



Agency for Statistics of Bosnia and Herzegovina

IPA 2019 Multi-beneficiary statistical cooperation programme

The Service Contract is funded by the European Union, led by Eurostat and implemented by GOPA consortium

**STATISTICAL PROJECT SP 1.3
NATIONAL ACCOUNTS METHODOLOGY**

National Accounts of Bosnia and Herzegovina

Description of Data Sources and Methods

PART B: ANNUAL NATIONAL ACCOUNTS AT PREVIOUS YEAR PRICES

Sarajevo, 2023

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A) GDP BY PRODUCTION APPROACH

CHAPTER 10

GENERAL PROCEDURES

The availability of GDP estimates at constant prices is necessary to provide a measure of the volume of economic activity, eliminating from the current price data the changes in prices from period to period, and thus allowing monitoring economic growth.

Agency for statistics of BiH compiles price and volume measures of gross domestic product (GDP) by the production and the expenditure approach, and of other main national accounts aggregates.

The first steps in establishing a calculating GDP at constant prices began in 2006 with technical support and direct involvement of the IMF consultant to the real sector in Bosnia and Herzegovina. The first calculations were published in 2007 and were related to the calculation of GDP at previous year prices. The base year is the previous year, i.e., all calculations are performed in the prices of previous year. Data in absolute amount and real indices were published at the section level (A21) of Classification of Activities. The publication practice of national accounts data at constant prices follows the publication practice of current price data. Both data sets are published at the same time.

Originally established methods of calculating at constant prices over time are improved depending on available indicators.

The previous year is taken as base year (previous year is also the reference year) for calculation at constant prices. In this way, considering all the structural changes in relative prices that occurred between two successive years.

However, volume values at prices of a previous year allow the comparison of the data only between 2 successive years (data at previous year prices for any given year with the annual current price data of the previous year). In order to obtain long-term series, estimates of volume measures at prices of previous year are chain-linked to produce series at a fixed reference period, thus allowing the comparison between any chosen different periods. Chain-linked volume measures are not additive.

For the calculation of GDP at constant prices the concept of the single indicator is used, due to the lack of adequate deflators of intermediate consumption. Applying a single indicator has implicit the assumption of fixed I/O coefficients base year (previous year). GVA at constant prices is calculated as the difference between output and intermediate consumption at constant prices.

Table 10.1 Gross value added by activities and gross domestic product, at previous year prices, 2015

	Activities	Gross value added 000 KM	Real indices, %
A	Agriculture, forestry and fishing	1 739 702	109.4
B	Mining and quarrying	541 909	100.3
C	Manufacturing	3 060 384	106.7
D	Electricity, gas, steam and air conditioning supply	1 067 391	99.3
E	Water supply; sewerage, waste management and remediation activities	295 679	99.4
F	Construction	1 112 936	103.6
G	Wholesale and retail trade; repair of motor vehicles and motorcycles	3 740 786	103.4
H	Transportation and storage	1 011 527	103.8

I	Accommodation and food service activities	556 956	104.4
J	Information and communication	1 1 209 956	101.4
K	Financial and insurance activities	1 039 371	102.9
L	Real estate activities	1 427 610	101.2
	Of which: imputed rent	1 220 555	99.8
M	Professional, scientific and technical activities	751 383	108.2
N	Administrative and support service activities	219 388	101.2
O	Public administration and defence; compulsory social security	2 422 078	98,7
P	Education	1 306 279	100.4
Q	Human health and social work activities	1 338 554	101.1
R	Arts, entertainment and recreation	298 584	104.6
S	Other service activities	312 275	98.4
T	Activities of households as employers	-	-
U	Activities of extraterritorial organisations and bodies	-	-
	Gross value added (basic prices)	23 544 749	103.8
	Net taxes on product	4 986 045	103.2
	Gross domestic product (GDP) at market prices	28 530 793	103.0

Table 10.2 Gross value added by activities and gross domestic product, chain linked values at prices of 2015

		000 KM			
	Activities	2015	2016	2017	2018
A	Agriculture, forestry and fishing	1 746604	1 881 339	1 730 037	1887 553
B	Mining and quarrying	556 797	576 594	609 251	599 201
C	Manufacturing	3 216 259	3 396171	3 676 884	3 743 203
D	Electricity, gas, steam and air conditioning supply	1 090 618	1 168 723	1 123 132	1 293 964
E	Water supply; sewerage, waste management and remediation activities	301 993	300 670	317 247	326 359
F	Construction	1 119 566	1 148 587	1 193 699	1 227 650
G	Wholesale and retail trade; repair of motor vehicles and motorcycles	3 765 519	3 931 725	4 191 703	4 424 656
H	Transportation and storage	1 014918	1 060 064	1 138 186	1 152 903
I	Accommodation and food service activities	558 546	573 699	631 222	654 147
J	Information and communication	1 294 692	1 291 583	1 306 736	1 354 275
K	Financial and insurance activities	1 048 466	1 107 051	1 189 405	1 250 203
L	Real estate activities	1 435 717	1 440 017	1 452 170	1 446 676
	Of which: imputed rent	1 220 480	1 218 193	1 215 773	1 213 214
M	Professional, scientific and technical activities	782 002	822 446	814 526	864 097
N	Administrative and support service activities	233 152	232 046	247 629	268 017
O	Public administration and defence; compulsory social security	2 441 760	2 404 951	2 423 958	2 434 169
P	Education	1 315 047	1 325 551	1 339 621	1 350 163
Q	Human health and social work activities	1 356 474	1 370 137	1 412 090	1 438 193
R	Arts, entertainment and recreation	316 265	324 406	354 647	383 250
S	Other service activities	327 771	331 822	338 437	357 538
T	Activities of households as employers	-	-	-	-
U	Activities of extraterritorial organisations and bodies	-	-	-	-

