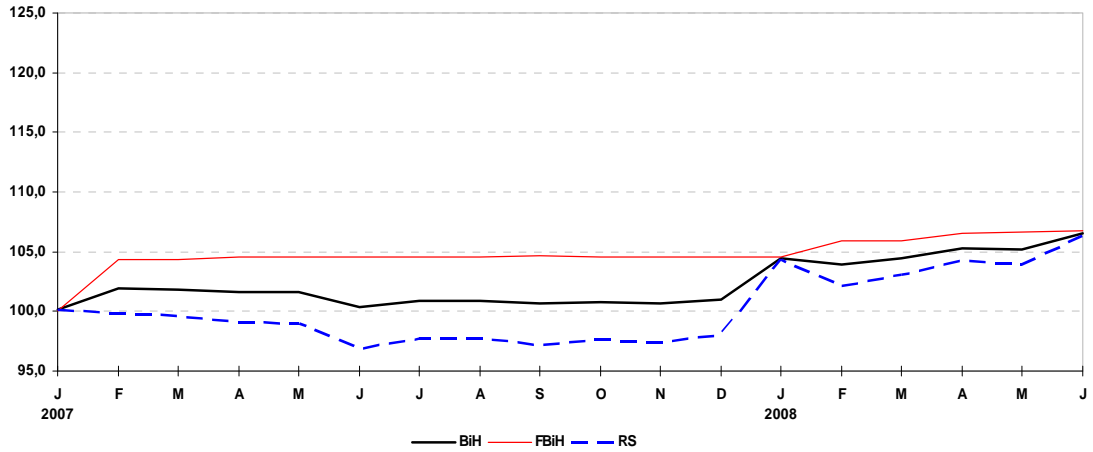
**Graph 4 - Producer Price, Section E indices. Year 2007 – 2008 (monthly data, base Dec. 2006=100)**



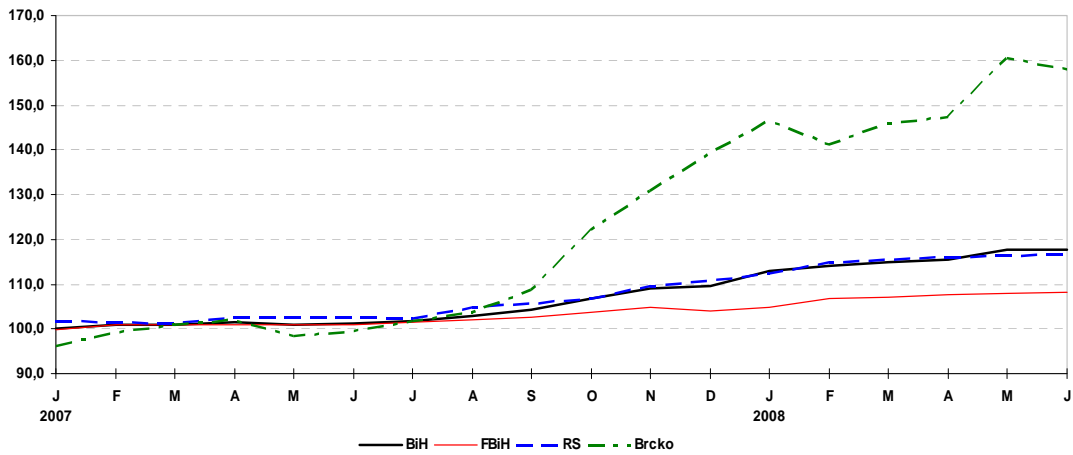
**Graph 5 - Producer Price, Subsection CA indices. Year 2007 – 2008 (monthly data, base Dec. 2006=100)**



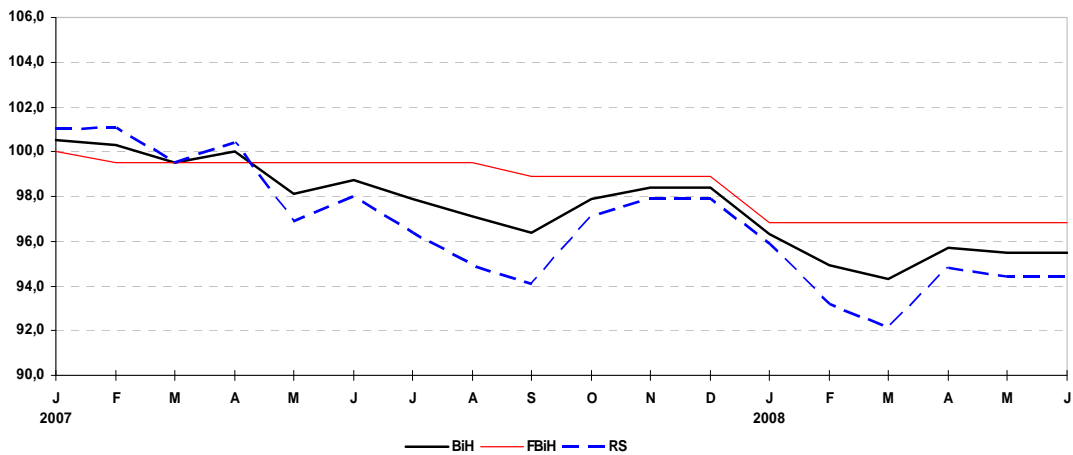
**Graph 6 - Producer Price, Subsection CB indices. Year 2007 – 2008 (monthly data, base Dec. 2006=100)**



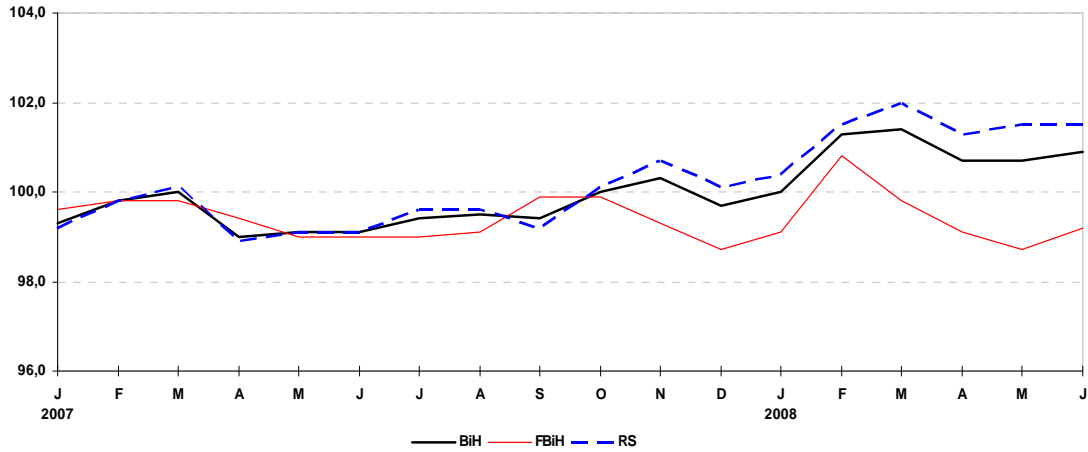
**Graph 7 - Producer Price, Subsection DA indices. Year 2007 – 2008 (monthly data, base Dec. 2006=100)**



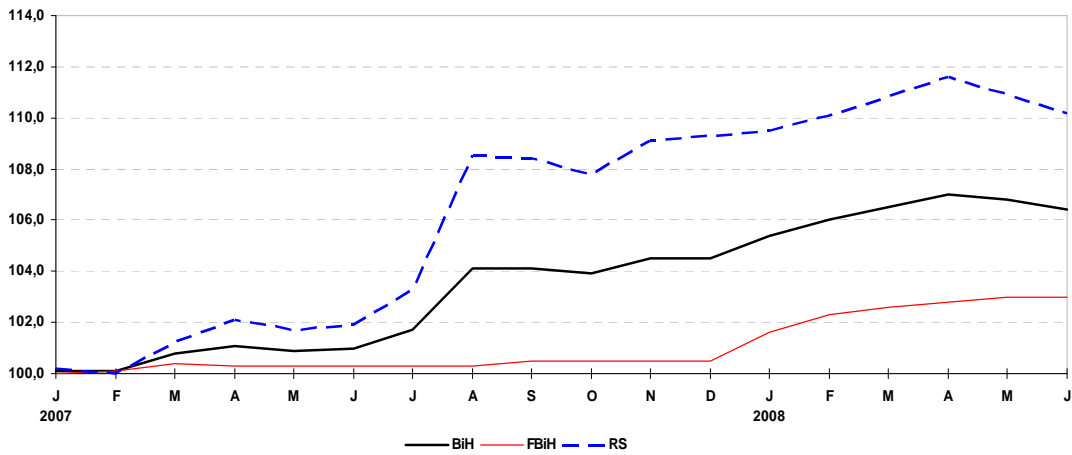
**Graph 8 - Producer Price, Subsection DB indices. Year 2007 – 2008 (monthly data, base Dec. 2006=100)**



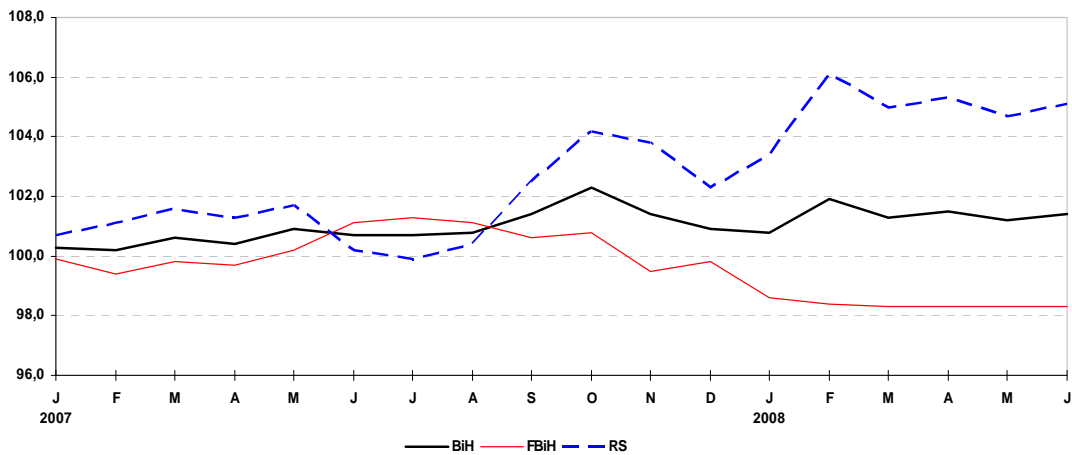
**Graph 9 - Producer Price, Subsection DC indices. Year 2007 – 2008 (monthly data, base Dec. 2006=100)**



**Graph 10 - Producer Price, Subsection DD indices. Year 2007 – 2008 (monthly data, base Dec. 2006=100)**

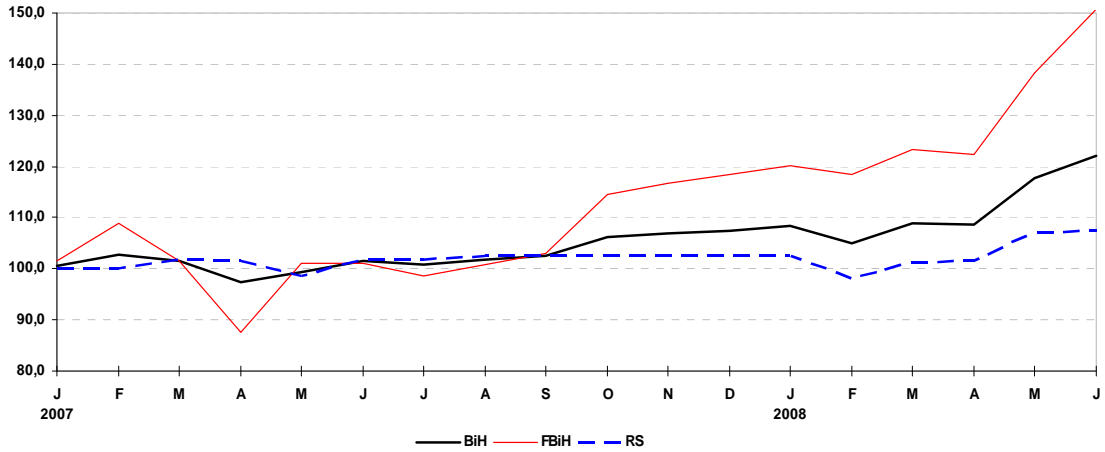


**Graph 11 - Producer Price, Subsection DE indices. Year 2007–2008 (monthly data, base Dec. 2006=100)**

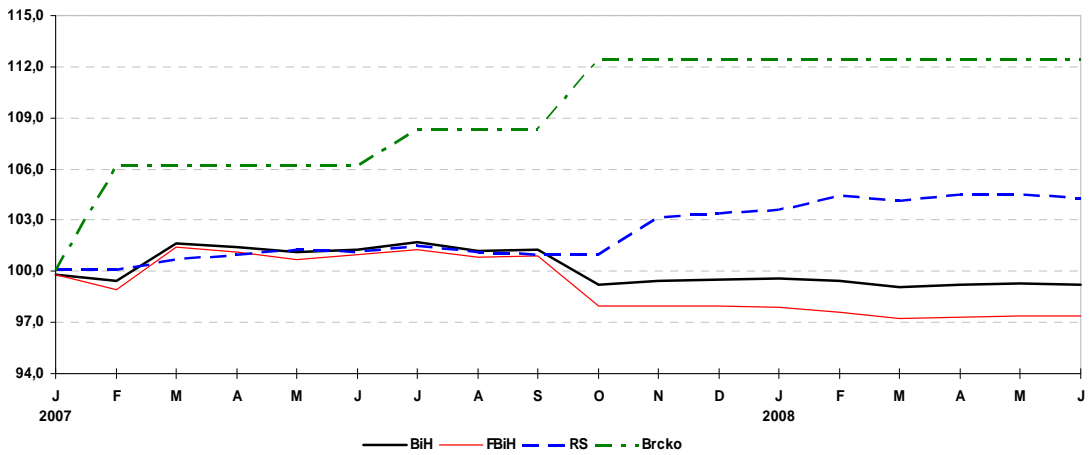




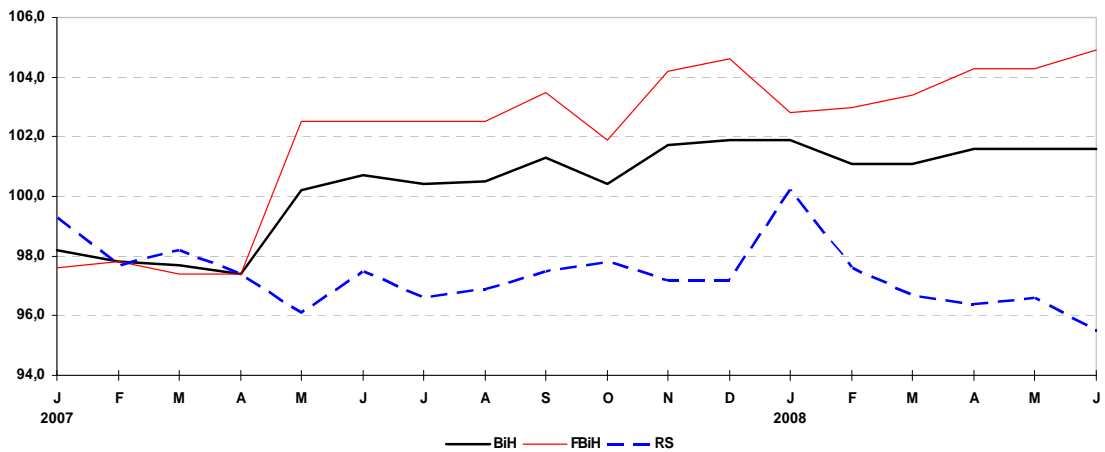
**Graph 12 - Producer Price, Subsection DF indices. Year 2007 – 2008 (monthly data, base Dec. 2006=100)**



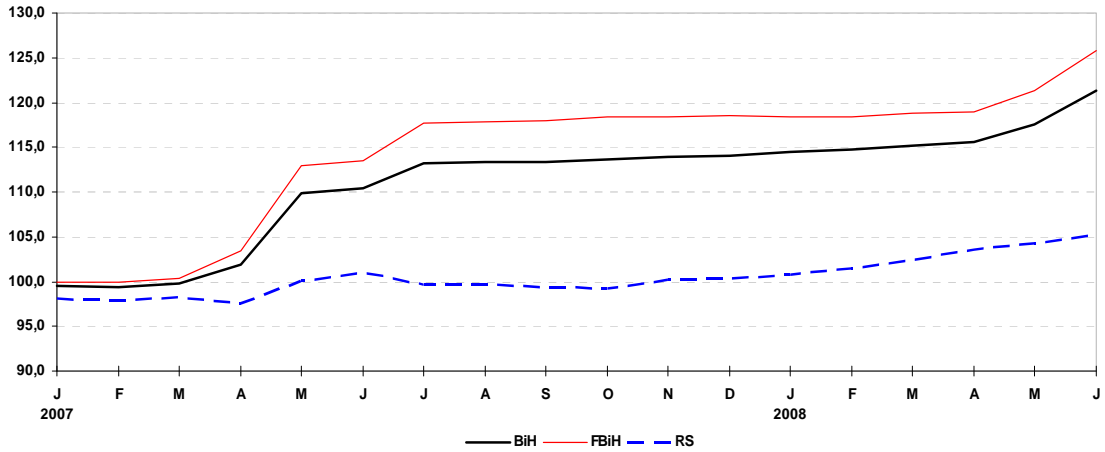
**Graph 13 - Producer Price, Subsection DG indices. Year 2007 – 2008 (monthly data, base Dec. 2006=100)**



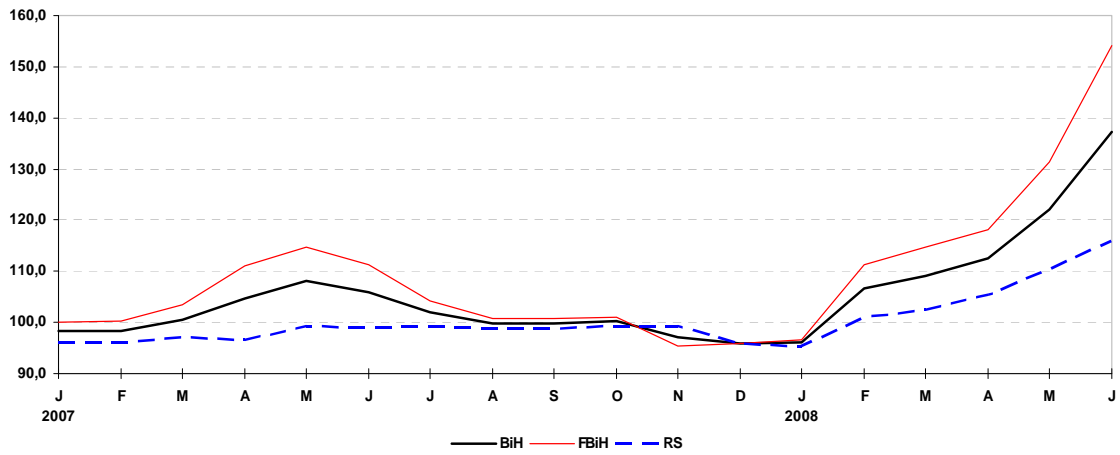
**Graph 14 - Producer Price, Subsection DH indices. Year 2007 – 2008 (monthly data, base Dec. 2006=100)**



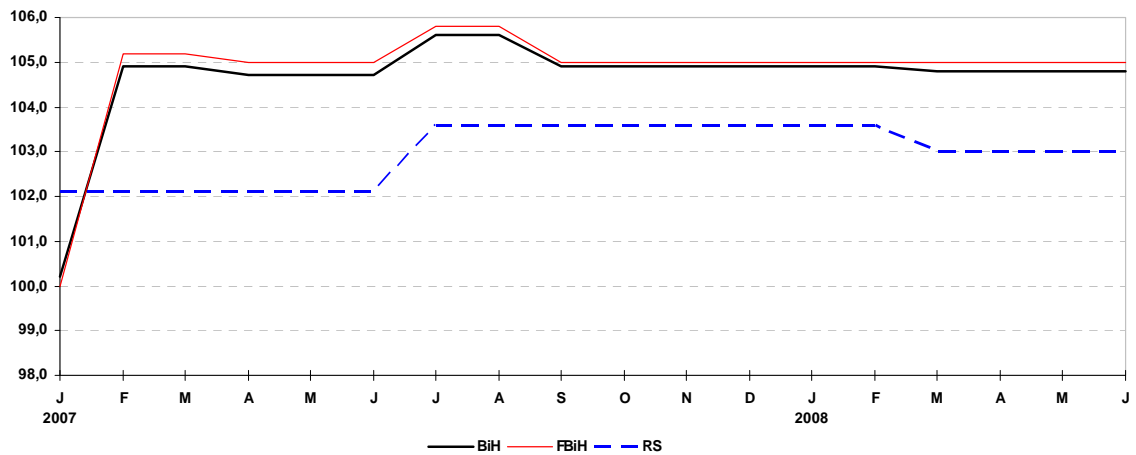
**Graph 15 - Producer Price, Subsection DI indices. Year 2007 – 2008 (monthly data, base Dec. 2006=100)**



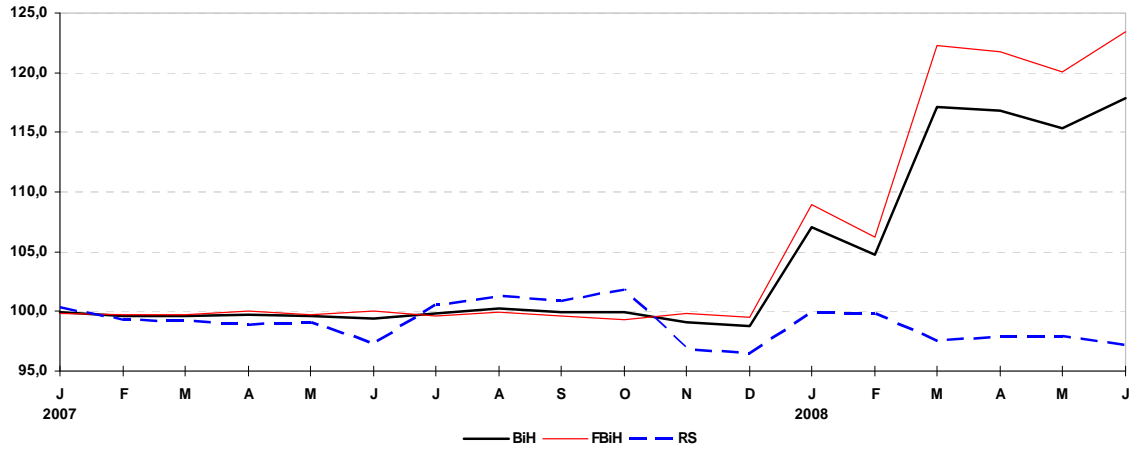
**Graph 16 - Producer Price, Subsection DJ indices. Year 2007 – 2008 (monthly data, base Dec. 2006=100)**



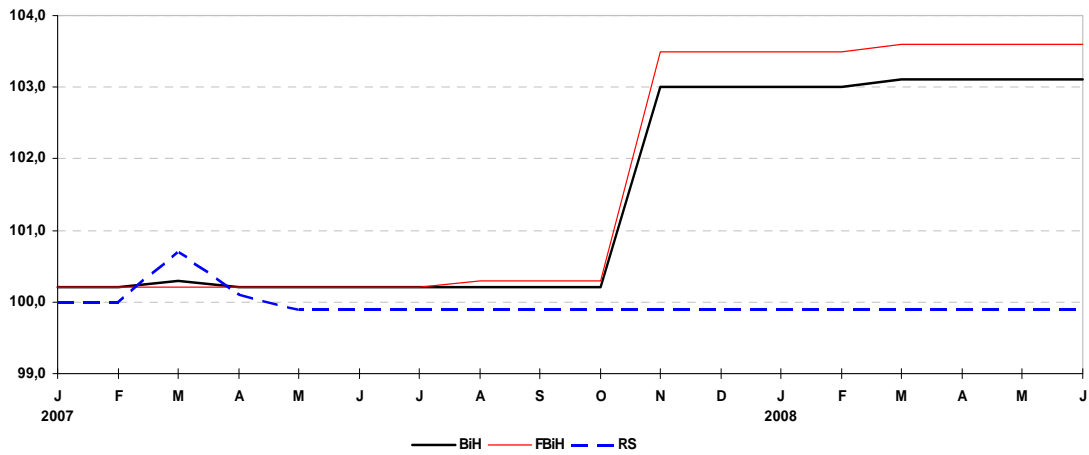
**Graph 17 - Producer Price, Subsection DK indices. Year 2007 – 2008 (monthly data, base Dec. 2006=100)**