Gross value added (basic prices)	23922 168	24 687 583	25 505 784	26 470 624
Net taxes on product	5 006 770	5 179 305	5 329 984	5 546 087
Gross domestic product (GDP) at market prices	28 928 938	29 866 888	30 835 800	32 016 504

Table 10.2 Gross value added by activities and gross domestic product, chain linked values at prices of 2015, continued

	Activities	2019	2020	2021
A	Agriculture, forestry and fishing	1 847 322	1 969 600	1 810 549
B	Mining and quarrying	583 977	570 843	520 773
C	Manufacturing	3 742 588	3 579 470	4 087 767
D	Electricity, gas, steam and air conditioning supply	1 181 661	1 129 842	1 241 689
E	Water supply; sewerage, waste management and remediation activities	331 207	334 095	369 607
F	Construction	1 302 549	1 388 715	1 420 243
G	Wholesale and retail trade; repair of motor vehicles and motorcycles	4 765 297	4 432 486	4 989 556
H	Transportation and storage	1 203 556	1 008 835	1 122 839
I	Accommodation and food service activities	693 779	489 372	584 640
J	Information and communication	1 442 254	1 494 855	1 659 546
K	Financial and insurance activities	1 339 449	1 358 895	1 452 409
L	Real estate activities	1 459 565	1 432 534	1 427 894
	Of which: imputed rent	1 209 686	1 207 039	1 198 542
M	Professional, scientific and technical activities	926 821	913 592	1 006 934
N	Administrative and support service activities	290 337	280 054	327 338
O	Public administration and defence; compulsory social security	2 493 297	2 517 691	2 523 907
P	Education	1 375 140	1 364 340	1 388 417
Q	Human health and social work activities	1 483 602	1 505 844	1 598 812
R	Arts, entertainment and recreation	399 756	358 620	401 036
S	Other service activities	367 579	360 361	366 833
T	Activities of households as employers	-	-	-
U	Activities of extraterritorial organisations and bodies	-	-	-
	Gross value added (basic prices)	27 224 676	26 478 231	28 323 564
	Net taxes on product	5 716 331	5 466 473	5 994 973
	Gross domestic product (GDP) at market prices	32 940 453	31 947 267	34 308 698

Table 10.3 Gross value added by activities and gross domestic product, Deflators

	Activities	2015	2016	2017	2018
A	Agriculture, forestry and fishing	100.4	99.2	100.7	103.0
B	Mining and quarrying	102.7	97.2	101.8	98.8
C	Manufacturing	105.1	105.3	103.2	106.2

D	Electricity, gas, steam and air conditioning supply	102.2	98.5	104.2	108.9
E	Water supply; sewerage, waste management and remediation activities	102.1	101.7	106.0	100.6
F	Construction	99.6	101.8	103.6	103.5
G	Wholesale and retail trade; repair of motor vehicles and motorcycles	100.7	101.1	101.2	101.9
H	Transportation and storage	100.3	99.9	101.9	101.3
I	Accommodation and food service activities	100.3	100.4	102.4	101.1
J	Information and communication	100.3	100.0	100.72	100.1
K	Financial and insurance activities	100.9	99.5	101.4	99.5
L	Real estate activities	100.6	102.2	108.0	104.3
	Of which: imputed rent	99.9	102.2	106.6	104.3
M	Professional, scientific and technical activities	104.1	103.2	101.3	101.4
N	Administrative and support service activities	106.3	106.3	101.7	102.1
O	Public administration and defence; compulsory social security	100.8	100.3	99.2	101.7
P	Education	100.7	99.5	99.5	103.7
Q	Human health and social work activities	101.3	100.0	100.3	106.8
R	Arts, entertainment and recreation	105.9	119.0	107.3	95.0
S	Other service activities	105.0	102.4	100.1	102.1
T	Activities of households as employers	-	-	-	-
U	Activities of extraterritorial organisations and bodies	-	-	-	-
	Gross value added (basic prices)	101.6	101.4	102.1	103.0
	Net taxes on product	100.4	101.2	100.2	101.6
	Gross domestic product (GDP) at market prices	101.4	101.3	101.8	102.8

Table 10.3 Gross value added by activities and gross domestic product, Deflators, continued

	Activities	2019	2020	2021
A	Agriculture, forestry and fishing	102.7	98.8	104.0
B	Mining and quarrying	98.0	104.9	98.7
C	Manufacturing	103.4	102.9	108.8
D	Electricity, gas, steam and air conditioning supply	107.9	97.8	111.8
E	Water supply; sewerage, waste management and remediation activities	102.9	99.7	99.8
F	Construction	104.3	100.0	102.5
G	Wholesale and retail trade; repair of motor vehicles and motorcycles	101.9	99.7	103.0
H	Transportation and storage	100.3	107.1	102.8
I	Accommodation and food service activities	100.8	97.6	106.7
J	Information and communication	100.8	100.6	101.7
K	Financial and insurance activities	95.5	95.1	100.3
L	Real estate activities	101.9	101.2	104.4
	Of which: imputed rent	104.3	99.1	107.1
M	Professional, scientific and technical activities	102.4	101.5	102.5
N	Administrative and support service activities	105.9	103.7	106.7
O	Public administration and defence; compulsory social security	102.4	103.8	102.4
P	Education	105.6	108.8	103.1
Q	Human health and social work activities	104.4	102.8	103.5
R	Arts, entertainment and recreation	102.6	96.9	112.0

S	Other service activities	103.4	100.3	106.1
T	Activities of households as employers	-	-	-
U	Activities of extraterritorial organisations and bodies	-	-	-
	Gross value added (basic prices)	102.6	101.1	104.4
	Net taxes on product	101.9	94.7	107.2
	Gross domestic product (GDP) at market prices	102.5	100.1	104.9

CHAPTER 11

GENERAL INFORMATION ON MAIN SOURCES USED

The main data sources used for the calculation of annual GDP by production approach at constant prices are: Producer price indices (PPI); Consumer price indices (CPI); Volume indices of industrial production (IPI), Indices of number of employed persons.

11.1 The producer price index (PPI)

Producer price index is a short-term statistical indicator that represents the measurement of change of prices of industrial products produced and sold by enterprises on domestic and non-domestic market. This statistical indicator serves as the measure of inflation. It can also serve as the indicator of economic performances. escalator in long-term contracts, deflator for output values, intermediate consumption and capital consumption in National Accounts and as an important tool in creating monetary and fiscal politics.

Producer price index in Bosnia and Herzegovina PPI in Bosnia and Herzegovina is calculated based on the representative list of products and it's producers making a sample of cca.900 producers. Each month 4255 prices are collected directly from producers through the unique questionnaire created in cooperation with Italian experts. PPI in Bosnia and Herzegovina is calculated based on the representative list of products and it's producers making a sample of approximately 570 producers. Each month 4255 prices are collected directly from producers through the unique questionnaire created in cooperation with Italian experts.

The main criterion for selecting the sample of enterprises. products and services that are surveyed was the volume of production and selling on the domestic market got from the Annual survey on Industrial production (IND-21). Entities institutes of statistics have created the sample of enterprises and products and the enterprises itself have chosen the items to be priced.

The price that is to be collected each month on the domestic market represents a price for which producer sells his products to the regular costumers on the domestic market at maximum volume franco loaded into a wagon (truck) at the producer's location. It includes reimbursements if applicable and it excludes commercial rebate, discounts VAT and excises.

The producer price for non-domestic market is a price on a national border- FOB (free on board). Which means that a seller pays the transport to the port deliverance loading costs and a buyer pays costs of transport assurance unloading and transport to its final destination.

This price excludes VAT and similar taxes directly affecting turnover and all taxes and fees on products and services that enterprises pay. The subsidies received are added.

Weights applied for the calculation of producer price index represent the relative share of selected products in the total value of sales of industrial products on the domestic market. Weights are based on the results of the Annual Survey on Industrial production (IND-21) for the year 2015. but for the state level the weights are based on the relative share of each Entity in the total production also from the year 2015. Each year the weights are price updated.

Classification of industrial products is based on the Nomenclature of Industrial Products in BiH 2015 based on the PRODCOM List 2015.

11.2 The consumer price index (CPI)

Consumer Price Index allows to measure the consumer price inflation that is the rate of change of the consumer prices of goods and services purchased by the households through monetary transactions in the economic territory of country for products that directly satisfy consumer's needs.

Consumer Price Index represents a measure of inflation in state. It serves as a guarantee the value of recurrent payments in escalator clauses for contractual relationships, it enables a comparison of inflation in country with inflation in other countries as well as a comparison of price movements within particular country and regions, it can also serve as a base for deflating national accounts data and other purposes.

CPI is calculated on the basis of the representative list of products that was consisted of 619 different items in year 2022. Each month over 21 000 prices are being collected in accordance with defined sample of outlets on 12 geographical locations.

All relevant goods and services bought by the reference population for the purpose of final consumption are included in the index. The coverage of goods and services is reviewed regularly in order to ensure the representativeness of the basket with respect to the consumer tastes and purchasing practices.

All the prices are being collected by the collectors of the statistical institutions in both entities and BHAS. The price collectors receive a clear specifications of the item name, it's COICOP code and unit of measure that they should collect in specific outlet. They choose a concrete item for price collecting in specific outlet, in accordance with the criterion of the most sold products in that outlet.

Weights used for calculating the CPI reflect relative importance of the sampled goods or services in the total consumption of resident households within the domestic territory. They are used for elementary indices calculations as the weighted averages. They are based on the data linked to the Household Final Consumption and resident population. The most important data source for calculation of the weights used in the consumer price indices is the Household Budget Survey. Since January 2019, the compilation of the CPI has been based on the weights derived from household expenditures from the Household Budget Survey 20015, updated every year according to changes in prices in a previous year

The classification of products used in the CPI is the Classification of Individual Consumption by Purpose (COICOP). The COICOP breaks consumer expenditures into twelve different divisions of consumer goods and services

Consumer Price Index calculation begins with the calculation of elementary aggregate indices (items indices) and representative position indices at the level of towns. Elementary aggregate indices are calculated by using Laspeyres-type formula starting from the level of representative indices at the level of entities to the overall index at the level of Bosnia and Herzegovina. Reference base year for index calculation is 2015. For the CPI calculation two different types of weights are used: population weights (horizontal weights) for the level of entities and value of consumption of goods and services of the households on the territory of Bosnia and Herzegovina (vertical weights).

11.3 Volume indices of industrial production

The monthly industrial production index is calculated on the basis of the data collected by the monthly survey of industry (M KPS IND-1) which is carried out in the territory of Bosnia and Herzegovina, on the basis of the Law on statistics of BiH (Official Gazette of Bosnia and Herzegovina No. 26/04 and 42/04), the entity laws on statistics and Annual plans of work of all three institutions in BiH. On the territory of the Federation of Bosnia and Herzegovina information collects and processes the Federal Institute for Statistics of the Federation of Bosnia and Herzegovina and on the territory of the Republic of Srpska by Republic of Srpska Institute for Statistics. Processed Indices are delivered to the Agency for Statistics of Bosnia and Herzegovina which are, together with data for the Brcko District territory, taken into the calculation for the whole territory of Bosnia and Herzegovina.