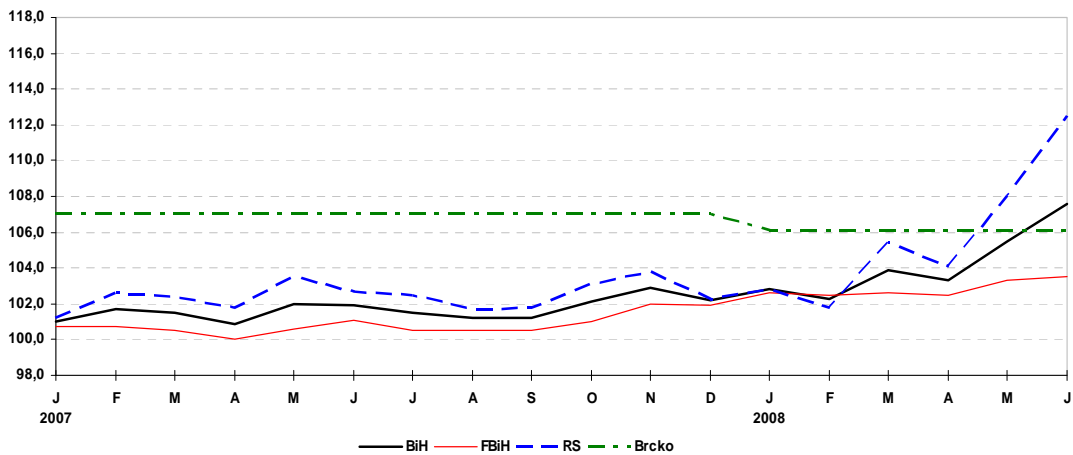
**Graph 18- Producer Price, Subsection DL indices. Year 2007 – 2008 (monthly data, base Dec. 2006=100)**



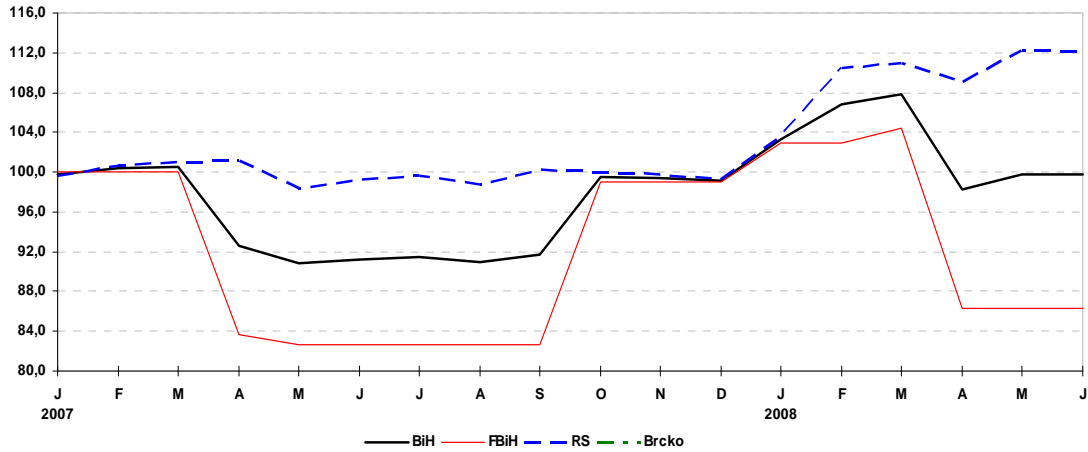
**Graph 19 - Producer Price, Subsection DM indices. Year 2007 – 2008 (monthly data, base Dec. 2006=100)**



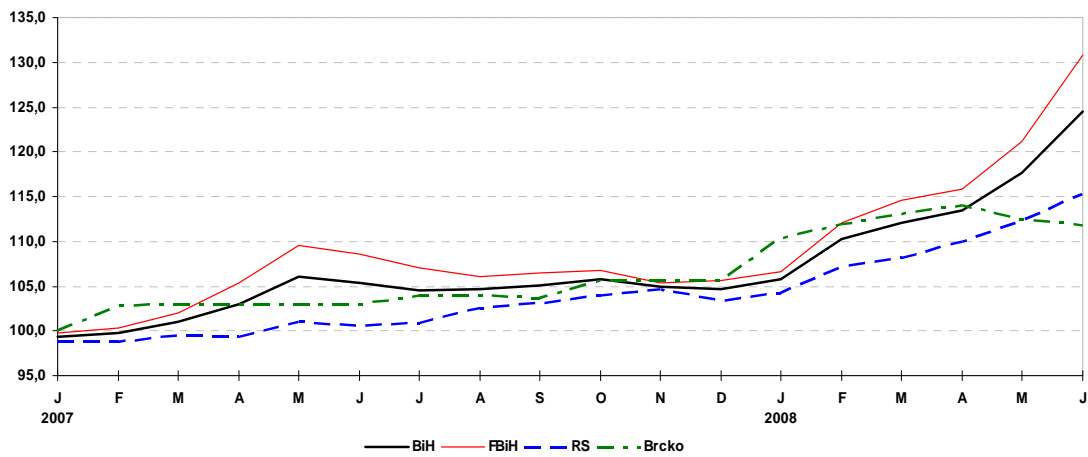
**Graph 20 - Producer Price, Subsection DN indices. Year 2007 – 2008 (monthly data, base Dec. 2006=100)**



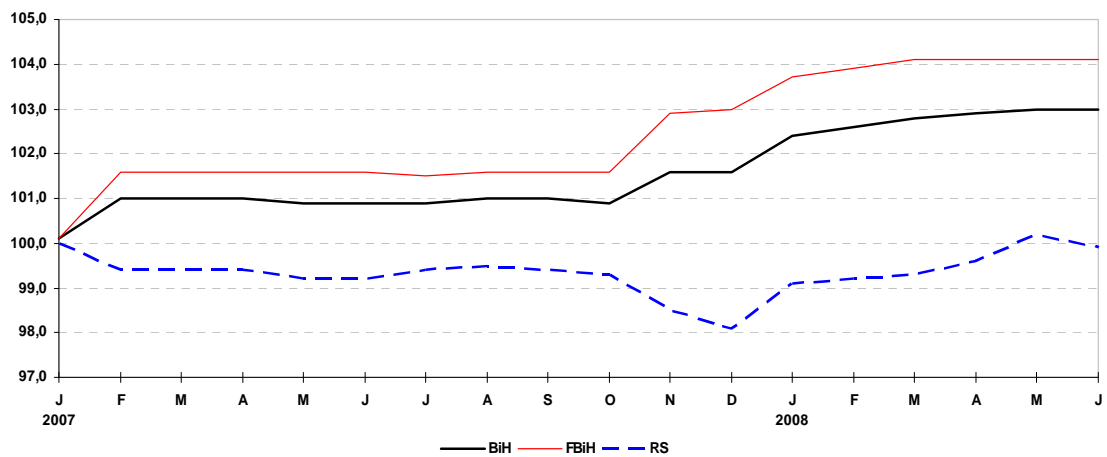
**Graph 21 - Producer Price, Subsection EA indices. Year 2007 – 2008 (monthly data, base Dec. 2006=100)**



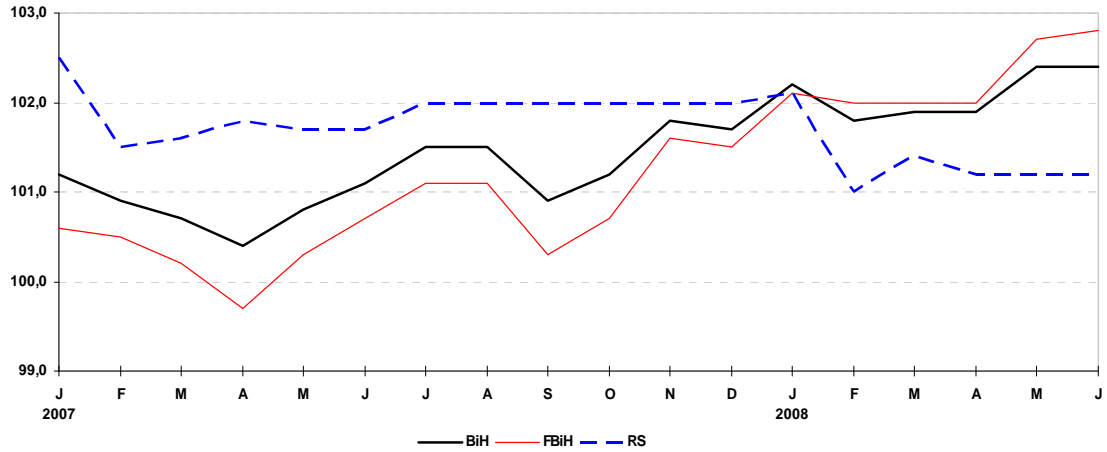
**Graph 22 - Producer Price, Intermediate goods industries indices. Year 2007 – 2008 (monthly data, base Dec. 2006=100)**



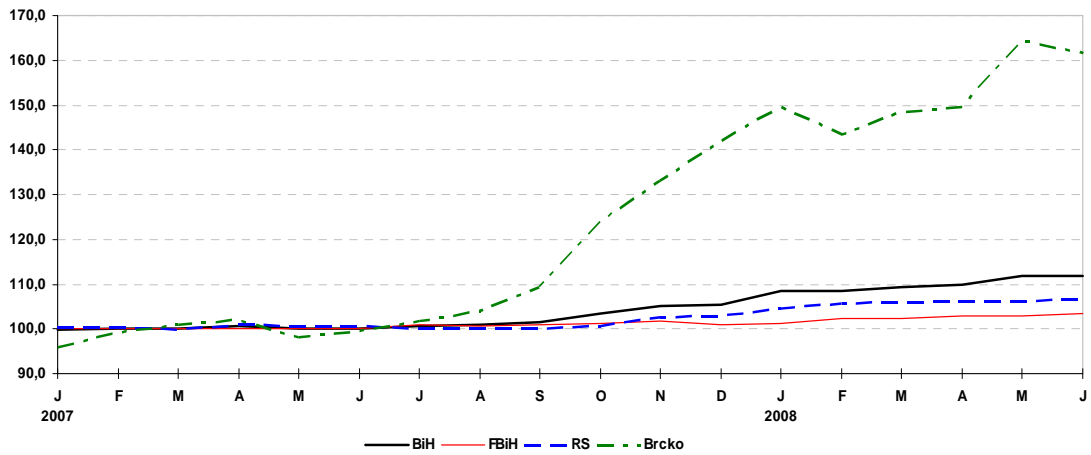
**Graph 23 - Producer Price, Capital goods industries indices. Year 2007 – 2008 (monthly data, base Dec. 2006=100)**



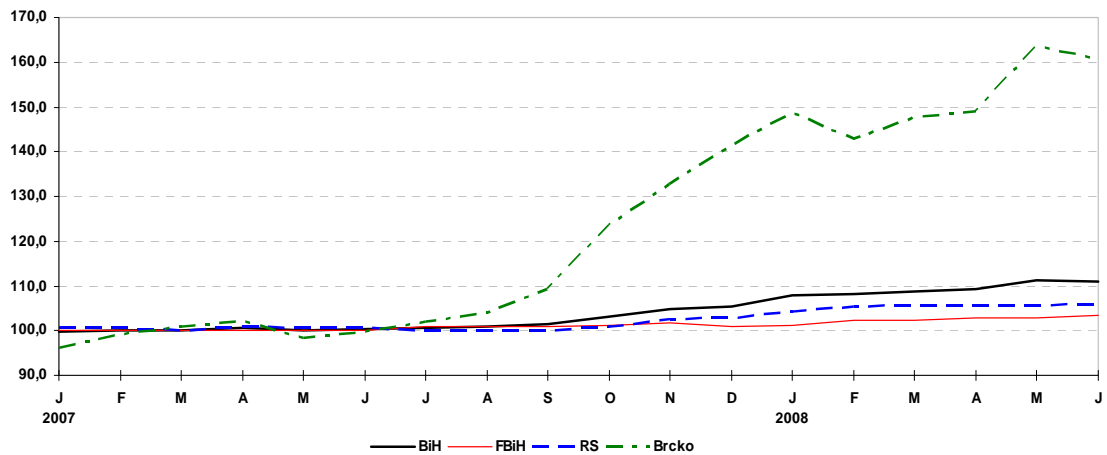
**Graph 24 - Producer Price, Durable consumer goods indices. Year 2007 – 2008 (monthly data, base Dec. 2006=100)**



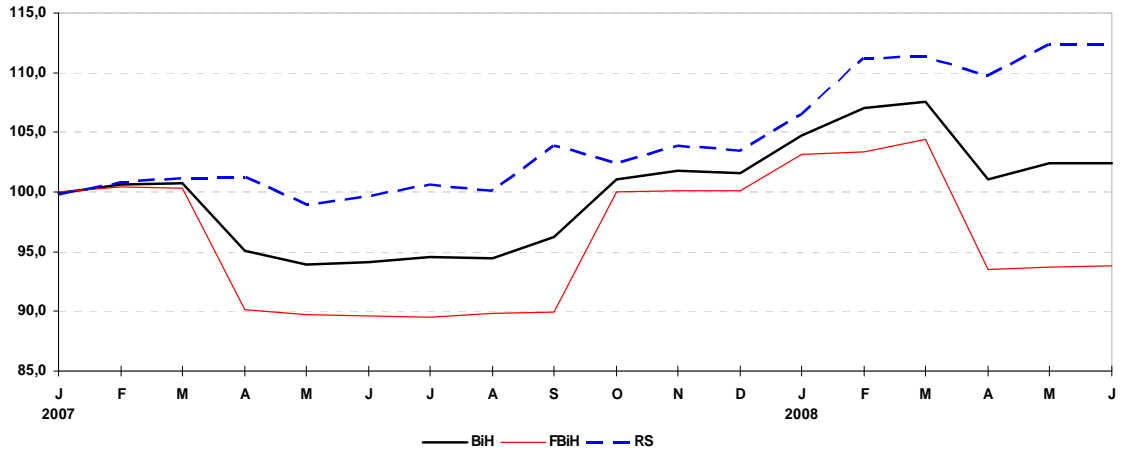
**Graph 25 - Producer Price, Non-durable consumer goods indices. Year 2007 – 2008 (monthly data, base Dec. 2006=100)**



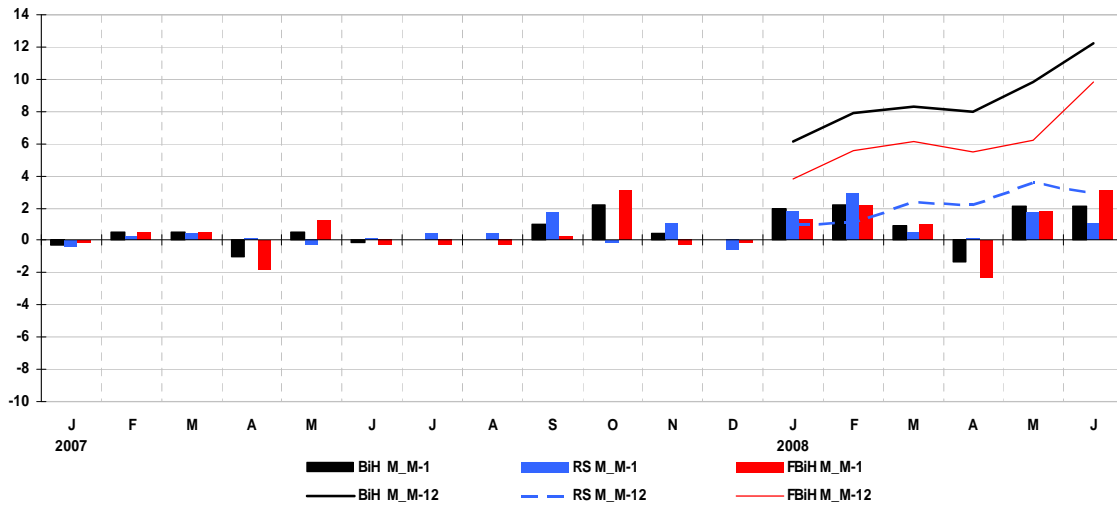
**Graph 26 - Producer Price, Consumer goods indices. Year 2007 – 2008 (monthly data, base Dec. 2006=100)**



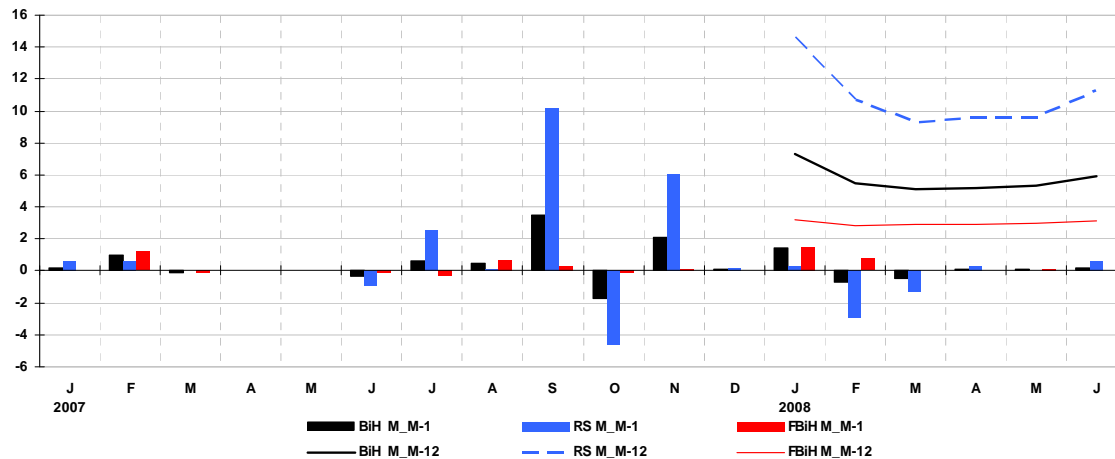
**Graph 27 - Producer Price, Energy indices. Year 2007 – 2008 (monthly data, base Dec. 2006=100)**



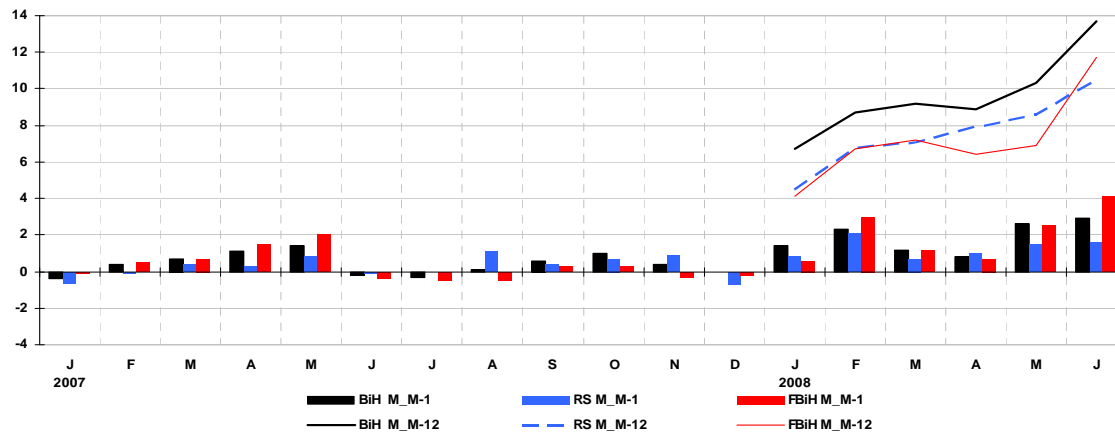
**Graph 28 – Producer Price, Overall rates of change by Entities. Year 2007 – 2008 (base Dec. 2006 =100)**



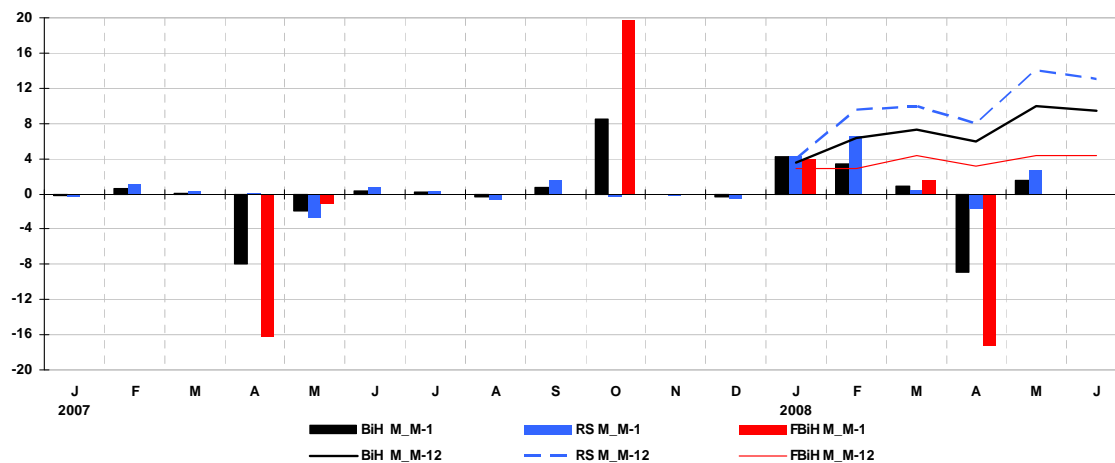
**Graph 29 – Producer Price, Section C rates of change by Entities. Year 2007 – 2008 (base Dec. 2006 =100)**



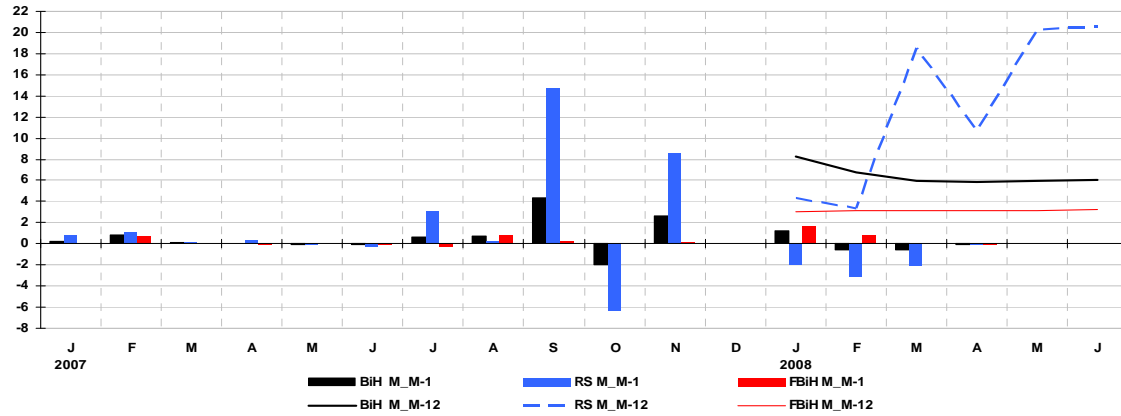
**Graph 30 – Producer Price, Section D rates of change by Entities. Year 2007 – 2008 (base Dec. 2006 =100)**



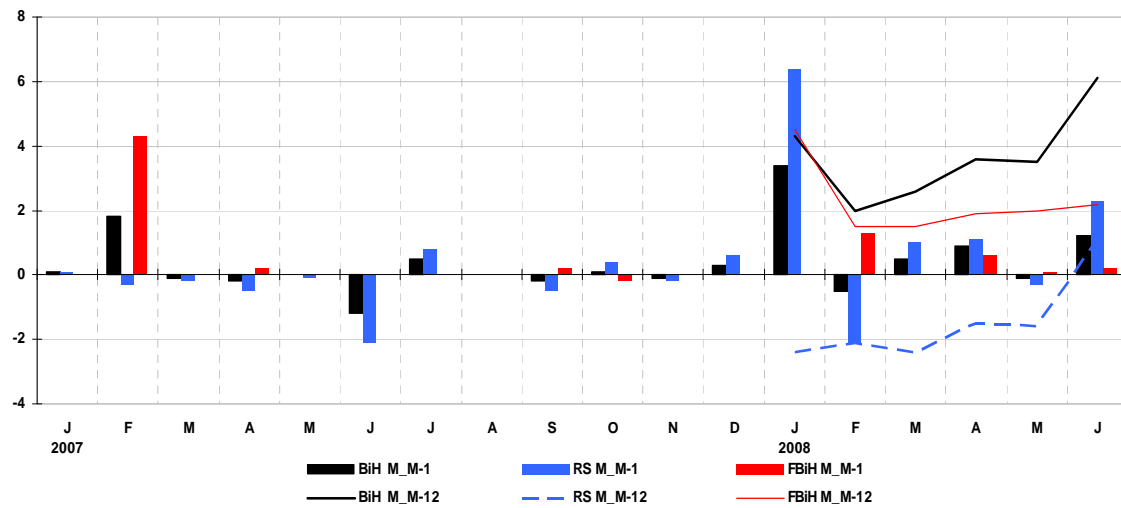
**Graph 31 – Producer Price, Section E rates of change by Entities. Year 2007 – 2008 (base Dec. 2006 =100)**



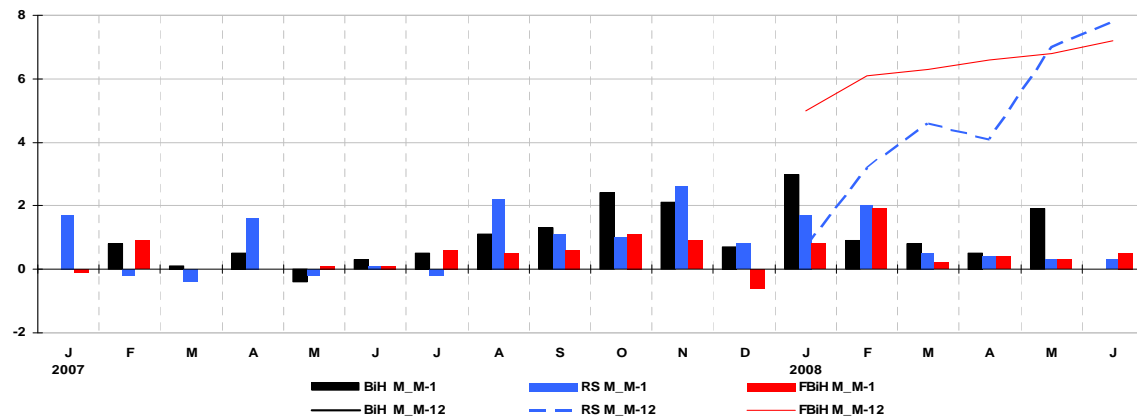
**Graph 32 – Producer Price, Subsection CA rates of change by Entities. Year 2007–2008  
(base Dec. 2006 =100)**



**Graph 33 – Producer Price, Subsection CB rates of change by Entities. Year 2007 – 2008  
(base Dec. 2006 =100)**

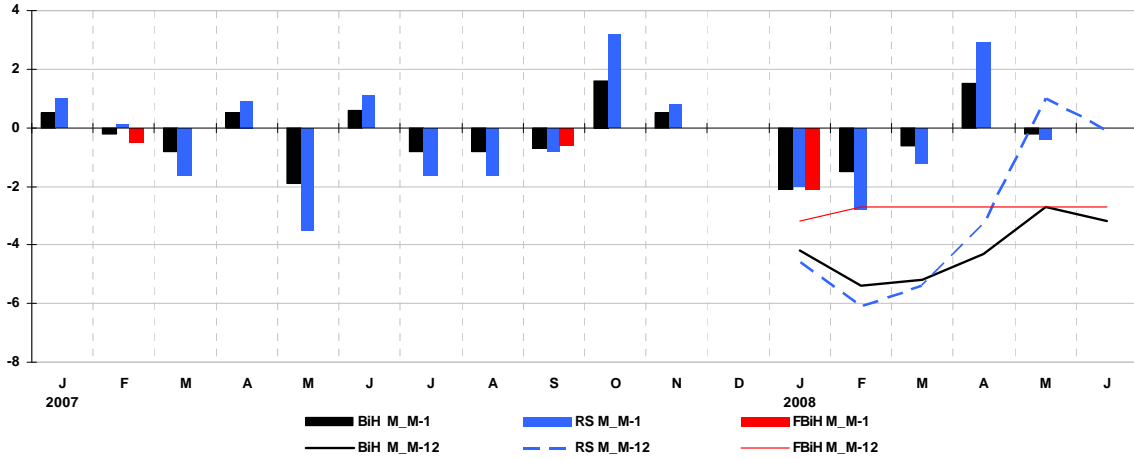


**Graph 34 – Producer Price, Subsection DA rates of change by Entities. Year 2007 – 2008  
(base Dec. 2006 =100)**

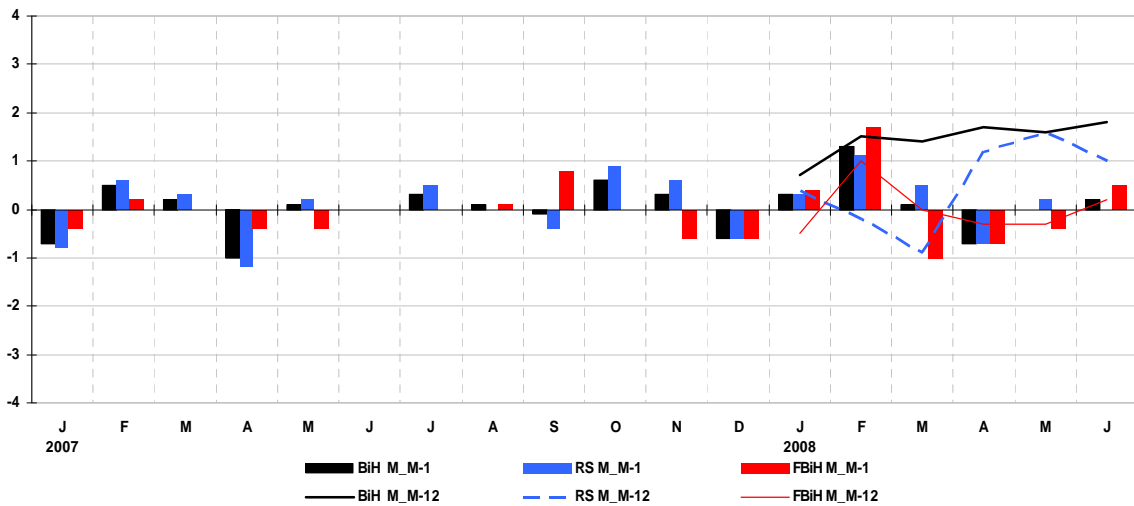




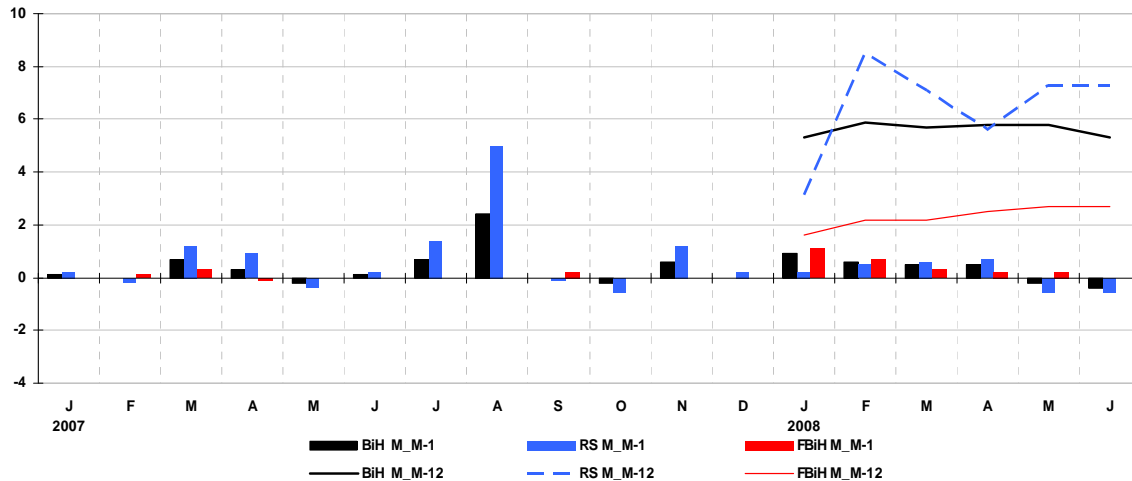
**Graph 35 – Producer Price, Subsection DB rates of change by Entities. Year 2007 – 2008  
(base Dec. 2006 =100)**



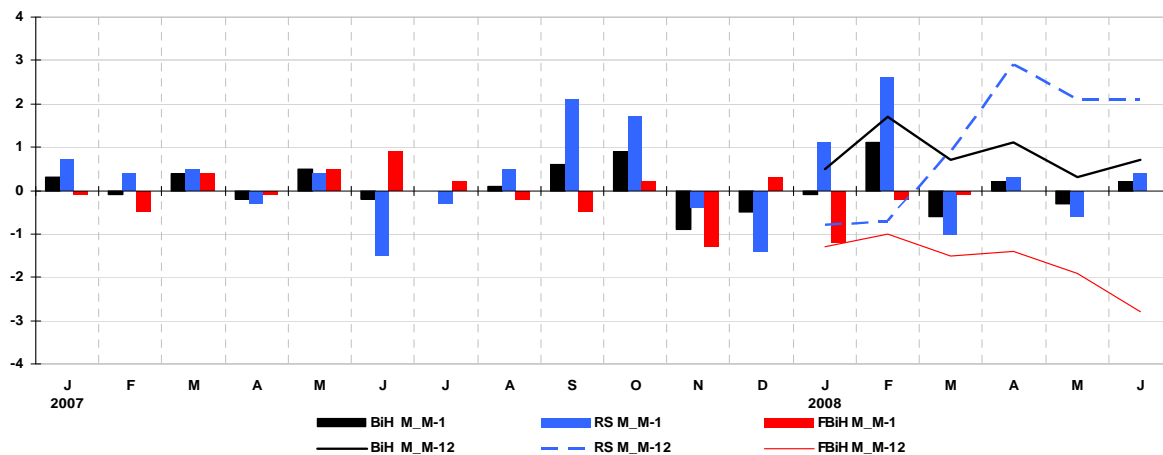
**Graph 36 – Producer Price, Subsection DC rates of change by Entities. Year 2007 – 2008  
(base Dec. 2006 =100)**



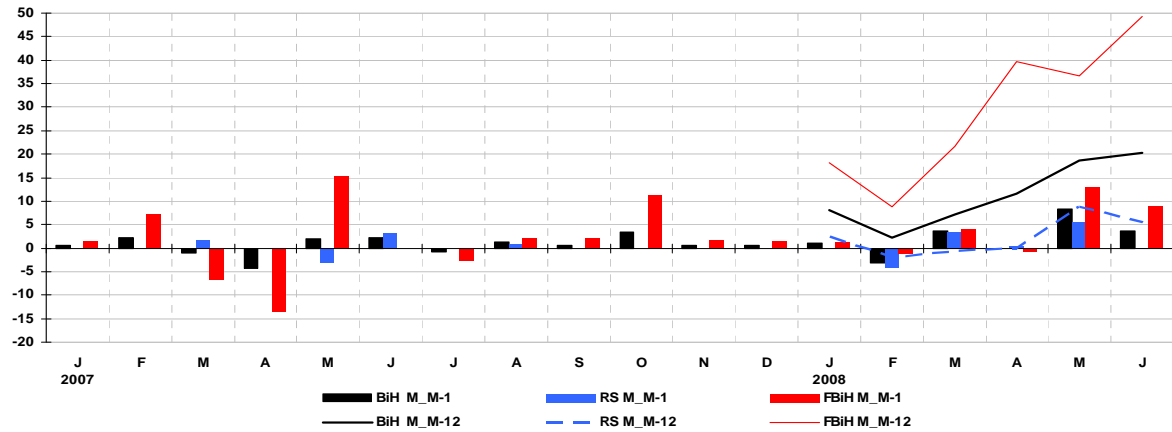
**Graph 37 – Producer Price, Subsection DD rates of change by Entities. Year 2007 – 2008  
(base Dec. 2006 =100)**



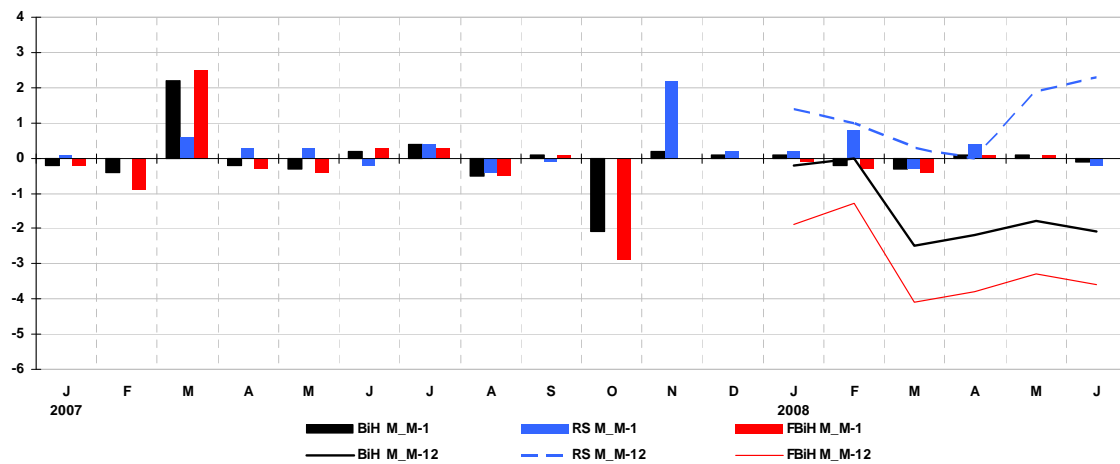
**Graph 38 – Producer Price, Subsection DE rates of change by Entities. Year 2007 – 2008  
(base Dec. 2006 =100)**



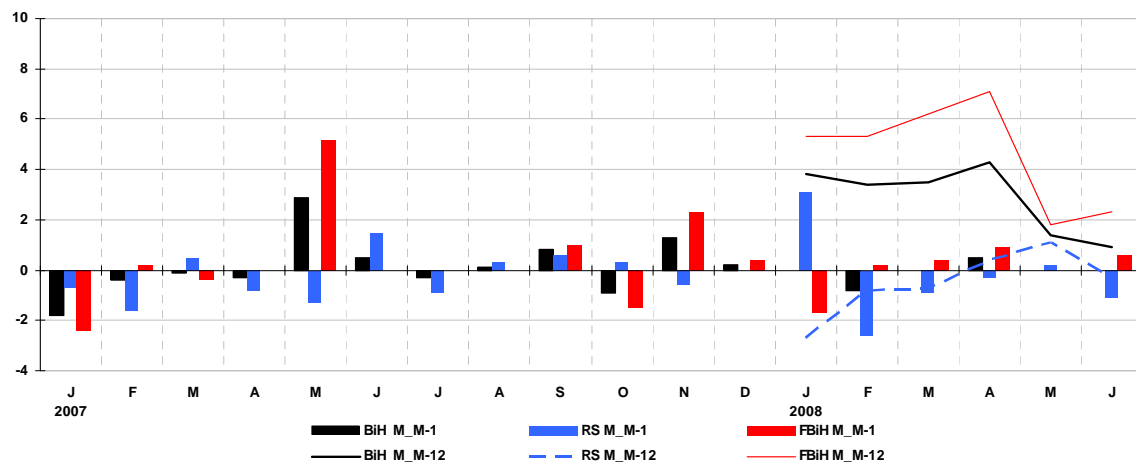
**Graph 39 – Producer Price, Subsection DF rates of change by Entities. Year 2007 – 2008 (base Dec. 2006 =100)**



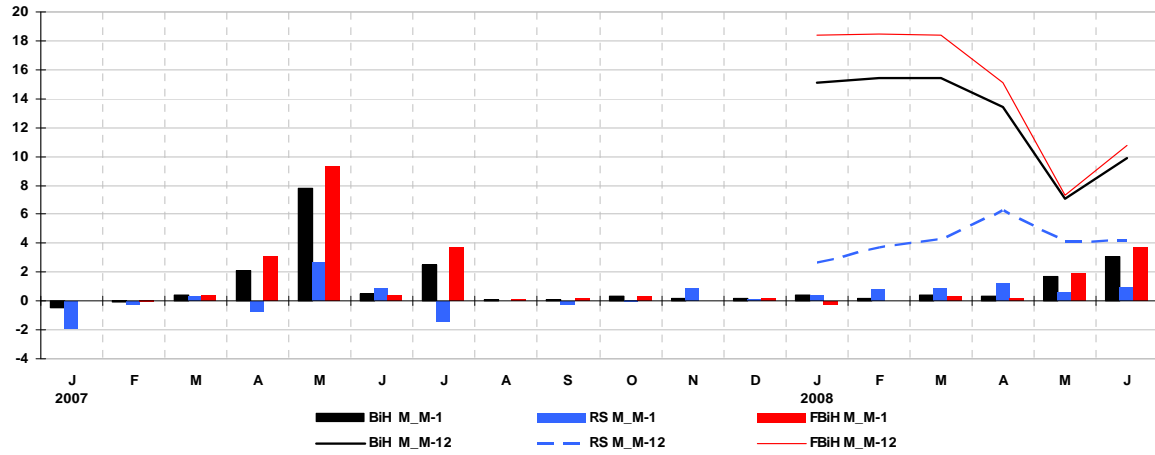
**Graph 40 – Producer Price, Subsection DG rates of change by Entities. Year 2007 – 2008 (monthly data, base Dec. 2006 =100)**



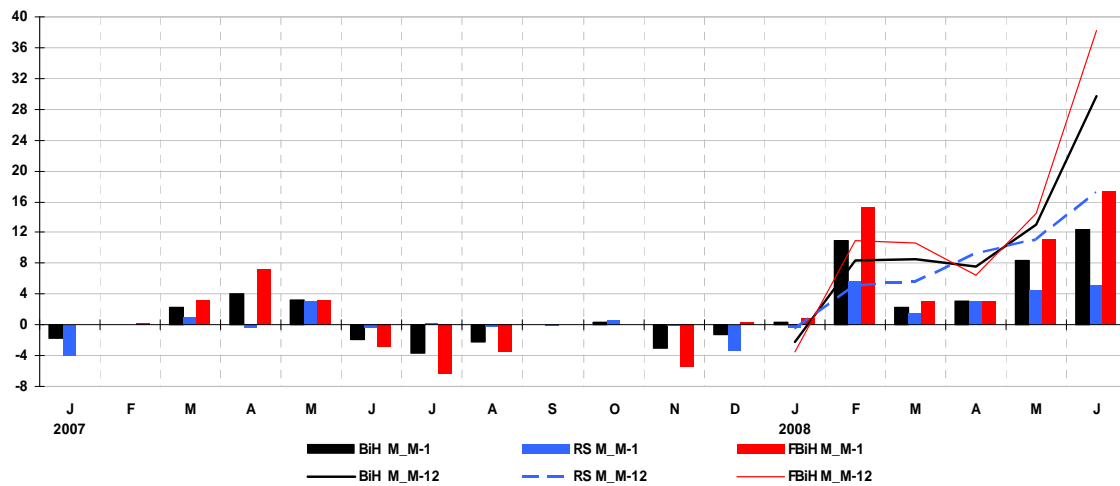
**Graph 41 – Producer Price, Subsection DH rates of change by Entities. Year 2007–2008 (base Dec. 2006 =100)**



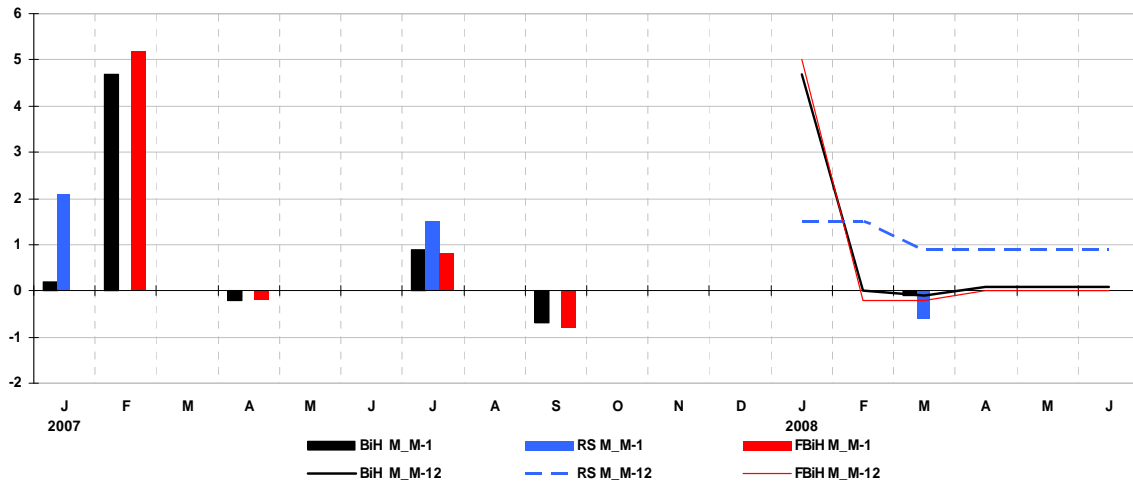
**Graph 42 – Producer Price, Subsection DI rates of change by Entities. Year 2007 – 2008  
(base Dec. 2006 =100)**



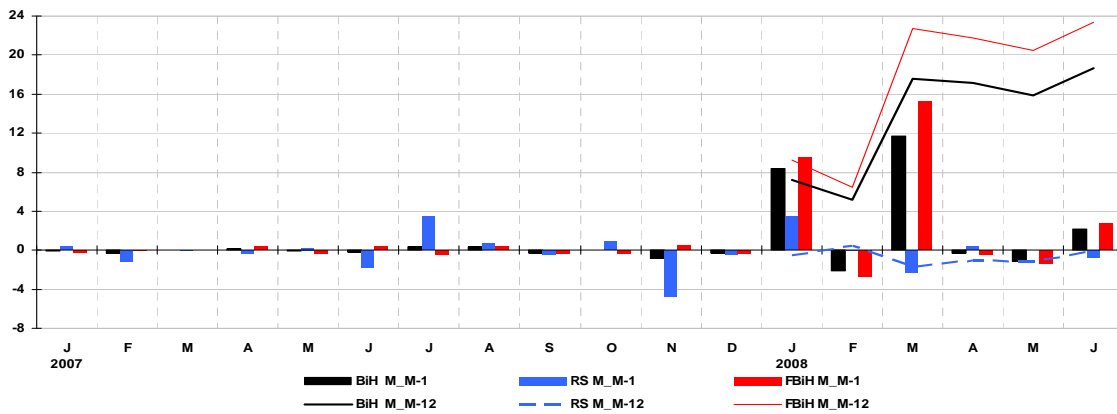
**Graph 43 – Producer Price, Subsection DJ rates of change by Entities. Year 2007 – 2008  
(base Dec. 2006 =100)**



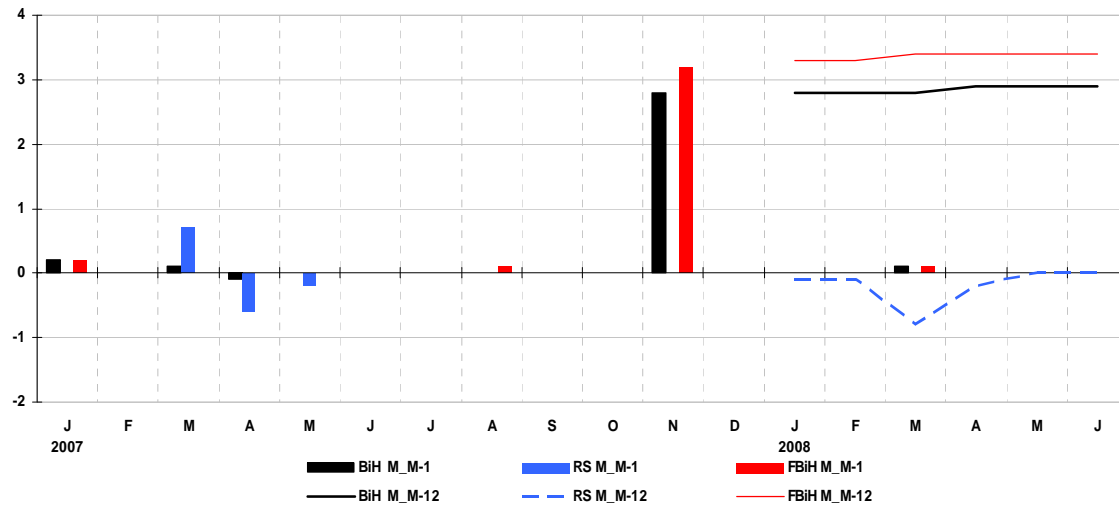
**Graph 44 – Producer Price, Subsection DK rates of change by Entities. Year 2007 – 2008  
(base Dec. 2006 =100)**