"Concepts and definitions used in M KPS IND-1 survey are harmonised with the concepts and definitions of the Methodology of short-term business statistics (Theme 4, ISSN 1725-0099, the European Community, 2006.) and Commission Regulation (EC) no 1503/2006. on definitions, variable, variable list and frequency of data collection.

The basic information on BiH industrial production index and short methodology are presented in the publication ""Methodological guidelines for the calculation of the industrial production index in Bosnia and Herzegovina (MD 29)"" , which is available on the website of the Agency for Statistics of BiH: <http://www.bhas.gov.ba> in Industry section."

Monthly survey M KPS IND-1 includes all companies and their parts with 20 and more employed persons who are engaged in one or more industrial activities (Section B, C and D, excluding group D35.3) as defined coverage of activities according to NACE Rev 2.

11.4 Index of number of employed persons

Data on the total number of persons in paid employment in the Federation of BiH (legal persons and crafts and related activities) were obtained by processing data that were taken from the administrative source, the Tax Administration of the Federation of BiH. The data on employed persons in the Republica Srpska are obtained on the basis of the semi-annual statistical surveys of employed persons and employee salaries, as at 31 March and 30 September. The source of data for entrepreneurs and their employees is the Tax Administration of Republica Srpska. The data on employed persons in business entities in the Brčko district BiH are collected by means of a monthly statistical survey of employees and salaries. For public administration, education and health, full coverage applies. For those subjects which are not included in the monthly statistical survey on employees and salaries, the data on employed persons on the monthly basis are imputed once a year from annual statements of accounts. The data on the number of entrepreneurs are estimated on the basis of the administrative register and the data on the number of their employees are taken over from the Health Insurance Fund. Coverage and comparability Annual average of persons in paid employment is calculated on the basis of data by months corrected by the full coverage data with the situation as on 31 March and 30 September.

CHAPTER 12

METHODS USED FOR CALCULATION AT PREVIOUS YEAR PRICES

The single indicators method was used for the GDP calculation at previous years' prices. For the GDP calculation at previous year prices for 2015, the single deflation method or single extrapolation method for output were used, depending on available indicators. Intermediate consumption at previous year prices has been calculated by applying intermediate consumption shares in output for the previous year at current prices to output at previous year prices. The reason for the calculation of intermediate consumption at previous year prices in this way is the unavailability of data on the structure of intermediate consumption at the relevant level of disaggregation. GVA at previous year prices is calculated as the difference between output and intermediate consumption at previous year prices.

The calculation for enterprises, entrepreneurs, individual agriculture, general government activities and NOE are done separately at the level of 2, 3 or 4-digits of Classification of Activities depending on available indicators used in the calculation. Aggregate countrywide estimates of gross domestic product at previous year prices based on the production approach are prepared by the Agency for statistics of BH based on the data compiled separately for the two Entities, Federation of BH and Republika Srpska, and for Brcko District.

12.1 Agriculture, forestry and fishing (A)

For the calculation of output for individual agriculture, the produced quantities from the current year are used at the level of agriculture products and data on average prices of agriculture products from the previous year. Data on produced quantities of crops and livestock products are obtained through regular surveys in agriculture statistics, as well as data on average prices of agriculture products. Output for agriculture enterprises at current prices is deflated with implicit deflator of output for individual agriculture. Intermediate consumption at constant prices has been calculated by applying intermediate consumption share in output for the previous year at current prices to output at constant prices.

For Forestry extrapolation output method with physical volume of forest exploitation volume index of forest assortments is used. Source data is forestry statistics.

For the Fishing deflation output method with Consumer price index (CPI) of fresh fish is used. Intermediate consumption at constant prices has been calculated by applying intermediate consumption share in output for the previous year at current prices to output at constant prices.

12.2 Mining and quarrying (B)

Entity statistical institutions have used different approaches for calculating output at previous year prices: deflation output method with industrial producer price indices on the domestic and on the nondomestic market (PPI of Mining and quarrying) and extrapolation output method with industrial production indices (IPI of Mining and quarrying).

Intermediate consumption at previous year prices has been calculated by applying intermediate consumption share in output for the previous year at current prices to output at constant prices.

12.3 Manufacturing industry (C)

Entity statistical institutions have used different approaches for calculating output at previous year prices: deflation output method with industrial producer price indices on the domestic and on the nondomestic market (PPI of Manufacturing) and extrapolation output method with industrial production indices (IPI for Manufacturing).

Intermediate consumption at constant prices has been calculated by applying intermediate consumption share in output for the previous year at current prices to output at constant prices.

12.4 Electricity, gas, steam and air conditioning supply (D)

Entity statistical institutions have used different approaches for calculating output at constant prices:

- Extrapolation method with volume indices (separately production in hydroelectric power plants and thermal power plants - Electric power generation, transmission and distribution)
- Deflation output method with industrial producer price indices on the domestic and on the nondomestic market (PPI for Manufacture of gas; distribution of gaseous fuels through mains and Steam and air conditioning supply)
- Extrapolation output method with industrial production indices

Output calculation at previous year prices is done at division level (2-digit level). Intermediate consumption at previous year prices has been calculated by applying share of intermediate consumption in output for the previous year at current prices to output at constant prices.

12.5 Water supply; sewerage, waste management and remediation activities (E)

Entity statistical institutions have used different approaches for calculating output at previous year prices:

- Deflation output method with industrial producer price indices for Waste collection, treatment and disposal activities; materials recovery
- Deflation output method with CPI for other activities: Water collection, treatment and supply, sewerage and remediation activities and other waste management services.

And:

- Extrapolation output method with volume indices of water delivered, waste water, waste disposed. The source of data is environment statistics.
- For non-market producers, within general government sector, extrapolation method with index of number of employed persons.