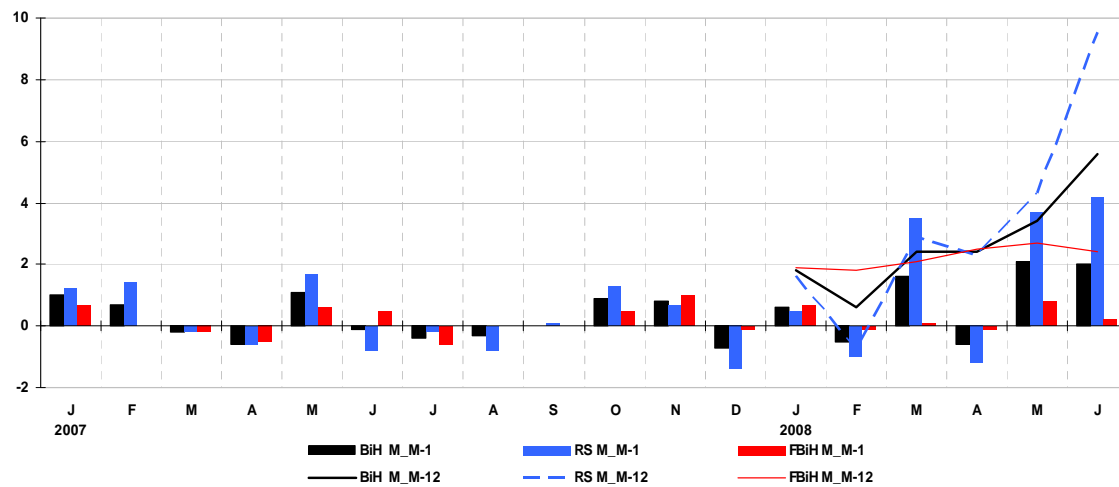
**Graph 45 – Producer Price, Subsection DL rates of change by Entities. Year 2007–2008  
(base Dec. 2006 =100)**



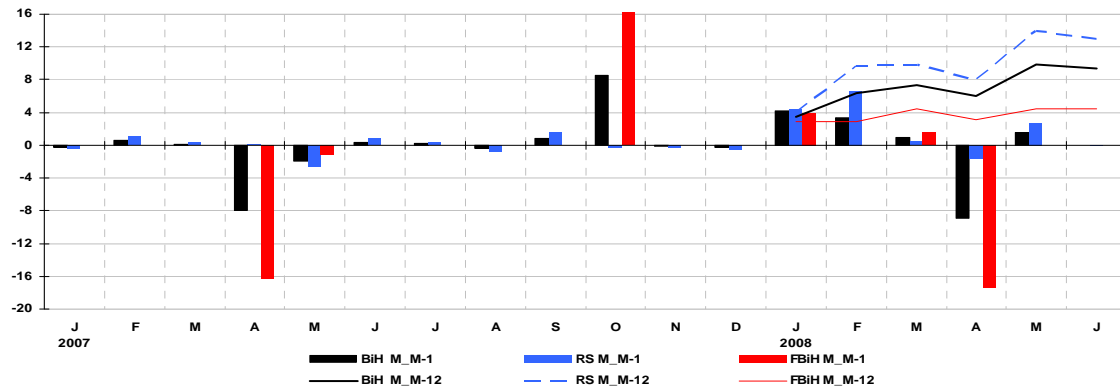
**Graph 46 – Producer Price, Subsection DM rates of change by Entities. Year 2007 – 2008 (base Dec. 2006 =100)**



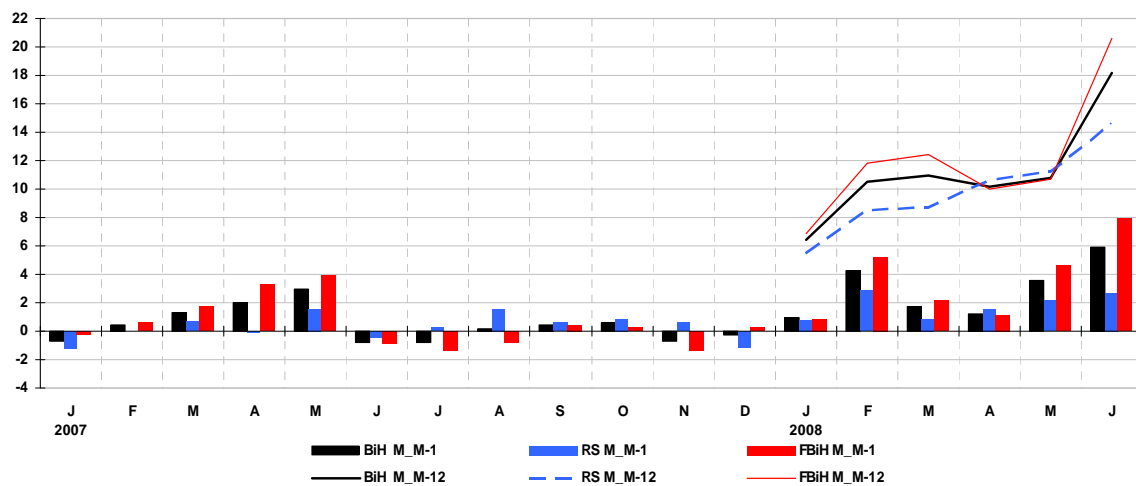
**Graph 47 – Producer Price, Subsection DN rates of change by Entities. Year 2007 – 2008 (base Dec. 2006 =100)**



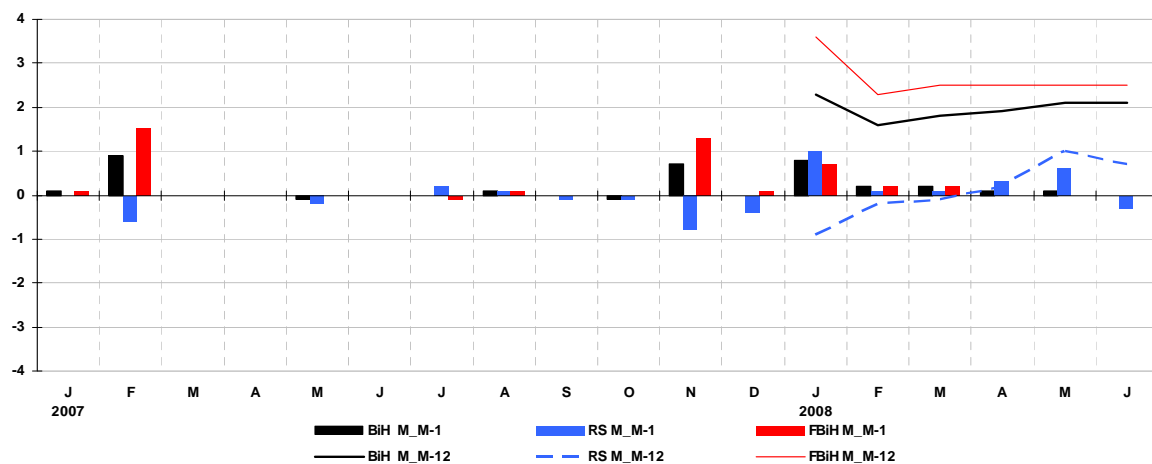
**Graph 48 – Producer Price, Subsection EA rates of change by Entities. Year 2007 – 2008 (base Dec. 2006 =100)**



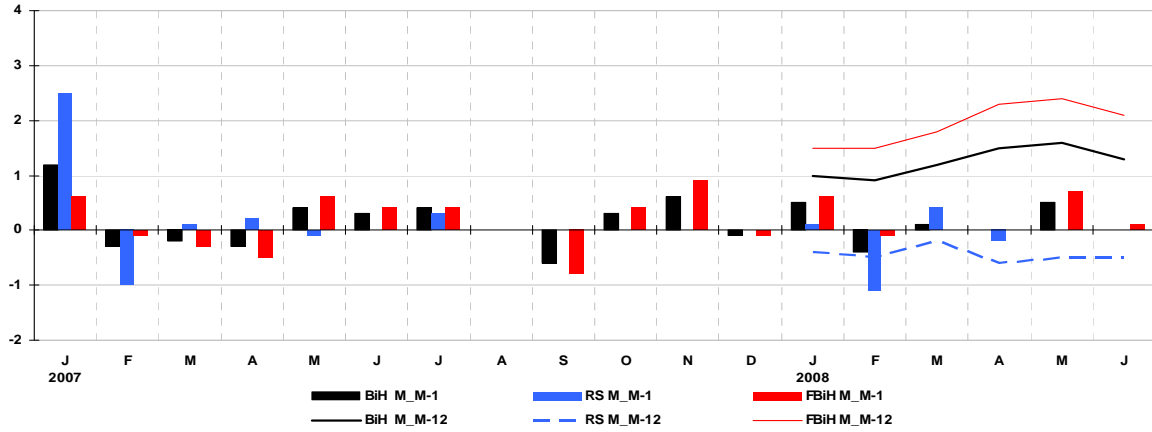
**Graph 49 - Producer Price, Intermediate goods industries rates of change. Year 2007 – 2008 (base Dec. 2006=100)**



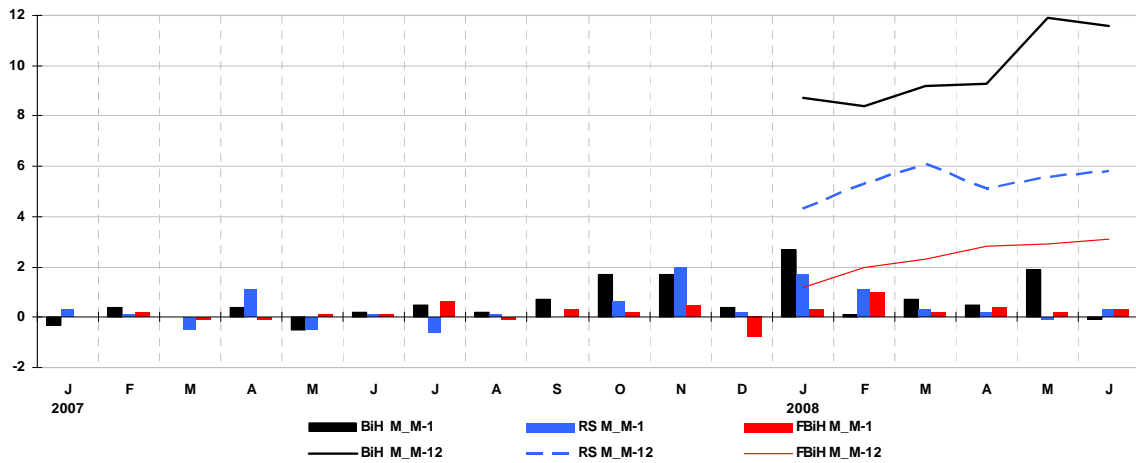
**Graph 50 - Producer Price, Capital goods industries rates of change. Year 2007 – 2008 (base Dec. 2006=100)**



**Graph 51 - Producer Price, Durable consumer goods rates of change. Year 2007 – 2008 (base Dec. 2006=100)**

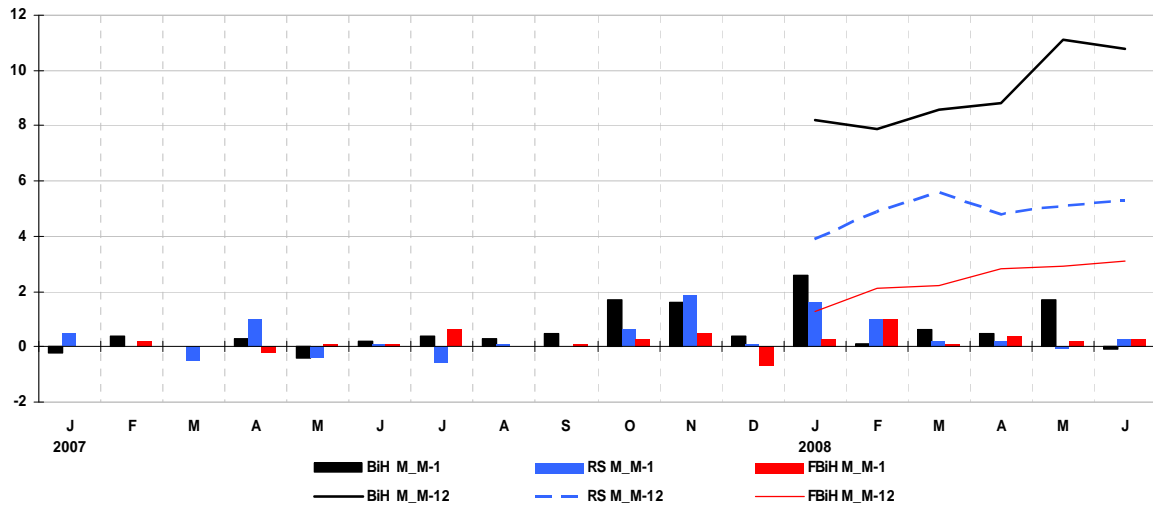


**Graph 52 - Producer Price, Non-durable consumer goods rates of change. Year 2007 – 2008 (base Dec. 2006=100)**

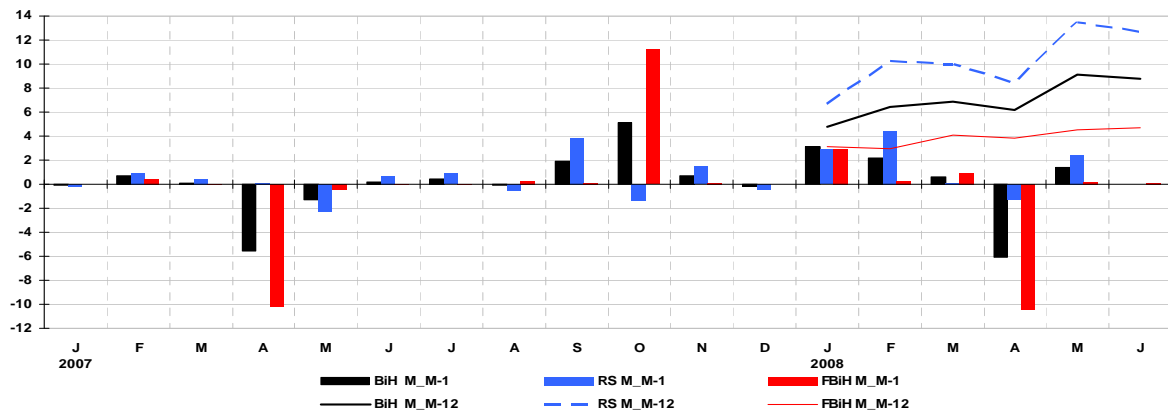




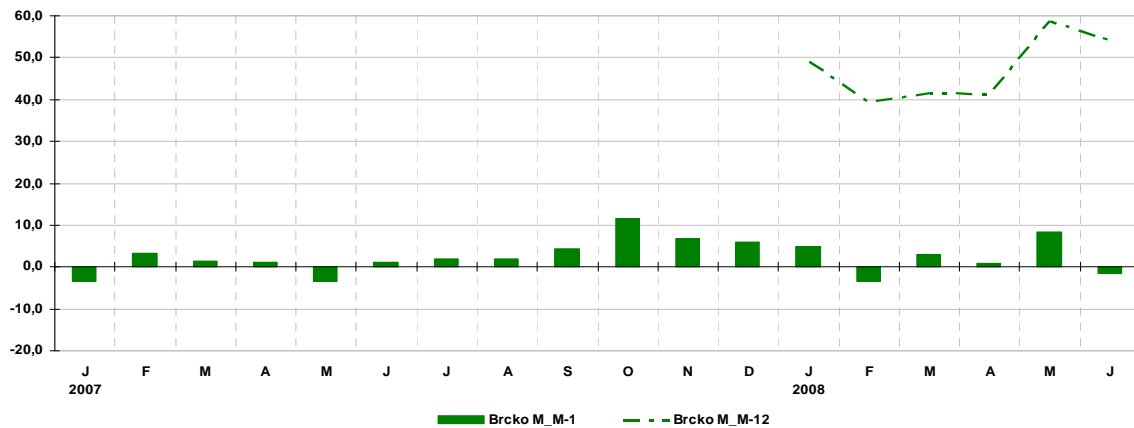
**Graph 53 - Producer Price, Consumer goods rates of change. Year 2007 – 2008 (base Dec. 2006=100)**



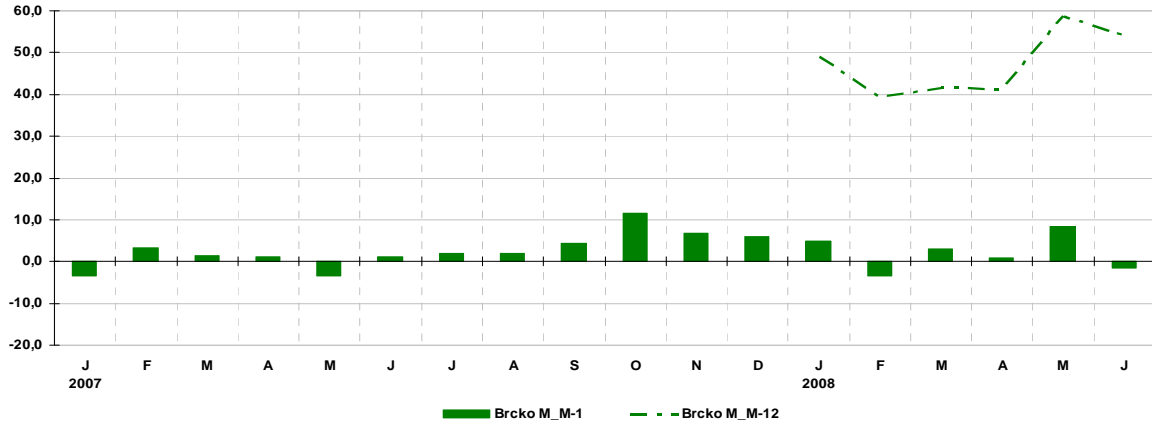
**Graph 54 - Producer Price, Energy rates of change. Year 2007 – 2008 (base Dec. 2006=100)**



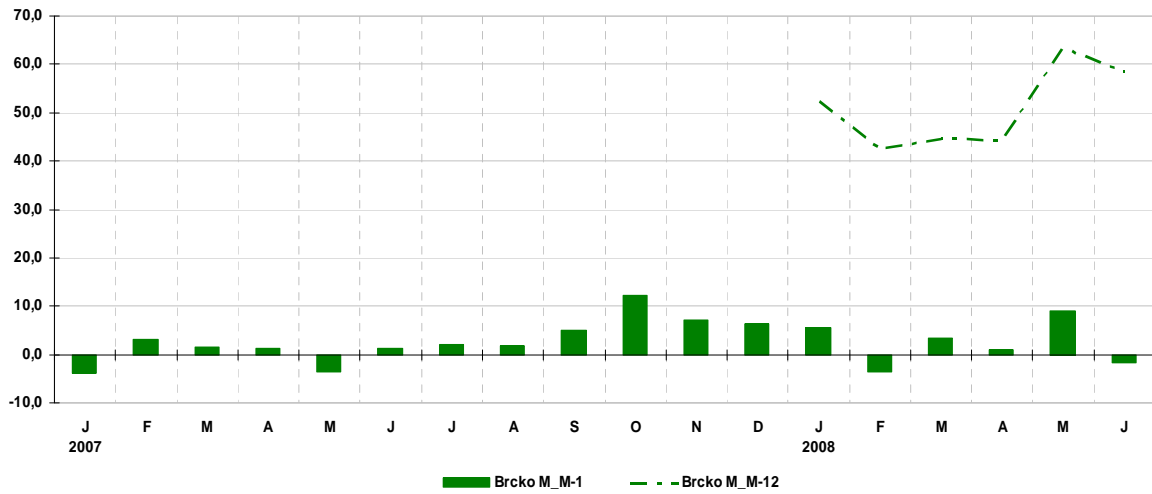
**Graph 55 – Brcko Producer Price, Overall rates of change. Year 2007 – 2008 (base Dec. 2006 =100)**



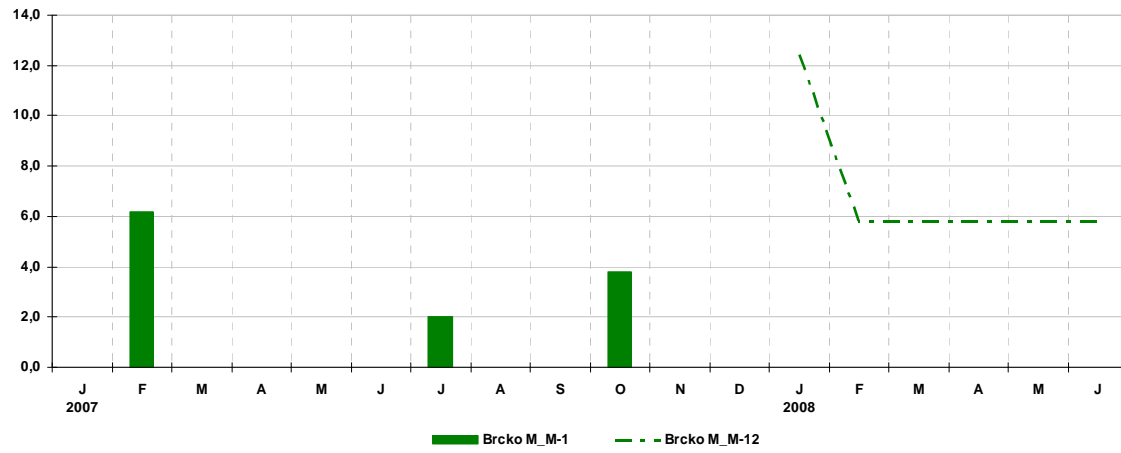
**Graph 56 – Brcko Producer Price, Section D rates of change. Year 2007 – 2008 (base Dec. 2006 =100)**



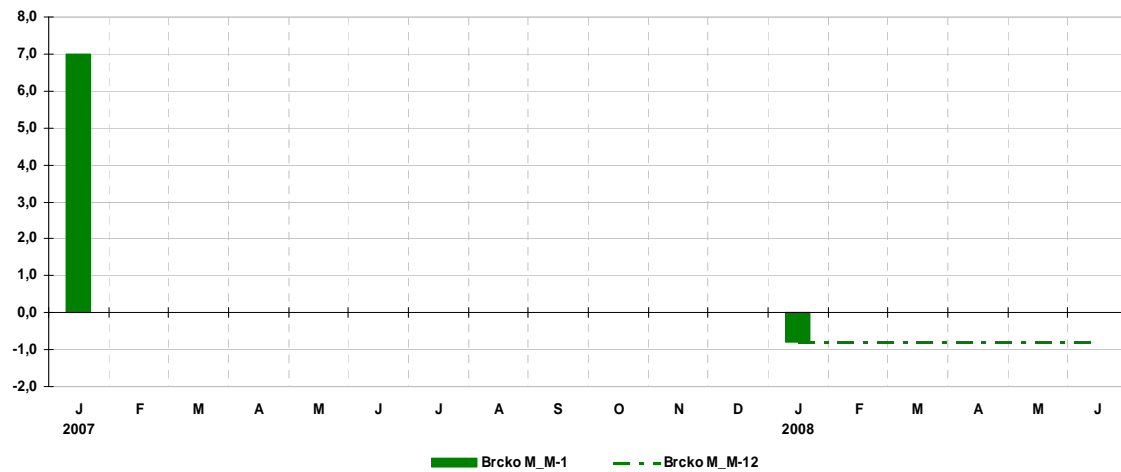
**Graph 57 – Brcko Producer Price, Subsection DA rates of change. Year 2007 – 2008 (base Dec. 2006 =100)**



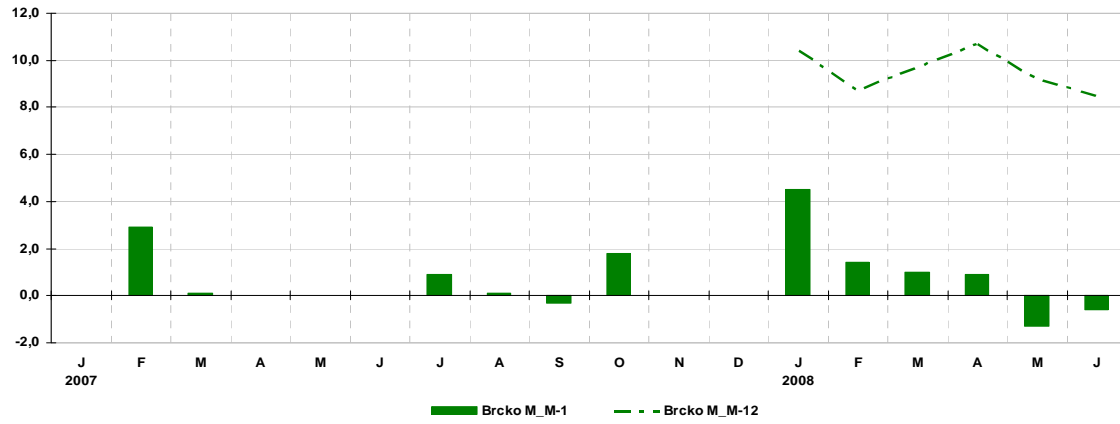
**Graph 58 – Brcko Producer Price, Subsection DG rates of change. Year 2007 – 2008 (base Dec. 2006 =100)**



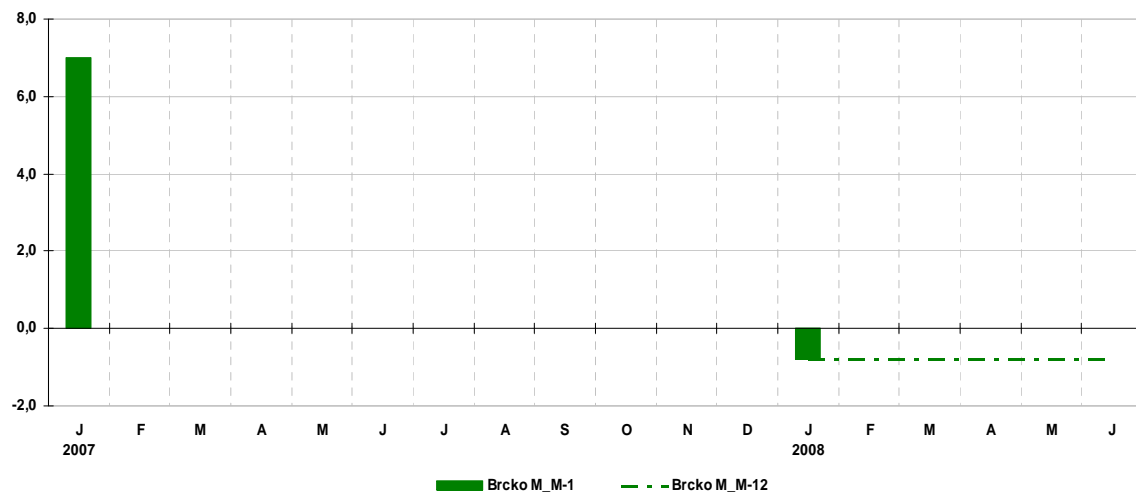
**Graph 59 – Brcko Producer Price, Subsection DN rates of change. Year 2007 – 2008 (base Dec. 2006 =100)**



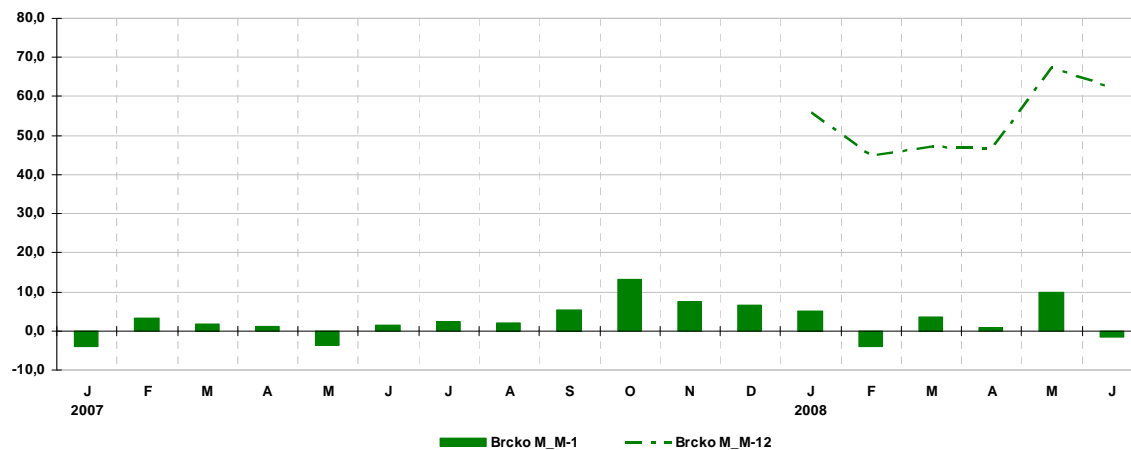
**Graph 60 – Brcko Producer Price, Intermediate goods industries rates of change. Year 2007 – 2008 (base Dec. 2006 =100)**



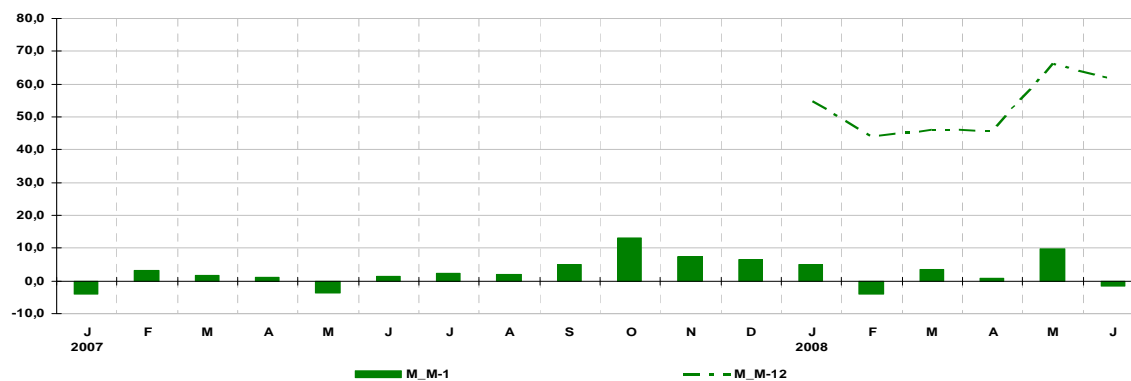
**Graph 61 – Brcko Producer Price, Durable consumer goods rates of change. Year 2007 – 2008 (base Dec. 2006 =100)**



**Graph 62 – Brcko Producer Price, Non-durable consumer goods rates of change. Year 2007–2008 (base Dec. 2006 =100)**



**Graph 63 – Brcko Producer Price, Consumer goods rates of change. Year 2007 – 2008 (base Dec. 2006 =100)**

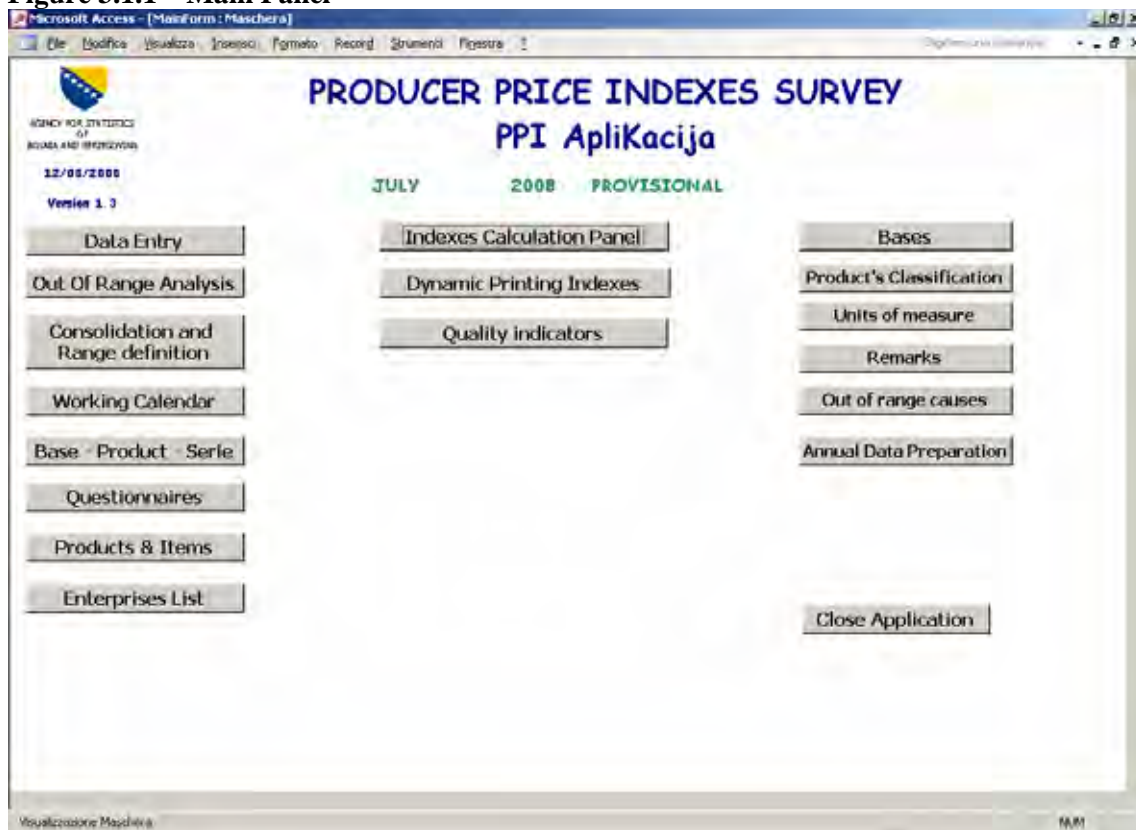


### **3. Software User's Guide**

#### *3.1 Main Panel*

The main appearance of the software release "PPI Aplikacija" (Figure 3.1.1) is a panel made up of three logical columns. In the middle one there are the links to the Calculation Panel, the Indexes dynamic report and the Quality indicators report. On the right the column links contains the action buttons. On the left column there are the links to the main facilities of the application, the reports and actions tables. All the forms (facilities) will be shortly described in this document. About the maintenance of the software application, descriptions tables have to be updated very rarely, because the information they contain, are set up at the beginning of the software use. The action tables need to be updated every year (in December), after the calculation of final indexes. These tables are: `BASE_PROD_SERIES`, `HIERARCHY`, `WEIGHT`. During the year, before starting the new series (items) data collection (for the new base), it is necessary to add new units (enterprises and new products) in the appropriate tables. The form (Data Entry) is used for updating the table `PRICES_COLLECTIONS`. The other tables concern the calculation procedure. To access each form the user has to push the linked button. Each form contains a button named 'Back' to come back at the 'Main Panel' form.

**Figure 3.1.1 – Main Panel**

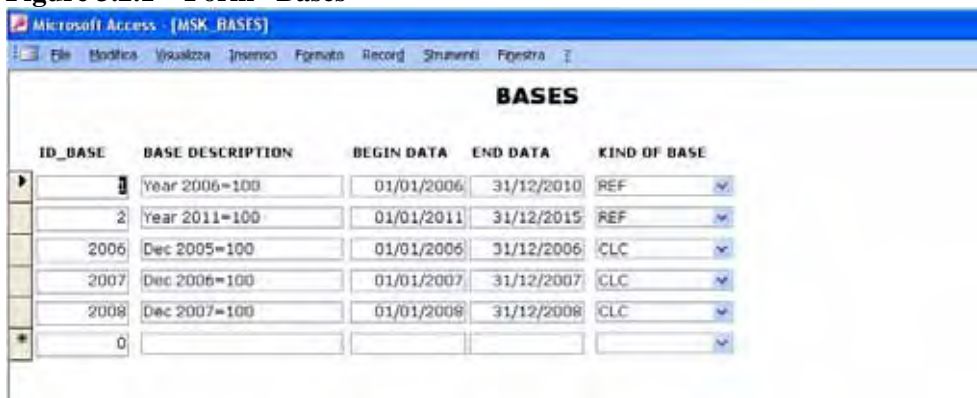


### 3.2 Description tables

The form “Bases” (Figure 3.2.1) allows the user to entry and modify elementary data in the bases table. The elementary data entered concern the calculation base index being the chained Indices firstly compiled in their calculation base and then in the reference one. In the table PRICES\_COLLECTIONS, the elementary prices are stored.

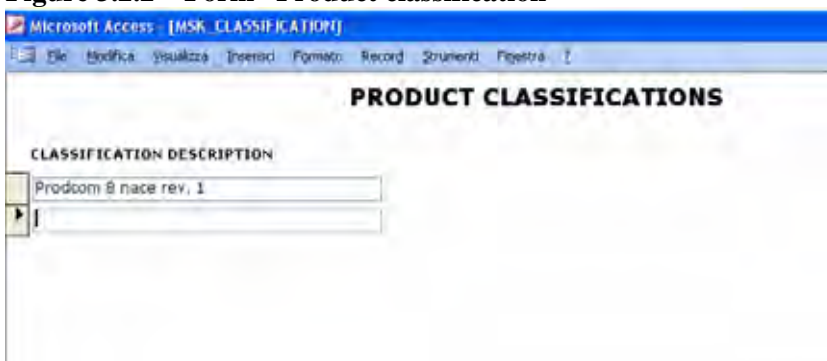
To add a new base the user has to input its data in the row marked by the asterisk. It’s worth noting that the indexes can be calculated on the reference base starting from the second year only.

**Figure 3.2.1 – Form “Bases”**



The form “Product classification” (Figure 3.2.2) allows to input and modify data in CLASSIFICATIONS tables. The classifications concern products. To add a new product classification the user has to insert its name in the row marked by the asterisk.

**Figure 3.2.2 – Form “Product classification”**



The form “Unit of measure” (Figure 3.2.3) allows the user to input and modify elementary data in the table UNITS\_OF\_MEASURE. To add a new unit of measure the user has to insert its name in the row marked by the asterisk.



**Figure 3.2.3 – Form “Unit of measure”**

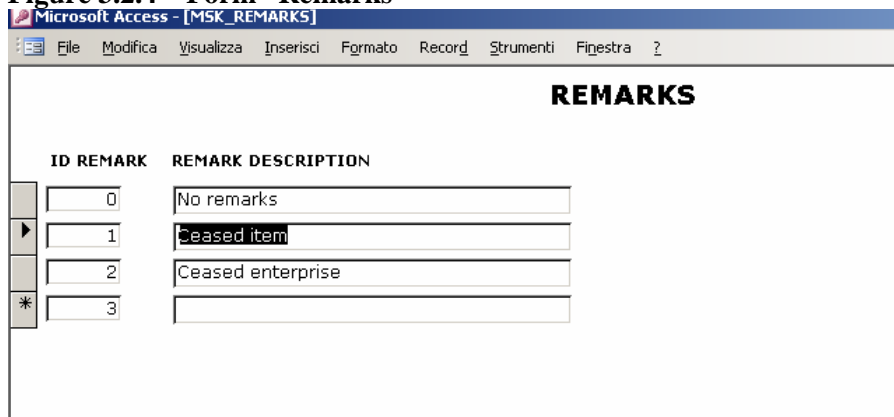


This form “Remarks” (Figure 3.2.4) allows to input and modify elementary data in the table REMARKS.

**WARNING:**

the id\_remark 0 (no remarks), 1 (ceased item) and 2 (ceased enterprise) must not be modified since their values are those used in the VBA identification codes for ceased units (items and enterprise).

**Figure 3.2.4 – Form “Remarks”**



ID_REMARK	REMARK_DESCRIPTION
0	No remarks
1	Ceased item
2	Ceased enterprise

The form “Out of range causes” (Figure 3.2.5) allows the user to input and modify elementary data in the table OUT\_OF\_RANGE\_CAUSES. The meaning of “KIND” field is to define if the

reasons or causes description refer to a price that is out of range (because greater than the maximum price set in PRICES\_COLLECTIONS table KIND=High or because smaller than the minimum price set Kind=Low). To add a new out of range cause the user has to select its type and enter its name in the row marked by the asterisk.

**Figure 3.2.5 – Form “Out of range causes”**



### 3.3 Action tables and facilities

These facilities are placed on the left frame of the main panel. Procedure steps:

1. select the reference (i.e. the month at whom data enter operation refer);
2. set up the “elaboration month” and define the range for the elaboration month;
3. make the data entry and checking work (Out of range Analysis);
4. calculate the indexes.

The form “Enterprise List” (Figure 3.3.1) allows the user to insert, modify, delete enterprises.

#### WARNING:


Deleting an enterprise means deleting all the information linked (in the other tables).

To add a new enterprise the user has to push the button named “Add new enterprise” in the bottom of the form, entering data required to press the button “Back” or push on the “Record selector” bar to save the data just entered.

**Figure 3.3.1 – Form “Enterprise List”**

CORPORATE NAME	REFERRING	PHONE_NUMBER	FAX_NUMBER	EMAIL	
ENTERPRISE 1					Detail / Modify / Delete
ENTERPRISE 4					Detail / Modify / Delete
ENTERPRISE 5					Detail / Modify / Delete
ENTERPRISE 6					Detail / Modify / Delete
ENTERPRISE 7					Detail / Modify / Delete
ENTERPRISE 8					Detail / Modify / Delete
ENTERPRISE 9					Detail / Modify / Delete
ENTERPRISE 11					Detail / Modify / Delete
ENTERPRISE 12					Detail / Modify / Delete
ENTERPRISE 13					Detail / Modify / Delete
ENTERPRISE 14					Detail / Modify / Delete
ENTERPRISE 15					Detail / Modify / Delete
ENTERPRISE 16					Detail / Modify / Delete
ENTERPRISE 18					Detail / Modify / Delete
ENTERPRISE 22					Detail / Modify / Delete
ENTERPRISE 24					Detail / Modify / Delete
ENTERPRISE 26					Detail / Modify / Delete
ENTERPRISE 27					Detail / Modify / Delete
ENTERPRISE 28					Detail / Modify / Delete
ENTERPRISE 29					Detail / Modify / Delete

<< Back      Add new enterprise

The facility “Products and items” (Figure 3.3.2) allows the user to insert, modify and delete products and their corresponding items. The items can be entered directly by the data entry form, after inserting the questionnaire, through the button “Add new series”. To add a new product the user has to push the icon  at the bottom of the form, then insert the product code and its description; to save the data just inserted the user has to push the button “Back” or push on the “record selector” bar.



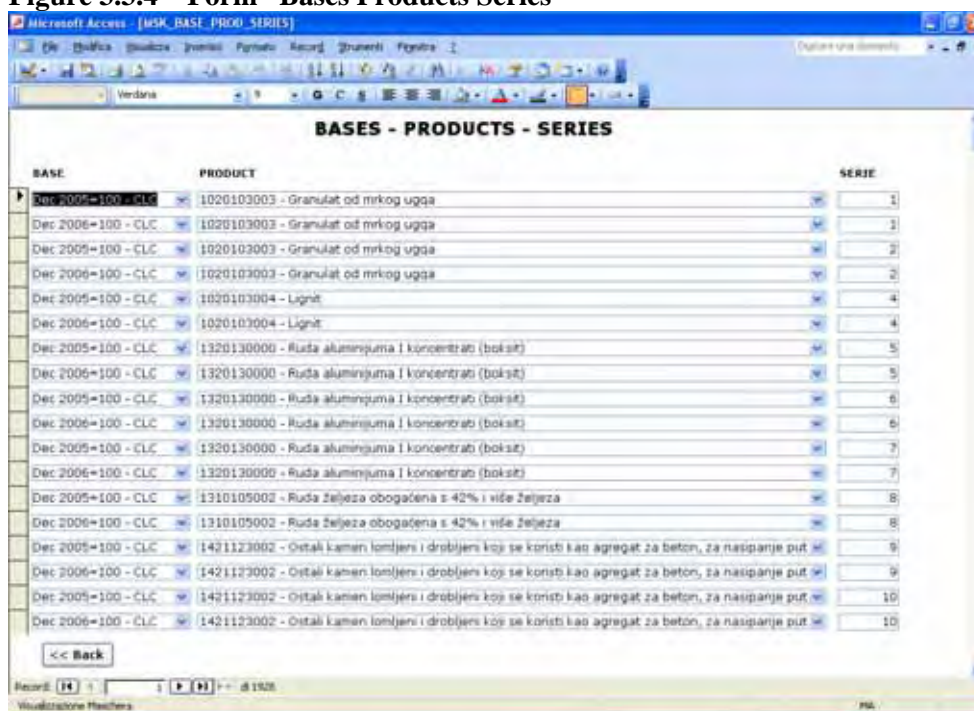
**Figure 3.3.3 – Form “Questionnaires”**

The screenshot shows a Microsoft Access form window titled "QUESTIONNAIRES". The form is displayed in a grid layout with three columns: "ID QUESTIONNAIRE", "ENTERPRISES", and "PRODUCT CODE". The first row contains the values "1", "ENTERPRISE 1", and "1111111111 - PRODUCT 1". The second row is empty. At the bottom left of the form, there is a button labeled "<< Back". The window title bar indicates the file name is "MSK\_QUESTIONNAIRES".

ID QUESTIONNAIRE	ENTERPRISES	PRODUCT CODE
1	ENTERPRISE 1	1111111111 - PRODUCT 1

The form “Bases Products Series” (Figure 3.3.4) allows the user to read the products and the series list referring to each base only. However, it does not allow the user to enter any data, as only the IT expert assistance allows to enter some additional data. The data of this table (BASES\_PRODUCTS\_SERIES) must be inserted at the beginning of each year.

Figure 3.3.4 – Form “Bases Products Series”

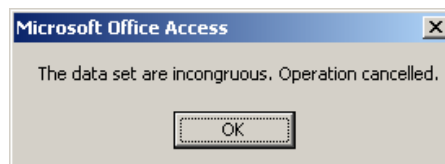


The working calendar form (Figure 3.3.5) allows the user to define, for each period (starting from the field Begin\_Data up to the field End\_Data) which months are “qualified” for data entry operations (data-entry, quality change and the adding of new series). The first day of the month m the data collection operation starts with regard to the previous month m-1. Usually, up to the first half of the month m, there are two “qualified” months for data entering: the former concerns the calculation of final indices of the month m-1 while the latter month m, allows to enter prices concerning the provisional calculation. The form contains some checks in order not to input incongruent data.

**Figure 3.3.5 – Form “Working day calendar”**

BEGIN DATA	END DATA	BEGIN MONTH/YEAR	END MONTH/YEAR
01/01/2006	15/01/2006	11 2005	12 2005
16/01/2006	31/01/2006	12 2005	12 2005
01/02/2006	15/02/2006	12 2005	1 2006
16/02/2006	28/02/2006	1 2006	1 2006
01/03/2006	15/03/2006	1 2006	2 2006
		0 0	0 0

The form “Consolidation and range definition” (Figure 3.3.6) must be used immediately after the index calculation. It allows the user “to consolidate” the month for which indices has been just calculated. Once provisional indices have been consolidated the calculation of final indices is allowed. Immediately after the consolidation, the user must execute the “definition range” operation that sets up the minimum and maximum price updating the data expectation range. In the above form there are some checks for verifying that the data entered are congruent. If the user tries to input data which are not congruent, when he is going to save them, the message below will appear.



The user has to press ‘Ok’ button and insert congruent data.

**Figure 3.3.6 – Form “Consolidation and range definition”**

Microsoft Access - [msk\_CONSOLIDATION : Maschera]

File Modifica Visualizza Inserisci Formato Record Strumenti Finestra ? Digitare una domanda.

### Consolidation and range definition

**Last index calculated**

CONSOLIDATION\_YEAR: 2007

CONSOLIDATION\_MONTH: 12

KIND\_OF\_CALCULUS: FINAL

**Next index to elaborate**

ELABORATION\_YEAR: 2008

ELABORATION\_MONTH: 1

KIND\_OF\_CALCULUS: PROVISIONAL

<< Back Consolidation Define the Range for elaboration month

### 3.4 Data entry

The facility of “Data Entry” (Figure 3.4.1) allows the user to enter into the questionnaires in order to:

1. make a quality change;
2. set an item ceasing;
3. correct typing error;
4. add new items;
5. reset the last operation.