Output calculation at previous year prices is done at division level (2-digit level). Intermediate consumption at previous year prices has been calculated by applying share of intermediate consumption in output for the previous year at current prices to output at previous prices.

12.6 Construction (F)

This activity is, by nature, very special which is visible in usage of different indicators. Since there are no available adequate indices of prices for construction, construction output is deflated with composite index compiled as weighted average of gross wages and prices for main components of building materials.

Entity statistical institutions have used different approaches for calculating intermediate consumption at previous year prices.

- Intermediate consumption at constant prices has been calculated by applying intermediate consumption share in output for the previous year at current prices to output at previous year prices, and
- Deflation of intermediate consumption with PPI of building materials.

12.7 Wholesale and retail trade; motorcycles and personal and household goods (G)

Output at previous year prices is calculated in two phases at the division level of Classification of Activities (2-digit level). In the first phase the revenues from sales of goods are deflated with total CPI. In the next phase, output is extrapolated with real indices of revenues from sales. This approach implies that trade margin rates at previous year prices are fixed.

Intermediate consumption at previous year prices has been calculated by applying intermediate consumption share in output for the previous year at current prices to output at previous year prices.

12.8 Transport and storage (H)

Entity statistical institutions have used different approaches for calculating output at previous year prices.

For Land transport and transport via pipelines calculation is done at the 3-digit level of Classification of Activities by using extrapolation output method with corresponding indices (tonne/km in railway transport, passenger/km in road transport and tonne/km in road transport). For other activities previous year prices estimates are done at the 2-digit level using corresponding CPI.

In the second approach, previous year price estimates are calculated at 2-digit level using deflation output methods. Output is deflated with corresponding CPI (CPI for passenger transport by railway, CPI for road transport, CPI for transport services and CPI for postal services). For non-market producers, within general government sector, extrapolation method with index of number of employed persons is used.

Intermediate consumption at previous year prices has been calculated by applying intermediate consumption share in output for the previous year at current prices to output at previous year prices. For non-market producers, within general government sector, deflation method with total CPI is used.

12.9 Accommodation and food service activities (I)

Calculation output at previous year prices is done at the 2-digit level of Classification of Activities, using deflation output method by CPI for restaurants and hotels, CPI for restaurant services, CPI for accommodation services.

Intermediate consumption at previous year prices has been calculated by applying intermediate consumption share in output for the previous year at current prices to output at previous year prices.

For non-market producers, within general government sector, deflation method with total CPI is used.

12.10 Information and communication (J)

Calculation output at previous year prices is done at the 2-digit level of Classification of Activities, using deflation output method by corresponding CPI. For non-market producers, within general government sector, extrapolation method with index of number of employed persons is used.

Intermediate consumption at previous year prices has been calculated by applying intermediate consumption share in output for the previous year at current prices to output at previous year prices.

For non-market producers, within general government sector, deflation method with total CPI is used.

12.11 Financial and insurance activities (K)

In calculating data at previous year prices for financial intermediation, a difference between two kinds of services is made: financial services that can be directly measured (as fees and commission charges) and financial intermediation services indirectly measured (FISIM). Estimation of financial services that can be directly measured has been made by using deflation by total CPI.

Calculation of FISIM is done in the following way:

- Average value of bank's assets and liabilities (arithmetic mean for opening and closing bank's assets and liabilities) has been deflated by total CPI;
- FISIM on loans and FISIM on deposits at current prices have been extrapolated by volume index of assets and liabilities;
- Estimation of FISIM at previous year prices is obtained as sum FISIM on loans and FISIM on deposits at previous year prices.

Output for insurance services and secondary financial activities at previous year prices has been calculated by deflation with total CPI.

Intermediate consumption at previous year prices has been calculated by applying intermediate consumption share in output for the previous year at current prices to output at previous year prices.

12.12 Real estate activities (L)

Calculation is done at the 2-digit level of Classification of Activities by using the deflation of output method with total CPI.

For calculation output of imputed rent at previous year prices extrapolation method with index of number of population is used.

Intermediate consumption at previous year prices has been calculated by applying intermediate consumption share in output for the previous year at current prices to output at previous year prices.

12.13 Professional, scientific and technical activities (M)

Calculation is done at the 2-digit level of Classification of Activities by using the deflation of output method with total CPI. For non-market producers, within general government sector, extrapolation method with index of number of employed persons is used.

Intermediate consumption at constant prices has been calculated by applying intermediate consumption share in output for the previous year at current prices to output at constant prices. For non-market producers, within general government sector, deflation method with total CPI is used.

12.14 Administrative and support service activities (N)

Calculation is done at the 2-digit level of Classification of Activities by using the deflation of output method with total CPI. For non-market producers, within general government sector, extrapolation method with index of number of employed persons is used.

Intermediate consumption at previous year prices has been calculated by applying intermediate consumption share in output for the previous year at current prices to output at previous year prices. For non-market producers, within general government sector, deflation method with total CPI is used.

12.15 Public administration and defence; compulsory social security (O)

In this activity, there are institutional units that belong only to the general government sector. Constant prices are calculated by cost components at the 2-digit level of Classification of Activities. Output is estimated by using the cost approach as the sum of compensation of employees, intermediate consumption, consumption of fixed capital and other taxes on production. Compensation of employees and other taxes on production are extrapolated with an index of the number of employed persons. For intermediate consumption deflation with total CPI is done. Consumption of fixed capital is calculated using volume index of intermediate consumption and compensations of employees or by deflation with PPI for capital goods.

12.16 Education (P)

For market enterprises, calculation is done at the 3-digit level of Classification of Activities by using deflation output method with CPI for educational services. Intermediate consumption for market enterprises at previous year prices has been calculated by applying intermediate consumption share in output for the previous year at current prices to output at previous year prices.