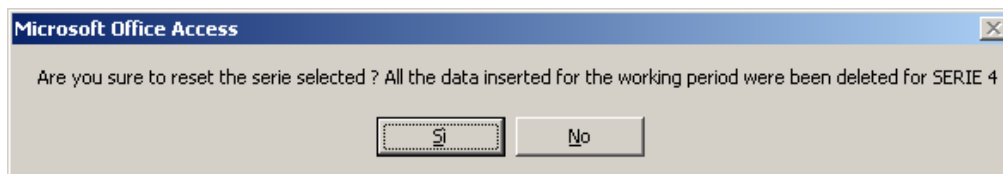
There are two entering ways: the first is direct, by selecting the id\_questionnaire (that should be printed on paper form) in the second combo box and pushing button named “Data Entry”; the second through the complete list of the enterprise questionnaires by selecting the enterprise in the first combo box and pushing the button named “Data Entry”. In this case, a single form, will be opened and the user can move from a questionnaire to another using the “record selector” in the bottom of the form.



**Figure 3.4.1 – Form “Data Entry – Access at the questionnaire”**

The screenshot shows a Microsoft Access window with the title bar 'Microsoft Access - [MSK\_DATA\_ENTRY]'. The menu bar includes 'File', 'Modifica', 'Visualizza', 'Inserisci', 'Formato', 'Record', 'Strumenti', and 'Finestra'. The toolbar contains various icons for file operations and data manipulation. The form content is centered and features the text 'DATA ENTRY' in bold black font, followed by 'MAY 2006 PROVISIONAL' in green font. Below a horizontal line, there are two dropdown menus: 'ENTERPRISE' and 'QUESTIONNAIRE'. A 'Data Entry' button is positioned below the second dropdown menu.

Starting from the form below (figure 3.4.2), for each questionnaire, the user can enter into each item. The button “Add / Upd Data” allows, for the corresponding item, to enter into the form in which he can enter prices or the “no sale flag”; the button “C. of Q.” allows to enter into the Change of Quality forms. Vive versa, the “Reset” button allows to reset the data for the working month. When the user pushes this button the following message will be displayed:



The user can confirm the reset operation pressing the button “Yes”.

At the bottom of the form there is also the button “Add new series” that allows the user to add a new series (item) for the product displayed, starting from the elaboration month set.

About the “C. of Q.” button: months are qualified and the quality change is allowed only on the first month, the elaboration one. To make a quality change on the second month the user has to wait that the second month becomes the first one. This limitation (in making quality change) avoids errors in case there are two qualified months and the user is making a quality change in the first month after entering prices on the second one about the old item. This limitation avoids also a situation with two qualified months, in which two different items are present.

Figure 3.4.2 – Form “Data Entry – Questionnaire level”

**Data Entry - Questionnaire level - Id\_Questionnaire = 2**

MAY      2006      PROVISIONAL

ENTERPRISE 1

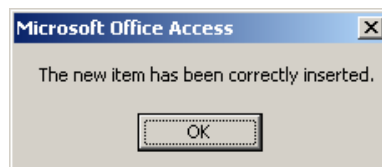
222222      PRODUCT 2

**ITEM LIST**

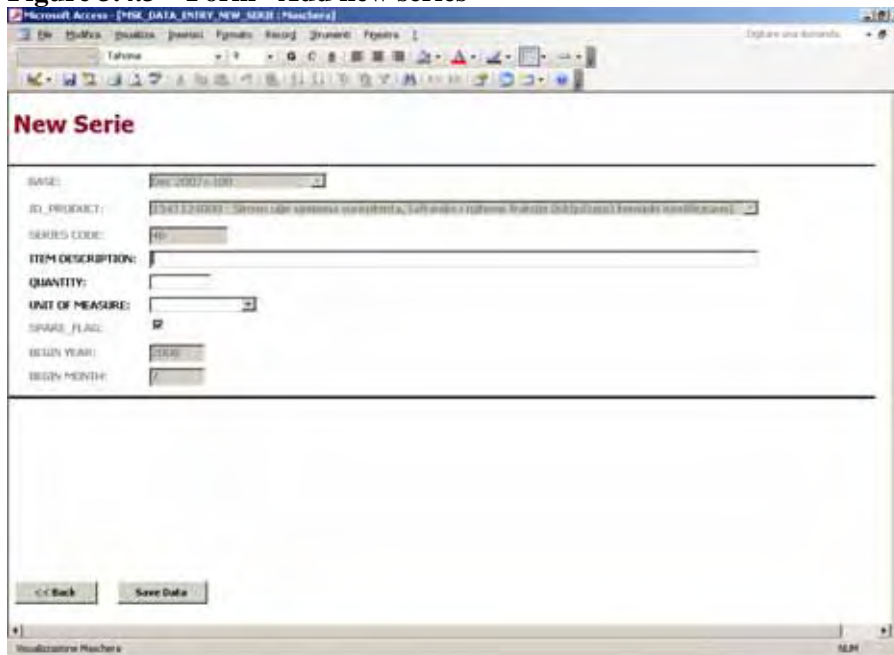
SERIES CODE	ITEM DESCRIPTION	QUANTITY	U. of M.	YEAR	MONTH	PRC	NO SALE
2	ITEM 2 OF PRODUCT 2	1	l'	2006	May	0	
4	ITEM 2 OF PRODUCT 2	1	m3	2006	May	0	
5	ITEM 5 OF PRODUCT 2	1	piece	2006	May	0	
6	ITEM 6 OF PRODUCT 2	1	l'	2006	May	0	

Record: 14 | Visualizzazione Maschera

The form “Add new series” /figure 3.4.3.) allows the user to add a new item (series). The micro-index base is automatically set up. The series code is automatically updated. The new items are flagged as spare (i.e. they are not involved in the monthly index calculation procedure). To complete the entering of the new series, the user has to complete the form and press the button “Save Data”. If the operation has been correctly executed, the following message will be displayed:



**Figure 3.4.3 – Form “Add new series”**



The form “Data entry – Prices Input” (figure 3.4.4) allows the user to input the “no sale flag” and the out of range (O.O.R.) causes. At the bottom of the form the data about the last thirteen months are displayed. At the top, there are the series code selected in the previous form and the corresponding item description. There are up to two boxes (one per month) for entering the data. The combo box about ‘O.O.R. cause’ is loaded in a dynamic way depending on the reason of out of range causes. If the price entered is out of range, the menu named “O.O.R. cause” will be enabled and the user has to select the out of range cause. If the user doesn’t specify the cause and try to save the following message will appear:



To delete a wrong price entered the user has to select the “no sale” flag twice, so that the “non sale” flag is not selected anymore and the price is equal to zero, then press the button “Save Data” to save the updating. To come back to the previous form the user has to click on the button “Back”.

**Figure 3.4.4 – Form “Data Entry – Prices Input”**

**Data Entry - Prices Input**

SERIES CODE: 1      ITEM: ITEM 1 OF PRODUCT 1

**FEBRUARY 2007**

No Sale     Price (€) [0]    O.O.R. Cause [ ]

**JANUARY 2007**

No Sale     Price (€) [0]    O.O.R. Cause [ ]

YEAR	MONTH	NO SALE	PRICE	PRICE BASE	MICRO INDEX	OUTLIER	OP. VALIDATION	OUT OF RANGE CAUSE	QUALITY CHANGE				RANGE		REMARKS
									ITEM	U.M.	Q	CONTR	MIN	MAX	
2007	Feb		0,00	0,00	0,00			no one					0,00	INF	No remarks
2007	Jan		0,00	0,00	0,00			no one					0,00	INF	No remarks
2006	Dec		0,00	70,00	0,00			no one					0,00	INF	No remarks
2006	Nov		0,00	70,00	0,00			no one					0,00	INF	No remarks
2006	Oct		0,00	70,00	0,00			no one					0,00	INF	No remarks
2006	Sep		0,00	70,00	0,00			no one					0,00	INF	No remarks
2006	Aug		0,00	70,00	0,00			no one					0,00	INF	No remarks
2006	Jul		0,00	70,00	0,00			no one					0,00	INF	No remarks
2006	Jun		0,00	70,00	0,00			no one					0,00	INF	No remarks
2006	May		0,00	70,00	0,00			no one					0,00	INF	No remarks

Records: 14

The ‘change of quality’ form (figure 3.4.5) is made up of two sub-forms: the former requires the user to select the kind of operation to do:

1. to correct misspelling (type error) in the description of the item;
2. to make a quality change;
3. to remark a ceased item.

**Figure 3.4.5 – Form “Data Entry – Change of Quality 1/2”**

**Data Entry - Quality Change 1/2**

**JANUARY 2007 FINAL**

SERIES CODE: 1

ITEM: ITEM 1 OF PRODUCT 1

QUANTITY: 1 U.M. t

Correction misspellings in the description of the item  
Type the correct item description:

Changes in product item

Item change  
Specify the new item:

Change in unit measuring  
Specify the new unit of measure:

Change in quantity per unit  
Specify the new quantity per unit:

Changes in contextual classes

Item ceased without replacement

<< Back   Confirm and go on >>

Record: 1   Visualizzazione Maschera

At the top of the second form (figure 3.4.6) the following items are shown: the reason of quality change selected in the previous form and the new values for the same series code like the new item description, the quantity and the units of measure. To save the data and to complete the quality change operations, the price of the new item for the month of replacement and the price of the new item for the month before the replacement are required. If the price of the previous month is not available for the new item the user has to tick out the flag “price for month before not available”.

**Figure 3.4.6 – Form “Data Entry – Change of Quality 2/2”**

**Data Entry - Quality change 2/2**

Quality change for: Item - Unit of measure - Contractual clauses

SERIES CODE: 1

ITEM: NEW ITEM ITEM DESCRIPTION

QUANTITY: 1 U.M. kg

Month of replacement: December

Price Euro: 5

Month before replacement: November

Price for month before replacement: 5

Price for month before replacement not available:

<< Back Save Data

Record: 14

### 3.5 The Indexes Calculation Panel

This form (figure 3.5.1) allows the user to calculate indexes both in calculation and reference base. This form is made up of two sections marked by a bold rectangle: the first section allows the monthly calculation and the next one concerns a utility to help the user.

**Figure 3.5.1 – Index Calculation Panel**

**Indexes Calculation Panel**

CALCULUS BASE: Dec 2004=100 REFERENCE BASE: year 2004=100

MONTH: 9 YEAR: 2005 TYPE OF CALCULATION: FINAL

1: Transferring from "Price Collections" to "Price Estimate" table

2: Price Estimation and Micro Indexes Calculation

3: Product Indexes Calculation

4: Aggregate Indexes Calculation

5: Indexes Calculation in Reference Base

12: Transferring for the year base the decision of the previous year of the new series only, that only for the ordinary Indexes Calculation

Export Monthly Indexes for Agency

LAST INDEX CONSOLIDATE PROVISIONAL - 9 / 2005

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### 3.6 Software for BHAS

The Software developed for the BHAS, allows the experts to calculate the indexes at 'state level' as weighted averages on the Entities SIs indices.

The main panel contains the link to the form "Indexes Calculation Panel" and the link for printing,

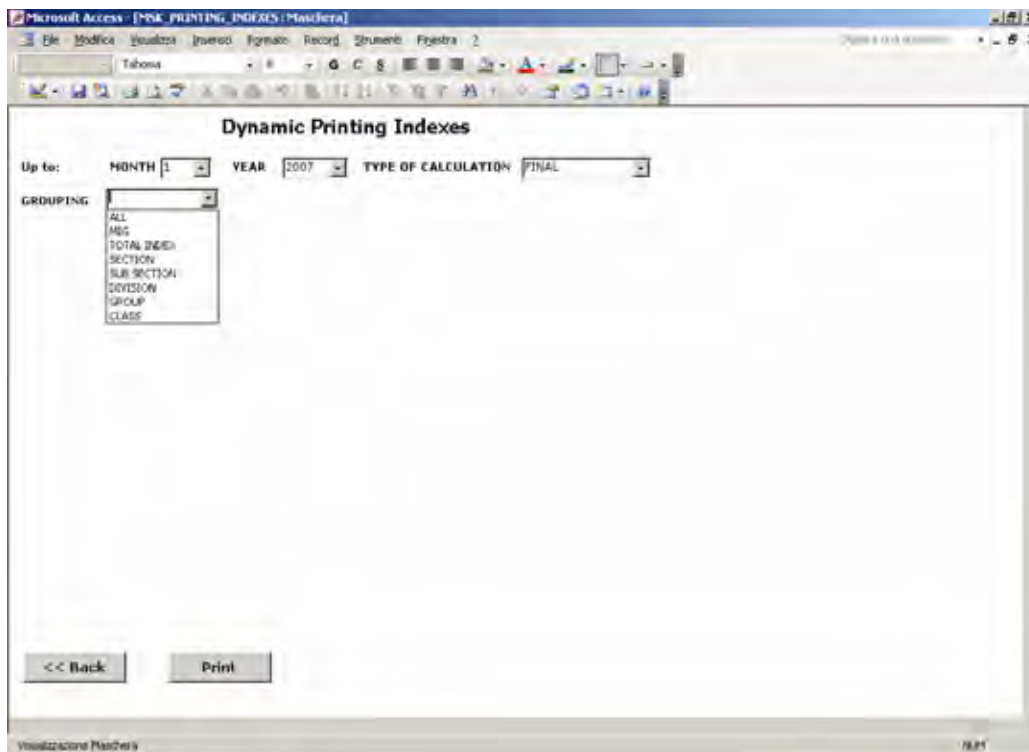
In the indexes Calculation Panel (figure 3.6.1) year, month and type of calculation (final or provisional) can be selected. The Entities SIs files have to be firstly imported and saved. Afterwards they are stored in the table "AGGREGATED\_INDEXES\_REF" by using the button "Import file...". In order to calculate the indices, the user has to push the button "Execute calculation".

**Figure 3.6.1 – Index Calculation Panel**

WEIGHT STRUCTURE 2007		
BRCKO	142.036.505,00	2,90%
FIS	2.965.703.440,52	60,65%
RSIS	1.782.507.880,27	36,45%
TOTAL	4.890.327.833,86	100,00%

Once the indices are calculated tables can be printed according to the form below (figure 3.6.2). This form allows the user to select the period and the grouping of indexes to print.

**Figure 3.6.2 – Dynamic Printing Indexes**



From a technical point of view, in the software there are two kind of operations to execute: monthly operations and annual ones.

Each month the Entities SIs export their indexes in a text file and send it to the BHAS. The BHAS:

1. saves these files in path C:\;
2. imports them in the database;
3. calculates indexes at state level.

After updating these tables, a set of operations to provide the hierarchy and weight structure has to be carried out. Each Entity SI, transmits to the BHAS at the beginning of the year two excel files containing:

1. the result of the query “EXPORT\_ANNUAL\_WEIGHT\_FOR\_AGENCY”; (BHAS has to copy and paste these data set in the tables PRODUCT\_WEIGHT\_RSIS, PRODUCT\_WEIGHT\_FIS and PRODUCT\_WEIGHT\_BRCKO.



2. the Hierarchy table filtered with the value of the new year; (BHAS has to copy and paste these data in tables HIERARCHY\_RSIS, HIERARCHY\_FIS and HIERARCHY\_BRCKO).

Annually all the query about the weightings structure are also automatically updated. The last operation to complete the annual update of data is to copy and paste the result of the query “WEIGHTINGS\_STRUCTURE” in the table “WEIGHTINGS”.

The process to define the weightings structure and the monthly calculation of PPI at state level is shown in figures 3.6.3 and 3.6.4).

Figure 3.6.3 – Pattern to define weightings structure

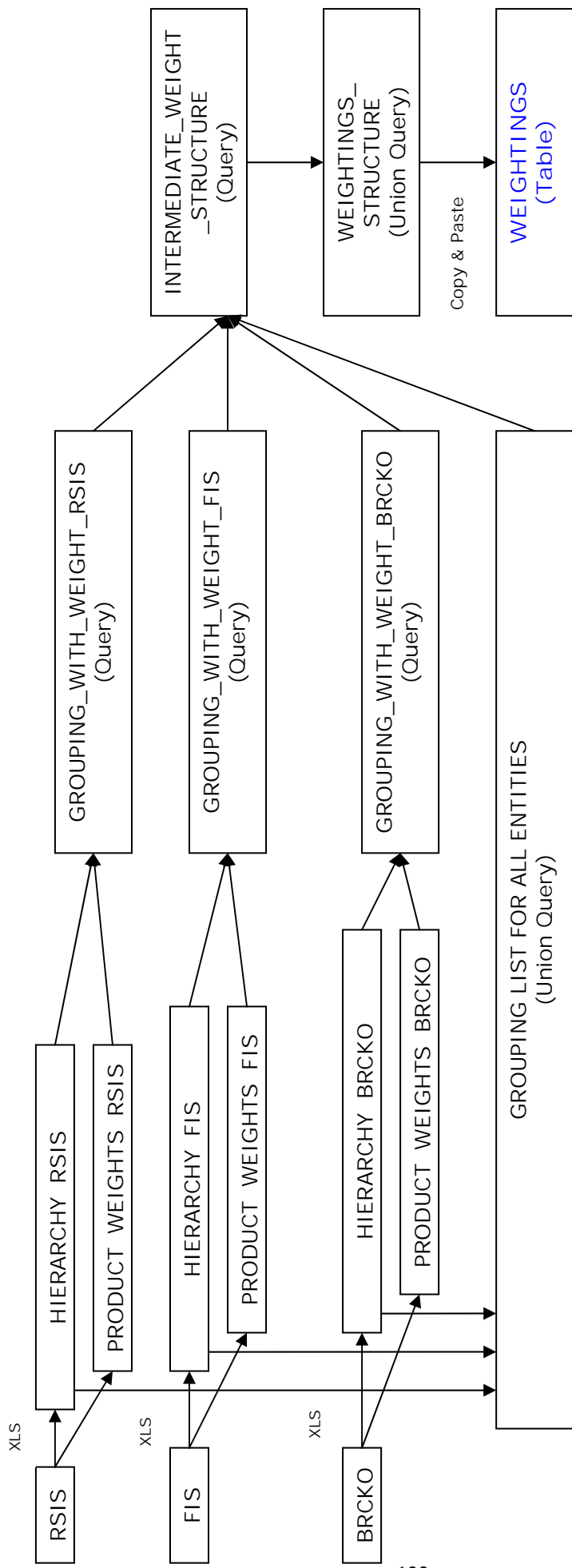
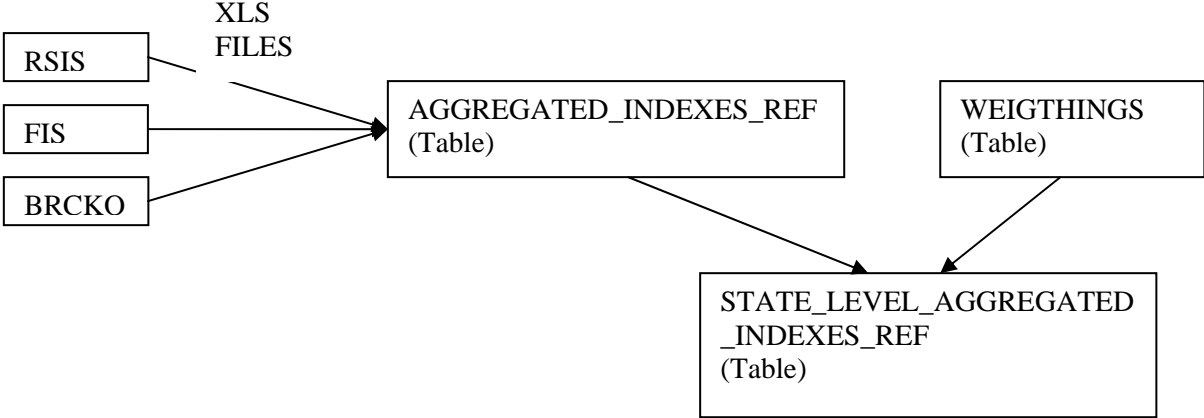


Figure 3.6.4 – Pattern to calculate PPI at State level



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**Table 1 – BiH Indexes 2007-2008 by NACE aggregations (base Dec 2006=100)**

NACE	Jan 2007	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Mean 2007	Jan 2008	Feb	Mar	Apr	May	Jun
Total	99,7	100,2	100,7	99,7	100,2	100,1	100,1	100,1	101,1	103,3	103,7	103,7	101,1	105,8	108,1	109,1	107,7	110,0	112,3
C	100,2	101,2	101,1	101,1	101,1	100,8	101,4	101,9	105,5	103,7	105,9	106,0	102,5	107,5	106,8	106,3	106,4	106,5	106,7
CA	100,2	101,0	101,1	101,1	101,0	100,9	101,5	102,2	106,6	104,5	107,2	107,2	102,9	108,5	107,8	107,1	107,0	107,0	107,0
CB	100,1	101,9	101,8	101,6	101,6	100,4	100,9	100,9	100,7	100,8	100,7	101,0	101,0	104,4	103,9	104,4	105,3	105,2	106,5
D	99,6	100,0	100,7	101,8	103,2	103,0	102,7	102,8	103,4	104,4	104,8	104,8	102,6	106,3	108,7	110,0	110,9	113,8	117,1
DA	100,0	100,8	100,9	101,4	101,0	101,3	101,8	102,9	104,2	106,7	108,9	109,7	103,3	113,0	114,0	114,9	115,5	117,7	117,7
DB	100,5	100,3	99,5	100,0	98,1	98,7	97,9	97,1	96,4	97,9	98,4	98,4	98,6	96,3	94,9	94,3	95,7	95,5	95,5
DC	99,3	99,8	100,0	99,0	99,1	99,1	99,4	99,5	99,4	100,0	100,3	99,7	99,6	100,0	101,3	101,4	100,7	100,7	100,9
DD	100,1	100,1	100,8	101,1	100,9	101,0	101,7	104,1	104,1	103,9	104,5	104,5	102,2	105,4	106,0	106,5	107,0	106,8	106,4
DE	100,3	100,2	100,6	100,4	100,9	100,7	100,7	100,8	101,4	102,3	101,4	100,9	100,9	100,8	101,9	101,3	101,5	101,2	101,4
DF	100,5	102,7	101,6	97,3	99,3	101,5	100,7	101,9	102,6	106,2	106,9	107,4	102,4	108,5	105,0	108,8	108,7	117,8	122,1
DG	99,8	99,4	101,6	101,4	101,1	101,3	101,7	101,2	101,3	99,2	99,4	99,5	100,6	99,6	99,4	99,1	99,2	99,3	99,2
DH	98,2	97,8	97,7	97,4	100,2	100,7	100,4	100,5	101,3	100,4	101,7	101,9	99,9	101,9	101,1	101,1	101,6	101,6	101,6
DI	99,5	99,4	99,8	101,9	109,8	110,4	113,2	113,3	113,4	113,7	113,9	114,1	108,5	114,5	114,7	115,2	115,6	117,6	121,3
DJ	98,3	98,4	100,6	104,6	108,0	105,9	102,1	99,9	99,9	100,2	97,1	95,8	100,9	96,1	106,7	109,2	112,6	122,1	137,3
DK	100,2	104,9	104,9	104,7	104,7	104,7	105,6	105,6	104,9	104,9	104,9	104,9	104,6	104,9	104,9	104,8	104,8	104,8	104,8
DL	99,9	99,6	99,6	99,7	99,6	99,4	99,8	100,2	99,9	99,9	99,1	98,8	99,6	107,1	104,8	117,1	116,8	115,4	117,9
DM	100,2	100,2	100,3	100,2	100,2	100,2	100,2	100,2	100,2	100,2	103,0	103,0	100,7	103,0	103,0	103,1	103,1	103,1	103,1
DN	101,0	101,7	101,5	100,9	102,0	101,9	101,5	101,2	101,2	102,1	102,9	102,2	101,7	102,8	102,3	103,9	103,3	105,5	107,6
E	99,8	100,4	100,5	92,6	90,8	91,2	91,4	91,0	91,7	99,5	99,4	99,1	95,6	103,3	106,8	107,8	98,2	99,8	99,8
EA	99,8	100,4	100,5	92,6	90,8	91,2	91,4	91,0	91,7	99,5	99,4	99,1	95,6	103,3	106,8	107,8	98,2	99,8	99,8