For institutional units within general government sector, previous year prices are calculated by cost components at the 2-digit level of Classification of Activities. Output is estimated by using the cost approach as a sum of compensation of employees, intermediate consumption, consumption of fixed capital and other taxes on production. Compensation of employees and other taxes on production have been extrapolated with an index of the number of employed persons. For intermediate consumption, deflation with total CPI is done, and consumption of fixed capital has been calculated using volume

index of intermediate consumption and compensation of employees or by deflation with PPI for capital goods.

12.17 Human health and social work activities (Q)

For market enterprises, calculation is done at the 2-digit level of Classification of Activities by using deflation output method with CPI for health services. Intermediate consumption for private enterprises at previous year prices has been calculated by applying intermediate consumption share in output for the previous year at current prices to output at previous year prices. For institutional units within general government sector, the estimates at constant prices are calculated in the same way as for institutional units within general government sector in the activity Education.

12.18 Arts, entertainment and recreation (R)

For market enterprises, calculation is done at the 2-digit level of Classification of Activities by using - extrapolation output method with index of number of employed persons. Intermediate consumption for private enterprises at previous year prices has been calculated by applying intermediate consumption share in output for the previous year at current prices to output at previous year prices.

For institutional units within general government sector, the estimates at previous year prices are calculated in the same way as for institutional units within general government sector in the activities O, P and Q.

12.19 Other service activities (S)

For market enterprises, calculation is done at the 2-digit level of Classification of Activities by using deflation output method with total CPI. Intermediate consumption for private enterprises at previous year prices has been calculated by applying intermediate consumption share in output for the previous year at current prices to output at previous year prices. For institutional units within general government sector, the estimates at previous year prices are calculated in the same way as for institutional units within general government sector in the activities O, P, Q and R.

Table 12.2 Tabular overview of indicators used for calculation of output at constant prices

Activities	Used indicators
A Agriculture, forestry and fishing	Quantities of agricultural products for the current year Prices of agricultural products for the previous year Index of physical volume of forest exploitation CPI of fresh fish
B Mining and quarrying	PPI of Mining and quarrying IPI of Mining and quarrying
C Manufacturing	PPI of Manufacturing IPI of Manufacturing
D Electricity, gas, steam and conditioning supply	PPI of Electricity, gas, steam and conditioning supply; IPI
E Water supply; sewerage, waste management and remediation activities	PPI of Waste collection, treatment and disposal activities; materials recovery Volume index of water delivered, waste water and waste disposed Index of number of employees
F Construction	Composite index (PPI of building material and gross wages) Composite index(CPI of building material and gross wages)
G Wholesale and retail trade; repair of motor vehicles, motorcycles	Real index of revenue from sales of goods, CPI
H Transport and storage	Volume index (tonne/km in railway transport, passenger/km in road transport and tonne/km in road transport)

	CPI for transport by railway, road, air, transport services and postal services Index of number of employed
I Hotels and restaurants	CPI for restaurants and hotels Index of number of students and pupils
J Information and communication	CPI Index of number of employed
K Financial and insurance activities	CPI Index of number of employed Index of earned premium Volume index of assets and liabilities of banks
L Real estate activities	CPI Volume index of population
M Professional, scientific and technical activities	CPI Index of number of employed
N Administrative and support service activities	CPI Index of number of employed
O Public administration and defence; compulsory social security	CPI Index of number of employed
P Education	CPI Index of number of employed
Q Health and social work	CPI Index of number of employed
R Arts, entertainment and recreation	CPI Index of number of employed
S Other service activities	CPI Index of number of employed

12.20 Classification of methods into A, B and C method

The method used for output calculation at constant prices for all activities could be classified as C method, except for Agriculture for which the method could be classified as B method.

The method used for intermediate consumption calculation at constant prices, due to the lack of data on IC structure at relevant level of disaggregation, could be classified as C method.

12.21 Taxes and subsidies on products at constant prices

Calculation taxes and subsidies on product at constant prices is done in the following way:

Federal Office for statistics - Calculation of subsidies and taxes on products at constant prices has not been done separately. Net taxes on products are extrapolated with real growth index of total gross value added. This method is classified as C method.

Institute for Statistics of Republika Srpska - During 2013, with the technical support of the IMF's Advisor in BiH, certain methodological improvements were made in the field of taxes on product at constant prices, in order to obtain the overall growth index of taxes on product.

The calculation of volume indices for each type of tax on product was performed. For the calculation of duties at constant prices, a volume index was calculated using import values, import price indices and average customs duty rate per product group. The duties value from the previous year is extrapolated with the calculated volume index for duties.

For the calculation of the VAT, the volume index was calculated using retail goods data by product groups, consumer price indices and value of services provided to households. VAT from the previous year is extrapolated value with the calculated volume index for VAT.

For the calculation of excises at constant prices the volume index is calculated, for extrapolation of excise value from the previous year. The calculation of volume index is based on the quantities of excise products produced and excise rates. Data on produced quantities of excise products are taken from industry statistics.

The value of the overnight stay tax from the previous year is extrapolated by the index of the number of overnight stays, while for the calculation of the tax on the gambling the index of the volume is calculated using the value of tax on the gambling and deflator of the value of the production of the activity 92 KD BIH 2010.

B) GDP BY THE EXPENDITURE APPROACH

CHAPTER 10

GENERAL PROCEDURES

Agency for statistics B&H compiles GDP by the production and by the expenditure approach at current and constant prices (at previous year prices) as well as the series of chain linked values, with the year 2015 as the reference year and corresponding deflators. GDP by the production approach is the primary approach determining GDP the volume growth of annual GDP.

It should be noted that due to the fact that neither Input/Output framework nor Supply/Use tables has been developed yet, the discrepancy between the two approaches of GDP estimates has not been reconciled. (See Table 1.1, part A)

Although there is a significant discrepancy between two approaches both GDP estimates are published.

GDP by the expenditure approach at constant prices is published on the level of the main expenditure categories. The nominal and real indices for each expenditure categories are published as well.

Household final consumption expenditure data on two digits of COICOP as well as the main categories of Gross fixed capital formation at current and constant prices as well as the series of chain linked values, with 2015 as reference year have been published. The corresponding deflators are available as well.

Table 10.1 GDP by the expenditure approach, nominal and real indices, 2015

Expenditure categories	2015	
	Nominal indices	Real indices
1	2	3
Household final consumption expenditure	101.15	101.75
Final consumption expenditure of NPISH	102.09	103.19
General government final consumption expenditure	101.62	101.16
Individual government consumption	101.36	100.76
Collective government consumption	101.88	101.57
Gross capital formation	101.81	102.97
Gross fixed capital formation	96.42	97.52
Changes in inventories	-	-
Valuables	9.26	9.44
Export of goods and services	109.24	109.78
Goods (fob)	105.10	105.40
Services	120.81	122.03

Import of goods and services (minus)	99.41	101.78
Goods (fob)	97.63	100.09
Service	134.13	134.80
Gross domestic product:	104.94	104.46

Table 10.2 GDP by the expenditure approach at prices of 2015 (chain-linked values), 2015, Mio KM

Expenditure categories							
	2015	2016	2017	2018	2019	2020	2021
1	2	3	4	5	6	7	8
Household final consumption expenditure	22 710	23 202	23 525	24 001	24 542	23 675	24 640
Final consumption expenditure of NPISH	232	244	254	295	316	319	320
General government final consumption expenditure	6 355	6 348	6 436	6 520	6 586	6 687	6 882
Individual government consumption	3 172	3 148	3 171	3 344	3 411	3 445	3 583
Collective government consumption	3 182	3 199	3 264	3 176	3 175	3 242	3 301
Gross capital formation	6 274	7 054	7 856	8 204	8 725	7 983	9 770
Gross fixed capital formation	6 038	6 367	6 867	7 422	7 856	7 524	7 882
Changes in inventories	235	684	985	766	859	394	2 026
Valuables	0	2	0	0	0	0	0
Export of goods and services	10 158	11 109	12 423	13 327	13 394	11 272	14 044
Goods (fob)	7 196	7 906	9 123	9 747	9 539	8 981	10 576
Services	2 962	3 203	3 303	3 583	3 858	2 300	3 471
Import of goods and services (minus)	15 382	16 490	17 752	18 452	18 695	16 185	19 498
Goods (fob)	14 371	15 428	16 597	17 250	17 376	15 250	18 350
Service	1 011	1 062	1 154	1 201	1 321	932	1 145
Gross domestic product:	30 347	31 468	32 738	33 900	34 859	33 711	36 114

Table 10.3 GDP by the expenditure approach, Deflators

Expenditure categories							
	2015	2016	2017	2018	2019	2020	2021

1	2	3	4	5	6	7	8
Household final consumption expenditure	99.42	99.83	101.15	101.50	101.64	99.99	102.47
Final consumption expenditure of NPISH	98.93	98.98	101.08	101.05	100.41	98.85	101.88
General government final consumption expenditure	100.45	99.69	99.95	102.69	102.80	102.45	102.46
Individual govern. consumption	100.59	99.86	99.75	101.27	101.78	102.56	102.22
Collective government consumption	100.31	99.52	100.15	104.18	103.85	102.35	102.71
Gross capital formation	98.87	97.46	102.31	101.28	100.89	98.64	103.65
Gross fixed capital formation	98.87	97.30	103.05	102.25	100.93	98.63	104.02
Changes in inventories	-	-	-	-	-	-	-
Valuables	98.04	-	-	-	-	-	-
Export of goods and services	99.51	97.82	105.53	103.58	100.04	98.45	111.46
Goods (fob)	99.72	97.38	105.13	104.40	99.84	98.32	114.54
Services	99.00	98.91	106.60	101.42	100.54	98.95	102.21
Import of goods and services (minus)	97.67	96.05	105.05	102.90	100.43	98.62	105.15
Goods (fob)	97.54	95.86	105.33	103.00	100.40	98.54	105.30
Service	99.50	98.90	101.11	101.50	100.80	100.02	102.67
Gross domestic product:	100.46	100.53	100.78	101.74	101.68	100.28	104.86

CHAPTER 11

GENERAL INFORMATION ON MAIN SOURCES USED

Estimates of GDP by the expenditure for the year 2015 were calculated at prices of 2014, thus allowing the comparison of data of two consecutive years on a quantitative basis (after eliminating the effect of changes in prices). The implicit deflators of the aggregate and its component are of a Paasche type, which implies that they reflect not only changes in prices but also changes in the composition of the expenditures between the years compared.

Table 11.1 GDP by the expenditure approach at previous year prices, 2015, Mio KM

	2015
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Expenditure categories	Current prices	Structure	At previous year prices	Structure
1	2	3	4	5
Household final consumption expenditure	22 710	74.83	22 843	75.62
Final consumption expenditure of NPISH	232	0.76	234	0.78
General government final consumption expenditure	6 355	20.94	6 327	20.94
Individual government consumption	3 172	10.45	3 154	10.44
Collective government consumption	3 182	10.49	3 173	10.50
Gross capital formation	6 274	20.68	6 345	21.01
Gross fixed capital formation	6 038	19.90	6 107	20.22
Changes in inventories	223	0.78	237	0.79
Valuables	0	0	0	0
Export of goods and services	10 158	33.47	10 208	33.79
Goods (fob)	7 196	23.71	7 216	23.89
Services	2 962	9.76	2 992	9.90
Import of goods and services (minus)	15 383	50.69	15 750	52.14
Goods (fob)	14 371	47.36	14 734	48.77
Services	1 011	3.33	1 016	3.37
Gross domestic product – at market prices	30 347	100.00	30 209	100.00

The most important indicators that have been used for GDP constant price estimates:

- CPI of B&H;
- PPI of B&H
- Export and import unit value indices;
- Construction deflator;
- General government deflator;
- PPI of the most important partner countries.