**Table 2 – FBiH Indexes 2007-2008 by NACE aggregations (base Dec 2006=100)**

NACE	Jan 2007	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Mean 2007	Jan 2008	Feb	Mar	Apr	May	Jun
Total	99,9	100,4	100,9	99,1	100,3	100,0	99,7	99,4	99,7	102,8	102,5	102,4	100,6	103,7	106,0	107,1	104,6	106,5	109,8
C	100,0	101,2	101,1	101,1	101,1	101,0	100,7	101,4	101,7	101,6	101,7	101,7	101,2	103,2	104,0	104,0	104,0	104,1	104,1
CA	100,0	100,7	100,7	100,6	100,6	100,5	100,2	101,0	101,2	101,2	101,3	101,3	100,8	103,0	103,8	103,8	103,7	103,7	103,7
CB	100,0	104,3	104,3	104,5	104,5	104,5	104,5	104,5	104,7	104,5	104,5	104,5	104,1	104,5	105,9	105,9	106,5	106,6	106,8
D	99,9	100,4	101,1	102,6	104,7	104,3	103,8	103,3	103,6	103,9	103,6	103,4	102,9	104,0	107,1	108,4	109,2	111,9	116,5
DA	99,9	100,8	100,8	100,8	100,9	101,0	101,6	102,1	102,7	103,8	104,7	104,1	101,9	104,9	106,9	107,1	107,5	107,8	108,3
DB	100,0	99,5	99,5	99,5	99,5	99,5	99,5	99,5	98,9	98,9	98,9	98,9	99,3	96,8	96,8	96,8	96,8	96,8	96,8
DC	99,6	99,8	99,8	99,4	99,0	99,0	99,0	99,1	99,9	99,9	99,3	98,7	99,4	99,1	100,8	99,8	99,1	98,7	99,2
DD	100,0	100,1	100,4	100,3	100,3	100,3	100,3	100,3	100,5	100,5	100,5	100,5	100,3	101,6	102,3	102,6	102,8	103,0	103,0
DE	99,9	99,4	99,8	99,7	100,2	101,1	101,3	101,1	100,6	100,8	99,5	99,8	100,3	98,6	98,4	98,3	98,3	98,3	98,3
DF	101,6	108,8	101,5	87,6	101,1	101,1	98,5	100,7	102,9	114,5	116,6	118,4	104,4	120,1	118,5	123,4	122,4	138,2	150,8
DG	99,8	98,9	101,4	101,1	100,7	101,0	101,3	100,8	100,9	98,0	98,0	98,0	100,0	97,9	97,6	97,2	97,3	97,4	97,4
DH	97,6	97,8	97,4	97,4	102,5	102,5	102,5	102,5	103,5	101,9	104,2	104,6	101,2	102,8	103	103,4	104,3	104,3	104,9
DI	100,0	99,9	100,3	103,4	113,0	113,5	117,7	117,8	118,0	118,4	118,4	118,6	111,6	118,4	118,4	118,8	119,0	121,3	125,8
DJ	100,1	100,3	103,5	111,0	114,7	111,4	104,3	100,7	100,8	100,9	95,5	95,8	103,3	96,6	111,3	114,6	118,2	131,3	154,1
DK	100,0	105,2	105,2	105,0	105,0	105,0	105,8	105,8	105,0	105,0	105,0	105,0	104,8	105,0	105,0	105,0	105,0	105,0	105,0
DL	99,8	99,7	99,7	100,0	99,7	100,0	99,6	99,9	99,6	99,3	99,8	99,5	99,7	109,0	106,2	122,3	121,8	120,1	123,4
DM	100,2	100,2	100,2	100,2	100,2	100,2	100,2	100,3	100,3	100,3	103,5	103,5	100,8	103,5	103,5	103,6	103,6	103,6	103,6
DN	100,7	100,7	100,5	100,0	100,6	101,1	100,5	100,5	100,5	101,0	102,0	101,9	100,8	102,6	102,5	102,6	102,5	103,3	103,5
E	100,0	100,0	100,0	83,7	82,7	82,7	82,7	82,7	82,7	99,0	99,0	99,0	91,2	102,9	102,9	104,4	86,3	86,3	86,3
EA	100,0	100,0	100,0	83,7	82,7	82,7	82,7	82,7	82,7	99,0	99,0	99,0	91,2	102,9	102,9	104,4	86,3	86,3	86,3

**Table 3 – RS Indexes 2007-2008 by NACE aggregations (base Dec 2006=100)**

NACE	Jan 2007	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Mean 2007	Jan 2008	Feb	Mar	Apr	May	Jun
Total	99,6	99,9	100,3	100,4	100,1	100,2	100,6	101,0	102,7	102,6	103,7	103,1	101,2	105,0	108,0	108,5	108,6	110,5	111,7
C	100,6	101,2	101,2	101,2	101,2	100,3	102,8	102,9	113,4	108,2	114,8	115,0	105,2	115,3	112,0	110,6	110,9	110,9	111,6
CA	100,8	101,9	102,0	102,3	102,2	101,9	105,1	105,3	120,9	113,2	122,9	122,9	108,5	120,4	116,6	114,2	114,1	114,1	114,1
CB	100,1	99,8	99,6	99,1	99,0	96,9	97,7	97,7	97,2	97,6	97,4	98,0	98,3	104,3	102,1	103,1	104,2	103,9	106,3
D	99,4	99,3	99,7	100,0	100,8	100,7	100,7	101,8	102,2	102,9	103,8	103,1	101,2	103,9	106,1	106,8	107,9	109,5	111,3
DA	101,7	101,5	101,1	102,7	102,5	102,6	102,4	104,7	105,8	106,9	109,7	110,6	104,4	112,5	114,8	115,4	115,9	116,2	116,6
DB	101,0	101,1	99,5	100,4	96,9	98,0	96,4	94,9	94,1	97,1	97,9	97,9	97,9	95,9	93,2	92,1	94,8	94,4	94,4
DC	99,2	99,8	100,1	98,9	99,1	99,1	99,6	99,6	99,2	100,1	100,7	100,1	99,6	100,4	101,5	102,0	101,3	101,5	101,5
DD	100,2	100,0	101,2	102,1	101,7	101,9	103,3	108,5	108,4	107,8	109,1	109,3	104,5	109,5	110,1	110,8	111,6	110,9	110,2
DE	100,7	101,1	101,6	101,3	101,7	100,2	99,9	100,4	102,5	104,2	103,8	102,3	101,6	103,4	106,1	105,0	105,3	104,7	105,1
DF	100,0	100,0	101,7	101,6	98,5	101,7	101,7	102,5	102,5	102,5	102,5	102,5	101,5	102,5	98,0	101,2	101,6	107,2	107,3
DG	100,1	100,1	100,7	101,0	101,3	101,1	101,5	101,1	101,0	101,0	103,2	103,4	101,3	103,6	104,4	104,1	104,5	104,5	104,3
DH	99,3	97,7	98,2	97,4	96,1	97,5	96,6	96,9	97,5	97,8	97,2	97,2	97,5	100,2	97,6	96,7	96,4	96,6	95,5
DI	98,1	97,9	98,2	97,5	100,1	101,0	99,6	99,6	99,4	99,3	100,2	100,3	99,3	100,7	101,5	102,4	103,6	104,2	105,2
DJ	96,0	96,0	97,0	96,5	99,4	99,0	99,2	98,9	98,8	99,4	99,2	95,9	97,9	95,5	100,9	102,4	105,5	110,4	116,0
DK	102,1	102,1	102,1	102,1	102,1	102,1	103,6	103,6	103,6	103,6	103,6	103,6	102,9	103,6	103,6	103,0	103,0	103,0	103,0
DL	100,4	99,3	99,2	98,9	99,1	97,3	100,6	101,3	100,9	101,8	96,9	96,5	99,4	99,9	99,8	97,5	97,9	97,9	97,2
DM	100,0	100,0	100,7	100,1	99,9	99,9	99,9	99,9	99,9	99,9	99,9	99,9	100,0	99,9	99,9	99,9	99,9	99,9	99,9
DN	101,2	102,6	102,4	101,8	103,5	102,7	102,5	101,7	101,8	103,1	103,8	102,3	102,5	102,8	101,8	105,4	104,1	108,0	112,5
E	99,6	100,7	101,0	101,1	98,4	99,2	99,6	98,8	100,3	100,0	99,8	99,2	99,8	103,6	110,4	111,0	109,1	112,2	112,1
EA	99,6	100,7	101,0	101,1	98,4	99,2	99,6	98,8	100,3	100,0	99,8	99,2	99,8	103,6	110,4	111,0	109,1	112,2	112,1

**Table 4 – Brecko Indexes 2007-2008 by NACE aggregations (base Dec 2006=100)**

NACE	Jan 2007	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Mean 2007	Jan 2008	Feb	Mar	Apr	May	Jun
Total	96,6	99,7	101,2	102,3	98,9	100,1	102,1	104,0	108,6	121,3	129,4	137,0	108,4	143,8	139,1	143,3	144,7	156,9	154,4
D	96,6	99,7	101,2	102,3	98,9	100,1	102,1	104,0	108,6	121,3	129,4	137,0	108,4	143,8	139,1	143,3	144,7	156,9	154,4
DA	96,2	99,2	100,8	102,0	98,3	99,6	101,7	103,6	108,7	122,1	130,8	139,1	108,5	146,6	141,3	145,9	147,3	160,5	157,9
DG	100,0	106,2	106,2	106,2	106,2	106,2	108,3	108,3	108,3	112,4	112,4	112,4	107,8	112,4	112,4	112,4	112,4	112,4	112,4
DN	107,0	107,0	107,0	107,0	107,0	107,0	107,0	107,0	107,0	107,0	107,0	107,0	107,0	106,1	106,1	106,1	106,1	106,1	106,1

**Table 5 – BiH Indexes 2007-2008 by MIGs (base Dec 2006=100)**

MIG	Jan 2007	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Mean 2007	Jan 2008	Feb	Mar	Apr	May	Jun
Total	99,7	100,2	100,7	99,7	100,2	100,1	100,1	100,1	101,1	103,3	103,7	103,7	101,1	105,8	108,1	109,1	107,7	110,0	112,3
Intermediate goods	99,3	99,7	101,0	103,0	106,1	105,3	104,5	104,7	105,1	105,7	105,0	104,7	103,7	105,7	110,2	112,1	113,5	117,6	124,5
Capital goods	100,1	101,0	101,0	101,0	100,9	100,9	100,9	101,0	101,0	100,9	101,6	101,6	101,0	102,4	102,6	102,8	102,9	103,0	103,0
Consumer durables	101,2	100,9	100,7	100,4	100,8	101,1	101,5	101,5	100,9	101,2	101,8	101,7	101,1	102,2	101,8	101,9	101,9	102,4	102,4
Consumer non durables	99,7	100,1	100,1	100,5	100,0	100,2	100,7	100,9	101,6	103,3	105,1	105,5	101,5	108,4	108,5	109,3	109,8	111,9	111,8
Consumer goods	99,8	100,2	100,2	100,5	100,1	100,3	100,7	101,0	101,5	103,2	104,9	105,3	101,5	108,0	108,1	108,8	109,3	111,2	111,1
Energy	99,9	100,6	100,7	95,1	93,9	94,1	94,5	94,4	96,2	101,1	101,8	101,6	97,8	104,7	107,0	107,6	101,0	102,4	102,4

**Table 6 – FBiH Indexes 2007-2008 by MIGs (base Dec 2006=100)**

MIG	Jan 2007	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Mean 2007	Jan 2008	Feb	Mar	Apr	May	Jun
Total	99,9	100,4	100,9	99,1	100,3	100,0	99,7	99,4	99,7	102,8	102,5	102,4	100,6	103,7	106,0	107,1	104,6	106,5	109,8
Intermediate goods	99,7	100,3	102,0	105,4	109,5	108,5	107,0	106,1	106,5	106,8	105,3	105,6	105,2	106,6	112,1	114,6	115,9	121,2	130,8
Capital goods	100,1	101,6	101,6	101,6	101,6	101,6	101,5	101,6	101,6	101,6	102,9	103,0	101,7	103,7	103,9	104,1	104,1	104,1	104,1
Consumer durables	100,6	100,5	100,2	99,7	100,3	100,7	101,1	101,1	100,3	100,7	101,6	101,5	100,7	102,1	102,0	102,0	102,0	102,7	102,8
Consumer non durables	100,0	100,2	100,1	100,0	100,1	100,2	100,8	100,7	101,0	101,2	101,7	100,9	100,6	101,2	102,2	102,4	102,8	103,0	103,3
Consumer goods	100,0	100,2	100,2	100,0	100,1	100,2	100,8	100,8	100,9	101,2	101,7	101,0	100,6	101,3	102,3	102,4	102,8	103,0	103,3
Energy	100,0	100,4	100,3	90,1	89,7	89,6	89,5	89,8	89,9	100,0	100,1	100,1	95,0	103,1	103,4	104,4	93,5	93,7	93,8



**Table 7 – RS Indexes 2007-2008 by MIGs (base Dec 2006=100)**

MIG	Jan 2007	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Mean 2007	Jan 2008	Feb	Mar	Apr	May	Jun
Total	99,6	99,9	100,3	100,4	100,1	100,2	100,6	101,0	102,7	102,6	103,7	103,1	101,2	105,0	108,0	108,5	108,6	110,5	111,7
Intermediate goods	98,8	98,8	99,5	99,4	101,0	100,6	100,9	102,5	103,1	104,0	104,6	103,4	101,4	104,2	107,2	108,2	109,9	112,3	115,3
Capital goods	100,0	99,4	99,4	99,4	99,2	99,2	99,4	99,5	99,4	99,3	98,5	98,1	99,2	99,1	99,2	99,3	99,6	100,2	99,9
Consumer durables	102,5	101,5	101,6	101,8	101,7	101,7	102,0	102,0	102,0	102,0	102,0	102,0	102,0	102,1	101,0	101,4	101,2	101,2	101,2
Consumer non durables	100,3	100,4	99,9	101,0	100,5	100,6	100,0	100,1	100,1	100,7	102,7	102,9	100,8	104,6	105,7	106,0	106,2	106,1	106,4
Consumer goods	100,5	100,5	100,0	101,0	100,6	100,7	100,1	100,2	100,2	100,8	102,7	102,8	100,8	104,4	105,4	105,6	105,8	105,7	106,0
Energy	99,8	100,8	101,2	101,3	99,0	99,7	100,6	100,1	103,9	102,4	103,9	103,5	101,4	106,5	111,2	111,3	109,8	112,4	112,4

**Table 8 – Breko Indexes 2007-2008 by MIGs (base Dec 2006=100)**

MIG	Jan 2007	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Mean 2007	Jan 2008	Feb	Mar	Apr	May	Jun
Total	96,6	99,7	101,2	102,3	98,9	100,1	102,1	104,0	108,6	121,3	129,4	137,0	108,4	143,8	139,1	143,3	144,7	156,9	154,4
Intermediate goods	100,0	102,9	103,0	103,0	103,0	103,0	103,9	104,0	103,7	105,6	105,6	105,6	103,6	110,4	111,9	113,0	114,0	112,5	111,8
Consumer durables	107,0	107,0	107,0	107,0	107,0	107,0	107,0	107,0	107,0	107,0	107,0	107,0	107,0	106,1	106,1	106,1	106,1	106,1	106,1
Consumer non durables	95,9	99,1	100,9	102,1	98,2	99,6	101,8	103,9	109,4	123,9	133,2	142,1	109,2	149,5	143,5	148,4	149,6	164,4	161,7
Consumer goods	96,1	99,3	101,0	102,2	98,3	99,7	101,9	104,0	109,3	123,6	132,8	141,6	109,2	148,8	142,9	147,7	149,0	163,5	160,9

**Table 9 – BIH month to month indices rates of change 2007-2008 by NACE aggregations (base Dec 2006=100)**

NACE	Jan 2007	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Mean 2007	Jan 2008	Feb	Mar	Apr	May	Jun
Total	-0,3	+0,5	+0,5	-1,0	+0,5	-0,1	0,0	0,0	+1,0	+2,2	+0,4	0,0	+0,3	+2,0	+2,2	+0,9	-1,3	+2,1	+2,1
C	+0,2	+1,0	-0,1	+0,0	+0,0	-0,3	+0,6	+0,5	+3,5	-1,7	+2,1	+0,1	+0,5	+1,4	-0,7	-0,5	+0,1	+0,1	+0,2
CA	+0,2	+0,8	+0,1	0,0	-0,1	-0,1	+0,6	+0,7	+4,3	-2,0	+2,6	0,0	+0,6	+1,2	-0,6	-0,6	-0,1	0,0	0,0
CB	+0,1	+1,8	-0,1	-0,2	0,0	-1,2	+0,5	0,0	-0,2	+0,1	-0,1	+0,3	+0,1	+3,4	-0,5	+0,5	+0,9	-0,1	+1,2
D	-0,4	+0,4	+0,7	+1,1	+1,4	-0,2	-0,3	+0,1	+0,6	+1,0	+0,4	+0,0	+0,4	+1,4	+2,3	+1,2	+0,8	+2,6	+2,9
DA	0,0	+0,8	+0,1	+0,5	-0,4	+0,3	+0,5	+1,1	+1,3	+2,4	+2,1	+0,7	+0,8	+3,0	+0,9	+0,8	+0,5	+1,9	0,0
DB	+0,5	-0,2	-0,8	-1,0	-1,9	+0,6	-0,8	-0,8	-0,7	+1,6	+0,5	0,0	-0,1	-2,1	-1,5	-0,6	+1,5	-0,2	0,0
DC	-0,7	+0,5	+0,2	-1,0	+0,1	0,0	+0,3	+0,1	-0,1	+0,6	+0,3	-0,6	0,0	+0,3	+1,3	+0,1	-0,7	0,0	+0,2
DD	+0,1	0,0	+0,7	+0,3	-0,2	+0,1	+0,7	+2,4	0,0	-0,2	+0,6	0,0	+0,4	+0,9	+0,6	+0,5	+0,5	-0,2	-0,4
DE	+0,3	-0,1	+0,4	-0,2	+0,5	-0,2	0,0	+0,1	+0,6	+0,9	-0,9	-0,5	+0,1	-0,1	+1,1	-0,6	+0,2	-0,3	+0,2
DF	+0,5	+2,2	-1,1	-4,2	+2,1	+2,2	-0,8	+1,2	+0,7	+3,5	+0,7	+0,5	+0,6	+1,0	-3,2	+3,6	-0,1	+8,4	+3,7
DG	-0,2	-0,4	+2,2	-0,2	-0,3	+0,2	+0,4	-0,5	+0,1	-2,1	+0,2	+0,1	0,0	+0,1	-0,2	-0,3	+0,1	+0,1	-0,1
DH	-1,8	-0,4	-0,1	-0,3	+2,9	+0,5	-0,3	+0,1	+0,8	-0,9	+1,3	+0,2	+0,2	0,0	-0,8	0,0	+0,5	0,0	0,0
DI	-0,5	-0,1	+0,4	+2,1	+7,8	+0,5	+2,5	+0,1	+0,1	+0,3	+0,2	+0,2	+1,1	+0,4	+0,2	+0,4	+0,3	+1,7	+3,1
DJ	-1,7	+0,1	+2,2	+4,0	+3,3	-1,9	-3,6	-2,2	0,0	+0,3	-3,1	-1,3	-0,3	+0,3	+11,0	+2,3	+3,1	+8,4	+12,4
DK	+0,2	+4,7	0,0	-0,2	0,0	0,0	+0,9	0,0	-0,7	0,0	0,0	0,0	+0,4	0,0	0,0	-0,1	0,0	0,0	0,0
DL	-0,1	-0,3	0,0	+0,1	-0,1	-0,2	+0,4	+0,4	-0,3	0,0	-0,8	-0,3	-0,1	+8,4	-2,1	+11,7	-0,3	-1,2	+2,2
DM	+0,2	0,0	+0,1	-0,1	0,0	0,0	0,0	0,0	0,0	0,0	+2,8	0,0	+0,3	0,0	0,0	+0,1	0,0	0,0	0,0
DN	+1,0	+0,7	-0,2	-0,6	+1,1	-0,1	-0,4	-0,3	0,0	+0,9	+0,8	-0,7	+0,2	+0,6	-0,5	+1,6	-0,6	+2,1	+2,0
E	-0,2	+0,6	+0,1	-7,9	-1,9	+0,4	+0,2	-0,4	+0,8	+8,5	-0,1	-0,3	0,0	+4,2	+3,4	+0,9	-8,9	+1,6	0,0
EA	-0,2	+0,6	+0,1	-7,9	-1,9	+0,4	+0,2	-0,4	+0,8	+8,5	-0,1	-0,3	0,0	+4,2	+3,4	+0,9	-8,9	+1,6	0,0

**Table 10 – FBIH month to month indices rates of change 2007-2008 by NACE aggregations (base Dec 2006=100)**

NACE	Jan 2007	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Mean 2007	Jan 2008	Feb	Mar	Apr	May	Jun
Total	-0,1	+0,5	+0,5	-1,8	+1,2	-0,3	-0,3	-0,3	+0,3	+3,1	-0,3	-0,1	+0,2	+1,3	+2,2	+1,0	-2,3	+1,8	+3,1
C	0,0	+1,2	-0,1	0,0	0,0	-0,1	-0,3	+0,7	+0,3	-0,1	+0,1	0,0	+0,1	+1,5	+0,8	0,0	0,0	+0,1	0,0
CA	0,0	+0,7	0,0	-0,1	0,0	-0,1	-0,3	+0,8	+0,2	0,0	+0,1	0,0	+0,1	+1,7	+0,8	0,0	-0,1	0,0	0,0
CB	0,0	+4,3	0,0	+0,2	0,0	0,0	0,0	0,0	+0,2	-0,2	0,0	0,0	+0,4	0,0	+1,3	0,0	+0,6	+0,1	+0,2
D	-0,1	+0,5	+0,7	+1,5	+2,0	-0,4	-0,5	-0,5	+0,3	+0,3	-0,3	-0,2	+0,3	+0,6	+3,0	+1,2	+0,7	+2,5	+4,1
DA	-0,1	+0,9	0,0	0,0	+0,1	+0,1	+0,6	+0,5	+0,6	+1,1	+0,9	-0,6	+0,3	+0,8	+1,9	+0,2	+0,4	+0,3	+0,5
DB	0,0	-0,5	0,0	0,0	0,0	0,0	0,0	0,0	-0,6	0,0	0,0	0,0	-0,1	-2,1	0,0	0,0	0,0	0,0	0,0
DC	-0,4	+0,2	0,0	-0,4	-0,4	0,0	0,0	+0,1	+0,8	0,0	-0,6	-0,6	-0,1	+0,4	+1,7	-1,0	-0,7	-0,4	+0,5
DD	0,0	+0,1	+0,3	-0,1	0,0	0,0	0,0	0,0	+0,2	0,0	0,0	0,0	0,0	+1,1	+0,7	+0,3	+0,2	+0,2	0,0
DE	-0,1	-0,5	+0,4	-0,1	+0,5	+0,9	+0,2	-0,2	-0,5	+0,2	-1,3	+0,3	0,0	-1,2	-0,2	-0,1	0,0	0,0	0,0
DF	+1,6	+7,1	-6,7	-13,7	+15,4	0,0	-2,6	+2,2	+2,2	+11,3	+1,8	+1,5	+1,7	+1,4	-1,3	+4,1	-0,8	+12,9	+9,1
DG	-0,2	-0,9	+2,5	-0,3	-0,4	+0,3	+0,3	-0,5	+0,1	-2,9	0,0	0,0	-0,2	-0,1	-0,3	-0,4	+0,1	+0,1	0,0
DH	-2,4	+0,2	-0,4	+0,0	+5,2	0,0	0,0	0,0	+1,0	-1,5	+2,3	+0,4	+0,4	-1,7	+0,2	+0,4	+0,9	0,0	+0,6
DI	0,0	-0,1	+0,4	+3,1	+9,3	+0,4	+3,7	+0,1	+0,2	+0,3	0,0	+0,2	+1,5	-0,2	0,0	+0,3	+0,2	+1,9	+3,7
DJ	+0,1	+0,2	+3,2	+7,2	+3,3	-2,9	-6,4	-3,5	+0,1	+0,1	-5,4	+0,3	-0,3	+0,8	+15,2	+3,0	+3,1	+11,1	+17,4
DK	0,0	+5,2	0,0	-0,2	0,0	0,0	+0,8	0,0	-0,8	0,0	0,0	0,0	+0,4	0,0	0,0	0,0	0,0	0,0	0,0
DL	-0,2	-0,1	0,0	+0,3	-0,3	+0,3	-0,4	+0,3	-0,3	-0,3	+0,5	-0,3	0,0	+9,5	-2,6	+15,2	-0,4	-1,4	+2,7
DM	+0,2	0,0	0,0	0,0	0,0	0,0	0,0	+0,1	0,0	0,0	+3,2	0,0	+0,3	0,0	+0,0	+0,1	0,0	0,0	0,0
DN	+0,7	0,0	-0,2	-0,5	+0,6	+0,5	-0,6	0,0	0,0	+0,5	+1,0	-0,1	+0,2	+0,7	-0,1	+0,1	-0,1	+0,8	+0,2
E	0,0	0,0	0,0	-16,3	-1,2	0,0	0,0	0,0	0,0	+19,7	0,0	0,0	+0,2	+3,9	0,0	+1,5	-17,3	0,0	0,0
EA	0,0	0,0	0,0	-16,3	-1,2	0,0	0,0	0,0	0,0	+19,7	0,0	0,0	+0,2	+3,9	0,0	+1,5	-17,3	0,0	0,0

**Table 11 – RS month to month indices rates of change 2007-2008 by NACE aggregations (base Dec 2006=100)**

NACE	Jan 2007	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Mean 2007	Jan 2008	Feb	Mar	Apr	May	Jun
Total	-0,4	+0,3	+0,4	+0,1	-0,3	+0,1	+0,4	+0,4	+1,7	-0,1	+1,1	-0,6	+0,3	+1,8	+2,9	+0,5	+0,1	+1,7	+1,1
C	+0,6	+0,6	0,0	0,0	0,0	-0,9	+2,5	+0,1	+10,2	-4,6	+6,1	+0,2	+1,2	+0,3	-2,9	-1,3	+0,3	0,0	+0,6
CA	+0,8	+1,1	+0,1	+0,3	-0,1	-0,3	+3,1	+0,2	+14,8	-6,4	+8,6	0,0	+1,9	-2,0	-3,2	-2,1	-0,1	0,0	0,0
CB	+0,1	-0,3	-0,2	-0,5	-0,1	-2,1	+0,8	0,0	-0,5	+0,4	-0,2	+0,6	-0,2	+6,4	-2,1	+1,0	+1,1	-0,3	+2,3
D	-0,6	-0,1	+0,4	+0,3	+0,8	-0,1	0,0	+1,1	+0,4	+0,7	+0,9	-0,7	+0,3	+0,8	+2,1	+0,7	+1,0	+1,5	+1,6
DA	+1,7	-0,2	-0,4	+1,6	-0,2	+0,1	-0,2	+2,2	+1,1	+1,0	+2,6	+0,8	+0,8	+1,7	+2,0	+0,5	+0,4	+0,3	+0,3
DB	+1,0	+0,1	-1,6	+0,9	-3,5	+1,1	-1,6	-1,6	-0,8	+3,2	+0,8	0,0	-0,2	-2,0	-2,8	-1,2	+2,9	-0,4	0,0
DC	-0,8	+0,6	+0,3	-1,2	+0,2	0,0	+0,5	0,0	-0,4	+0,9	+0,6	-0,6	0,0	+0,3	+1,1	+0,5	-0,7	+0,2	0,0
DD	+0,2	-0,2	+1,2	+0,9	-0,4	+0,2	+1,4	+5,0	-0,1	-0,6	+1,2	+0,2	+0,8	+0,2	+0,5	+0,6	+0,7	-0,6	-0,6
DE	+0,7	+0,4	+0,5	-0,3	+0,4	-1,5	-0,3	+0,5	+2,1	+1,7	-0,4	-1,4	+0,2	+1,1	+2,6	-1,0	+0,3	-0,6	+0,4
DF	0,0	0,0	+1,7	-0,1	-3,1	+3,2	0,0	+0,8	0,0	0,0	0,0	0,0	+0,2	0,0	-4,4	+3,3	+0,4	+5,5	+0,1
DG	+0,1	0,0	+0,6	+0,3	+0,3	-0,2	+0,4	-0,4	-0,1	0,0	+2,2	+0,2	+0,3	+0,2	+0,8	-0,3	+0,4	0,0	-0,2
DH	-0,7	-1,6	+0,5	-0,8	-1,3	+1,5	-0,9	+0,3	+0,6	+0,3	-0,6	0,0	-0,2	+3,1	-2,6	-0,9	-0,3	+0,2	-1,1
DI	-1,9	-0,2	+0,3	-0,7	+2,7	+0,9	-1,4	0,0	-0,2	-0,1	+0,9	+0,1	0,0	+0,4	+0,8	+0,9	+1,2	+0,6	+1,0
DJ	-4,0	0,0	+1,0	-0,5	+3,0	-0,4	+0,2	-0,3	-0,1	+0,6	-0,2	-3,3	-0,3	-0,4	+5,7	+1,5	+3,0	+4,6	+5,1
DK	+2,1	0,0	0,0	0,0	0,0	0,0	+1,5	0,0	0,0	0,0	0,0	0,0	+0,3	0,0	0,0	-0,6	0,0	0,0	0,0
DL	+0,4	-1,1	-0,1	-0,3	+0,2	-1,8	+3,4	+0,7	-0,4	+0,9	-4,8	-0,4	-0,3	+3,5	-0,1	-2,3	+0,4	0,0	-0,7
DM	0,0	0,0	+0,7	-0,6	-0,2	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
DN	+1,2	+1,4	-0,2	-0,6	+1,7	-0,8	-0,2	-0,8	+0,1	+1,3	+0,7	-1,4	+0,2	+0,5	-1,0	+3,5	-1,2	+3,7	+4,2
E	-0,4	+1,1	+0,3	+0,1	-2,7	+0,8	+0,4	-0,8	+1,5	-0,3	-0,2	-0,6	-0,1	+4,4	+6,6	+0,5	-1,7	+2,8	-0,1
EA	-0,4	+1,1	+0,3	+0,1	-2,7	+0,8	+0,4	-0,8	+1,5	-0,3	-0,2	-0,6	-0,1	+4,4	+6,6	+0,5	-1,7	+2,8	-0,1

**Table 12 – Breko month to month indices rates of change 2007-2008 by NACE aggregations (base Dec 2006=100)**

NACE	Jan 2007	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Mean 2007	Jan 2008	Feb	Mar	Apr	May	Jun
Total	-3,4	+3,2	+1,5	+1,1	-3,3	+1,2	+2,0	+1,9	+4,4	+11,7	+6,7	+5,9	+2,7	+5,0	-3,3	+3,0	+1,0	+8,4	-1,6
D	-3,4	+3,2	+1,5	+1,1	-3,3	+1,2	+2,0	+1,9	+4,4	+11,7	+6,7	+5,9	+2,7	+5,0	-3,3	+3,0	+1,0	+8,4	-1,6
DA	-3,8	+3,1	+1,6	+1,2	-3,6	+1,3	+2,1	+1,9	+4,9	+12,3	+7,1	+6,3	+2,9	+5,4	-3,6	+3,3	+1,0	+9,0	-1,6
DG	0,0	+6,2	0,0	0,0	0,0	0,0	+2,0	0,0	0,0	+3,8	0,0	0,0	+1,0	0,0	0,0	0,0	0,0	0,0	0,0
DN	+7,0	+0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	+0,6	-0,8	0,0	0,0	0,0	0,0	0,0

**Table 13 – BiH month to month indices rates of change 2007-2008 by MIGs (base Dec 2006=100)**

MIG	Jan 2007	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Mean 2007	Jan 2008	Feb	Mar	Apr	May	Jun
Total	-0,3	+0,5	+0,5	-1,0	+0,5	-0,1	0,0	0,0	+1,0	+2,2	+0,4	0,0	+0,3	+2,0	+2,2	+0,9	-1,3	+2,1	+2,1
Intermediate goods	-0,7	+0,4	+1,3	+2,0	+3,0	-0,8	-0,8	+0,2	+0,4	+0,6	-0,7	-0,3	+0,4	+1,0	+4,3	+1,7	+1,2	+3,6	+5,9
Capital goods	+0,1	+0,9	0,0	0,0	-0,1	0,0	0,0	+0,1	0,0	-0,1	+0,7	0,0	+0,1	+0,8	+0,2	+0,2	+0,1	+0,1	0,0
Consumer durables	+1,2	-0,3	-0,2	-0,3	+0,4	+0,3	+0,4	0,0	-0,6	+0,3	+0,6	-0,1	+0,1	+0,5	-0,4	+0,1	0,0	+0,5	0,0
Consumer non durables	-0,3	+0,4	0,0	+0,4	-0,5	+0,2	+0,5	+0,2	+0,7	+1,7	+1,7	+0,4	+0,4	+2,7	+0,1	+0,7	+0,5	+1,9	-0,1
Consumer goods	-0,2	+0,4	0,0	+0,3	-0,4	+0,2	+0,4	+0,3	+0,5	+1,7	+1,6	+0,4	+0,4	+2,6	+0,1	+0,6	+0,5	+1,7	-0,1
Energy	-0,1	+0,7	+0,1	-5,6	-1,3	+0,2	+0,4	-0,1	+1,9	+5,1	+0,7	-0,2	+0,2	+3,1	+2,2	+0,6	-6,1	+1,4	0,0

**Table 14 – FBiH month to month indices rates of change 2007-2008 by MIGs (base Dec 2006=100)**

MIG	Jan 2007	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Mean 2007	Jan 2008	Feb	Mar	Apr	May	Jun
Total	-0,1	+0,5	+0,5	-1,8	+1,2	-0,3	-0,3	-0,3	+0,3	+3,1	-0,3	-0,1	+0,2	+1,3	+2,2	+1,0	-2,3	+1,8	+3,1
Intermediate goods	-0,3	+0,6	+1,7	+3,3	+3,9	-0,9	-1,4	-0,8	+0,4	+0,3	-1,4	+0,3	+0,5	+0,9	+5,2	+2,2	+1,1	+4,6	+7,9
Capital goods	+0,1	+1,5	0,0	0,0	0,0	0,0	-0,1	+0,1	0,0	0,0	+1,3	+0,1	+0,2	+0,7	+0,2	+0,2	0,0	0,0	0,0
Consumer durables	+0,6	-0,1	-0,3	-0,5	+0,6	+0,4	+0,4	+0,0	-0,8	+0,4	+0,9	-0,1	+0,1	+0,6	-0,1	0,0	0,0	+0,7	+0,1
Consumer non durables	0,0	+0,2	-0,1	-0,1	+0,1	+0,1	+0,6	-0,1	+0,3	+0,2	+0,5	-0,8	+0,1	+0,3	+1,0	+0,2	+0,4	+0,2	+0,3
Consumer goods	0,0	+0,2	0,0	-0,2	+0,1	+0,1	+0,6	0,0	+0,1	+0,3	+0,5	-0,7	+0,1	+0,3	+1,0	+0,1	+0,4	+0,2	+0,3
Energy	0,0	+0,4	-0,1	-10,2	-0,4	-0,1	-0,1	+0,3	+0,1	+11,2	+0,1	0,0	+0,1	+3,0	+0,3	+1,0	-10,4	+0,2	+0,1

**Table 15 – RS month to month indices rates of change 2007-2008 by MIGs (base Dec 2006=100)**

MIG	Jan 2007	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Mean 2007	Jan 2008	Feb	Mar	Apr	May	Jun
Total	-0,4	+0,3	+0,4	+0,1	-0,3	+0,1	+0,4	+0,4	+1,7	-0,1	+1,1	-0,6	+0,3	+1,8	+2,9	+0,5	+0,1	+1,7	+1,1
Intermediate goods	-1,2	0,0	+0,7	-0,1	+1,6	-0,4	+0,3	+1,6	+0,6	+0,9	+0,6	-1,1	+0,3	+0,8	+2,9	+0,9	+1,6	+2,2	+2,7
Capital goods	0,0	-0,6	0,0	0,0	-0,2	0,0	+0,2	+0,1	-0,1	-0,1	-0,8	-0,4	-0,2	+1,0	+0,1	+0,1	+0,3	+0,6	-0,3
Consumer durables	+2,5	-1,0	+0,1	+0,2	-0,1	0,0	+0,3	0,0	0,0	0,0	0,0	0,0	+0,2	+0,1	-1,1	+0,4	-0,2	0,0	0,0
Consumer non durables	+0,3	+0,1	-0,5	+1,1	-0,5	+0,1	-0,6	+0,1	0,0	+0,6	+2,0	+0,2	+0,2	+1,7	+1,1	+0,3	+0,2	-0,1	+0,3
Consumer goods	+0,5	0,0	-0,5	+1,0	-0,4	+0,1	-0,6	+0,1	0,0	+0,6	+1,9	+0,1	+0,2	+1,6	+1,0	+0,2	+0,2	-0,1	+0,3
Energy	-0,2	+1,0	+0,4	+0,1	-2,3	+0,7	+0,9	-0,5	+3,8	-1,4	+1,5	-0,4	+0,3	+2,9	+4,4	+0,1	-1,3	+2,4	0,0

**Table 16 – Brecko month to month indices rates of change 2007-2008 by MIGs (base Dec 2006=100)**

MIG	Jan 2007	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Mean 2007	Jan 2008	Feb	Mar	Apr	May	Jun
Total	-3,4	+3,2	+1,5	+1,1	-3,3	+1,2	+2,0	+1,9	+4,4	+11,7	+6,7	+5,9	+2,7	+5,0	-3,3	+3,0	+1,0	+8,4	-1,6
Intermediate goods	0,0	+2,9	+0,1	0,0	0,0	0,0	+0,9	+0,1	-0,3	+1,8	0,0	0,0	+0,5	+4,5	+1,4	+1,0	+0,9	-1,3	-0,6
Consumer durables	+7,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	+0,6	-0,8	0,0	0,0	0,0	0,0	0,0
Consumer non durables	-4,1	+3,3	+1,8	+1,2	-3,8	+1,4	+2,2	+2,1	+5,3	+13,3	+7,5	+6,7	+3,1	+5,2	-4,0	+3,4	+0,8	+9,9	-1,6
Consumer goods	-3,9	+3,3	+1,7	+1,2	-3,8	+1,4	+2,2	+2,1	+5,1	+13,1	+7,4	+6,6	+3,0	+5,1	-4,0	+3,4	+0,9	+9,7	-1,6

**Table 17 – BiH twelve-month indices rates of change. Year 2008 (base Dec 2006=100)**

NACE	Jan 2008	Feb	Mar	Apr	May	Jun
Total	+6,1	+7,9	+8,3	+8,0	+9,8	+12,2
C	+7,3	+5,5	+5,1	+5,2	+5,3	+5,9
CA	+8,3	+6,7	+5,9	+5,8	+5,9	+6,0
CB	+4,3	+2,0	+2,6	+3,6	+3,5	+6,1
D	+6,7	+8,7	+9,2	+8,9	+10,3	+13,7
DA	+13,0	+13,1	+13,9	+13,9	+16,5	+16,2
DB	-4,2	-5,4	-5,2	-4,3	-2,7	-3,2
DC	+0,7	+1,5	+1,4	+1,7	+1,6	+1,8
DD	+5,3	+5,9	+5,7	+5,8	+5,8	+5,3
DE	+0,5	+1,7	+0,7	+1,1	+0,3	+0,7
DF	+8,0	+2,2	+7,1	+11,7	+18,6	+20,3
DG	-0,2	0,0	-2,5	-2,2	-1,8	-2,1
DH	+3,8	+3,4	+3,5	+4,3	+1,4	+0,9
DI	+15,1	+15,4	+15,4	+13,4	+7,1	+9,9
DJ	-2,2	+8,4	+8,5	+7,6	+13,1	+29,7
DK	+4,7	0,0	-0,1	+0,1	+0,1	+0,1
DL	+7,2	+5,2	+17,6	+17,2	+15,9	+18,6
DM	+2,8	+2,8	+2,8	+2,9	+2,9	+2,9
DN	+1,8	+0,6	+2,4	+2,4	+3,4	+5,6
E	+3,5	+6,4	+7,3	+6,0	+9,9	+9,4
EA	+3,5	+6,4	+7,3	+6,0	+9,9	+9,4

**Table 18 – FBiH twelve-month indices rates of change. Year 2008 (base Dec 2006=100)**

NACE	Jan 2008	Feb	Mar	Apr	May	Jun
Total	+3,8	+5,6	+6,1	+5,5	+6,2	+9,8
C	+3,2	+2,8	+2,9	+2,9	+3,0	+3,1
CA	+3,0	+3,1	+3,1	+3,1	+3,1	+3,2
CB	+4,5	+1,5	+1,5	+1,9	+2,0	+2,2
D	+4,1	+6,7	+7,2	+6,4	+6,9	+11,7
DA	+5,0	+6,1	+6,3	+6,6	+6,8	+7,2
DB	-3,2	-2,7	-2,7	-2,7	-2,7	-2,7
DC	-0,5	+1,0	0,0	-0,3	-0,3	+0,2
DD	+1,6	+2,2	+2,2	+2,5	+2,7	+2,7
DE	-1,3	-1,0	-1,5	-1,4	-1,9	-2,8
DF	+18,2	+8,9	+21,6	+39,7	+36,7	+49,2
DG	-1,9	-1,3	-4,1	-3,8	-3,3	-3,6
DH	+5,3	+5,3	+6,2	+7,1	+1,8	+2,3
DI	+18,4	+18,5	+18,4	+15,1	+7,3	+10,8
DJ	-3,5	+11,0	+10,7	+6,5	+14,5	+38,3
DK	+5,0	-0,2	-0,2	0,0	0,0	0,0
DL	+9,2	+6,5	+22,7	+21,8	+20,5	+23,4
DM	+3,3	+3,3	+3,4	+3,4	+3,4	+3,4
DN	+1,9	+1,8	+2,1	+2,5	+2,7	+2,4
E	+2,9	+2,9	+4,4	+3,1	+4,4	+4,4
EA	+2,9	+2,9	+4,4	+3,1	+4,4	+4,4

**Table 19 – RS twelve-month indices rates of change. Year 2008 (base Dec 2006=100)**

NACE	Jan 2008	Feb	Mar	Apr	May	Jun
Total	+5,4	+8,1	+8,2	+8,2	+10,4	+11,5
C	+14,6	+10,7	+9,3	+9,6	+9,6	+11,3
CA	+19,4	+14,4	+12,0	+11,5	+11,6	+12,0
CB	+4,2	+2,3	+3,5	+5,1	+4,9	+9,7
D	+4,5	+6,8	+7,1	+7,9	+8,6	+10,5
DA	+10,6	+13,1	+14,1	+12,9	+13,4	+13,6
DB	-5,0	-7,8	-7,4	-5,6	-2,6	-3,7
DC	+1,2	+1,7	+1,9	+2,4	+2,4	+2,4
DD	+9,3	+10,1	+9,5	+9,3	+9,0	+8,1
DE	+2,7	+4,9	+3,3	+3,9	+2,9	+4,9
DF	+2,5	-2,0	-0,5	0,0	+8,8	+5,5
DG	+3,5	+4,3	+3,4	+3,5	+3,2	+3,2
DH	+0,9	-0,1	-1,5	-1,0	+0,5	-2,1
DI	+2,7	+3,7	+4,3	+6,3	+4,1	+4,2
DJ	-0,5	+5,1	+5,6	+9,3	+11,1	+17,2
DK	+1,5	+1,5	+0,9	+0,9	+0,9	+0,9
DL	-0,5	+0,5	-1,7	-1,0	-1,2	-0,1
DM	-0,1	-0,1	-0,8	-0,2	0,0	0,0
DN	+1,6	-0,8	+2,9	+2,3	+4,3	+9,5
E	+4,0	+9,6	+9,9	+7,9	+14,0	+13,0
EA	+4,4	+6,6	+0,5	-1,7	+2,8	-0,1

**Table 20 – Brcko twelve-month indices rates of change. Year 2008 (base Dec 2006=100)**

NACE	Jan 2008	Feb	Mar	Apr	May	Jun
Total	+48,9	+39,5	+41,6	+41,4	+58,6	+54,2
D	+48,9	+39,5	+41,6	+41,4	+58,6	+54,2
DA	+52,4	+42,4	+44,7	+44,4	+63,3	+58,5
DG	+12,4	+5,8	+5,8	+5,8	+5,8	+5,8
DN	-0,8	-0,8	-0,8	-0,8	-0,8	-0,8

**Table 21 – BiH twelve-month indices rates of change. Year 2008 by MIGs (base Dec 2006=100)**

MIG	Jan 2008	Feb	Mar	Apr	May	Jun
Total	+6,1	+7,9	+8,3	+8,0	+9,8	+12,2
Intermediate goods	+6,4	+10,5	+11,0	+10,2	+10,8	+18,2
Capital goods	+2,3	+1,6	+1,8	+1,9	+2,1	+2,1
Consumer durables	+1,0	+0,9	+1,2	+1,5	+1,6	+1,3
Consumer non durables	+8,7	+8,4	+9,2	+9,3	+11,9	+11,6
Consumer goods	+8,2	+7,9	+8,6	+8,8	+11,1	+10,8
Energy	+4,8	+6,4	+6,9	+6,2	+9,1	+8,8



**Table 22 – FBiH twelve-month indices rates of change. Year 2008 by MIGs (base Dec 2006=100)**

MIG	Jan 2008	Feb	Mar	Apr	May	Jun
Total	+3,8	+5,6	+6,1	+5,5	+6,2	+9,8
Intermediate goods	+6,9	+11,8	+12,4	+10,0	+10,7	+20,6
Capital goods	+3,6	+2,3	+2,5	+2,5	+2,5	+2,5
Consumer durables	+1,5	+1,5	+1,8	+2,3	+2,4	+2,1
Consumer non durables	+1,2	+2,0	+2,3	+2,8	+2,9	+3,1
Consumer goods	+1,3	+2,1	+2,2	+2,8	+2,9	+3,1
Energy	+3,1	+3,0	+4,1	+3,8	+4,5	+4,7

**Table 23 – RS twelve-month indices rates of change. Year 2008 by MIGs (base Dec 2006=100)**

MIG	Jan 2008	Feb	Mar	Apr	May	Jun
Total	+5,4	+8,1	+8,2	+8,2	+10,4	+11,5
Intermediate goods	+5,5	+8,5	+8,7	+10,6	+11,2	+14,6
Capital goods	-0,9	-0,2	-0,1	+0,2	+1,0	+0,7
Consumer durables	-0,4	-0,5	-0,2	-0,6	-0,5	-0,5
Consumer non durables	+4,3	+5,3	+6,1	+5,1	+5,6	+5,8
Consumer goods	+3,9	+4,9	+5,6	+4,8	+5,1	+5,3
Energy	+6,7	+10,3	+10,0	+8,4	+13,5	+12,7

**Table 24 – Brcko twelve-month indices rates of change. Year 2008 by MIGs (base Dec 2006=100)**

MIG	Jan 2008	Feb	Mar	Apr	May	Jun
Total	+48,9	+39,5	+41,6	+41,4	+58,6	+54,2
Intermediate goods	+10,4	+8,7	+9,7	+10,7	+9,2	+8,5
Consumer durables	-0,8	-0,8	-0,8	-0,8	-0,8	-0,8
Consumer non durables	+55,9	+44,8	+47,1	+46,5	+67,4	+62,3
Consumer goods	+54,8	+43,9	+46,2	+45,8	+66,3	+61,4

## **Glossary**

**Aggregate (of a classification):** an activity or a commodity within a classification context. In a wide sense, phenomena are appropriately classified in elementary items. These items are elementary aggregates.

**Aggregation (of indices):** the synthesis operations on indices. The aggregation of producer price indices manages price relatives and Laspeyres indices up to the overall index.

**Base price:** the base price is the denominator of the ratio between the current price (numerator) and the base price. When indices are (annually) chained on a monthly base, the base price is the price of December of the previous year.

**Calculation base indices:** the calculation base, in a monthly chained producer price index, is the set of indices concerning the month of December of the previous year.

**Chain indices (or chained indices):** indices constructed by chaining (by multiplication) linking coefficients.

**Elementary price (item price):** price referred to a specific product manufactured by the enterprises. Elementary prices are synthesized by the simple geometric mean: the result is the elementary product index.

**Enterprise:** is the survey unit (or respondent unit or reporting unit). The enterprise monthly surveys its items price and transmits them to the NSI.

**Frequency:** the data collection frequency concerns the times at which data are collected. The dissemination frequency refers the data release times.

**Micro data:** the elementary units defined as a ratio between two prices: the current and the base price.

**Macro data:** the aggregate indices. In the PPI structure, macro data deals with product indices up to the overall one.

**Questionnaire:** the form that the reporting units have to fill in monthly.

**Rate of change:** the index rate of change between two times measures. The index increases (or decreases) during the period limited by these times. The month to month rate of change compares the index in the month  $m$  and  $m-1$  of the same year  $y$ . The twelve-month rate of change compares the index in the month  $m$  of the year  $y$  and its corresponding month  $m$  in the year  $y-1$ .

**Reference base:** the year for which the index base is set to 100. The reference base, for a chain index, is the base that allows the comparison of the calculation base indices.

**Weights system:** absolute values or value relatives that allow to calculate the producer price indices. For BiH, the weight source is the annual survey on industry. In particular, the model IND-21 provides SBS information and PRODCOM used to define the nested system of weights. When indices are chained, weights are updated annually.