The detailed description of CPI and PPI is given in Part B 11.2. The description of other indicators is given in the parts that follow.

CHAPTER 12

METHODOLOGY BY PRODUCT

12.1 Estimate of Final consumption expenditure by households at previous year prices

Two methods were applied for the calculation of consumption at constant prices:

- Revaluation of quantities;

- Deflation.

Revaluation of quantities consumed in 2015 using the average prices of 2014 was used for the estimates on consumption of agriculture products, for which data on quantities were available. For all other items, where only values were available, the deflation by the most relevant component of the B&H CPI was used.

Except for agriculture products, the estimates at constant prices were made at the four-digit level of COICOP by matching the estimates with the respective items in the CPI.

Estimate of direct purchases abroad by resident households and direct purchases on the domestic market by non-resident households were calculated at prices of 2014, separately for travel and the other services, by using relevant items of Croatian CPI or Bosnian CPI.

Table 12.1 GDP by the expenditure approach at previous year prices, methods and indicators applied, (000 KM)

Code	COICOP	2015 Current prices	Methods	Indicator	2015 Previous year prices	Real increase
1	2	3	4	5	6	7
01.00	Food and non-alcoholic beverages	7 446 691	Deflation/ revaluation	CPI	7 509 261	101.23
02.00	Alcoholic beverages, tobacco and narcotics	1 752 467	Deflation	CPI	1 639 652	99.79
03.00	Clothing and footwear	1 097 044	Deflation	CPI	1 183 607	111.91
04.00	Housing, water, electricity, gas and other fuels	3 289 267	Deflation	CPI	3 267 118	101.15
05.00	Furnishing, household equipment and routine household maintenance	1 444 293	Deflation	CPI	1 450 105	102.81
06.00	Health	944 421	Deflation	CPI	934 209	102.38
07.00	Transport	2 105 638	Deflation	CPI	2 211 209	101.76
08.00	Communication	699 563	Deflation	CPI	697 855	97.96
09.00	Recreation and culture	1 141 618	Deflation	CPI	1 148 233	100.64
10.00	Education	331 224	Deflation	CPI	324 595	99.43
11.00	Restaurants and hotels	1 694 203	Deflation	CPI	1 689 778	106.76
12.00	Miscellaneous goods and services	1 791 165	Deflation	CPI	1 812 383	104.67
	Net purchases abroad	1 027 319	Deflation	CPI	1 024 116	115.42
Household final consumption expenditure – national concept		22 710 275			22 843 888	101.75

12.2 Estimates of General government consumption expenditure at previous prices

Estimates of general government consumption at constant prices were calculated by applying implicit deflator of general government output taken from the GDP by the production approach at constant prices estimates.

Table 12.2 Estimate of the General government final consumption expenditure at previous year prices, (000 KM)

General government final expenditure	2015 Current prices	Methods	Indicator	2015 Previous year prices	Real increase
1	2	3	4	5	6
General government final consumption expenditure	6 355 632		Implicit deflator of	6 327 185	101.16
Individual government consumption	3 172 717	Deflation	the	3 154 014	100.76
Collective government consumption	3 182 914	Deflation	government output	3 173 171	101.57

12.3 Estimates of Gross fixed capital formation at previous year prices

Estimates of construction assets (buildings and assets) were deflated by the overall implicit deflator of output of the construction industry calculated within the compilation framework of GDP by production.

Estimates of machinery and equipment were calculated at constant prices using the overall weighted producer price index of the main trade partner for capital goods (mostly Germany, Italy and Croatia). The share of machinery and equipment from different countries in total import of machinery and equipment has been used as weight for calculation of composite deflator.

Table 12.3 Estimate of the Gross fixed capital formation at previous year prices, 000 KM

Purpose of investment	2015 Current prices	Methods	Indicator	2015 Previous year prices	Real increase
1	2	3	4	5	6
Machinery and equipment	2 630 946	Deflation	Composite PPI	2 672 172	101.15
Construction	3 113 869	Deflation	Implicit deflator of the construction output	3 138 686	95.01
Other investment	294 090	Deflation	Overall CPI	297 061	93.40
Gross fixed capital formation	6 038 904			6 107 918	97.52

12.4 Change in inventories at constant prices

Changes in inventories at constant prices were calculated using a general price index (CPI), as there is no information on the composition of the inventories and no price indices available to deflate the data if it were available.

12.5 Exports and imports of goods at constant prices

Estimates of exports and imports of goods at constant prices were calculated by deflating with unit value indices. Unit value indices are not price indices since their changes may be due to price and (compositional) quantity changes. However, they are used by many countries as surrogates for price indices. They are used as short-term indicators of inflation transmission, to measure changes in a country's terms of trade (effect), and as deflators of export and import values to yield measures of changes in export and import volumes.

A unit value index of imports of a Paasche type was calculated as a weighted average of the indices calculated at the level of each of the 97 chapters of Combined Nomenclature.

12.6 Exports and imports of services at constant prices

Estimates of imports and exports of services were calculated separately for travel and the other services.

For import of travel services items of the Croatian CPI in was used as representative of the changes faced by Bosnian travellers abroad.

For export of travel services, the Bosnian CPI were taken as representative of the price changes in this item. Until more sophisticated methods are established for the calculation at constant prices of other components of exports and imports of services, the deflators used for exports and imports of goods were applied to the corresponding flows of services.