



TOPICAL RESEARCH AND HIGHLIGHTS

REVISION OF GDP DATA

(PUBLISHED IN 'ECONOMIC REVIEW',
VOL. 3/2022)



BULGARIAN NATIONAL BANK

Revision of GDP Data

In line with its release calendar, the NSI published on 19 October 2022 revised annual and quarterly data on Bulgaria's gross domestic product (GDP) and its components by final consumption expenditure component, production approach and income approach.

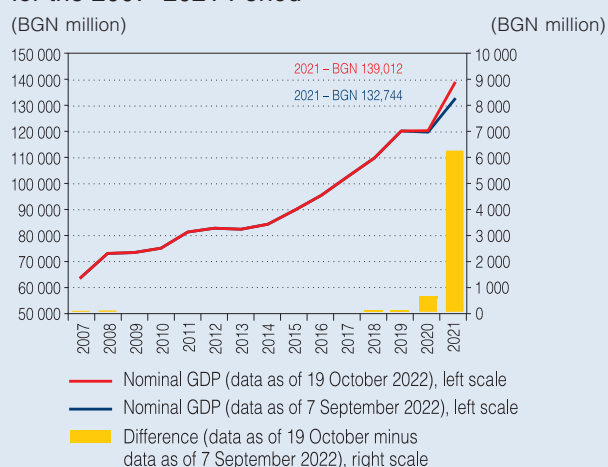
GDP revision according to non-seasonally adjusted data covers the period after the fourth quarter of 2007 and is marked by its substantial size against the backdrop of past revisions. The largest adjustments were made for the period from 2020 to the first half of 2022, with a particularly large scale in 2021 amounting to BGN 6268.0 million (4.7 per cent of unrevised GDP). Quarterly seasonally adjusted GDP data have been revised for the whole period after the first quarter of 1995, which is determined by the statistical methodology used by the NSI for seasonal adjustment. This analysis aims to present GDP data revisions, focusing on the changes in the structure according to the expenditure approach for its calculation and the production approach.

According to the methodology of the national accounts system, there are two main types of data revisions. The first type of revisions are regular, characterised by the availability of new or updated statistical information based on statistical surveys or administrative sources (enterprise accounts, tax information, balance of payments, *etc.*). The second type of revisions is related to a change in the methodology used and calculation procedures for specific statistical indicators. The change in the statistical GDP series, made on 19 October by the NSI, involves mainly the first type of revisions and reflects new, more comprehensive incoming information, according to the NSI.¹

Non-seasonally adjusted data

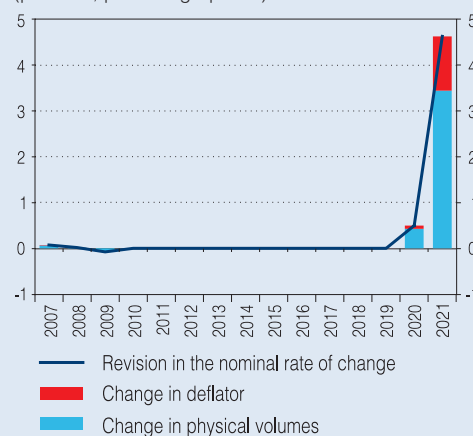
GDP at current prices has been revised positively for individual years since 2007 (see Chart 1). For 2007 and 2008, the annual amount of GDP was increased by BGN 39.6 million and BGN 56.7 million, respectively. Minor revisions were made for 2018 and 2019, with nominal GDP being increased by BGN 0.2 million and BGN 0.8 million, respectively. The most significant revisions were made for 2020 and 2021, amounting to BGN 602.3 million and BGN 6268.0 million, respectively, and covering the majority of GDP components under the different approaches for its calculation. As a result, GDP in 2021 came to BGN 139,012 million at current prices compared to the estimate of BGN 132,744 million before the data revision. The increased nominal value of the indicator is due to a stronger rise in physical volumes and,

Chart 1. Revisions in GDP at Current Prices for the 2007–2021 Period



Sources: the NSI, own calculations.

Chart 2. Revisions in the Rate of Change of Nominal GDP for the 2007–2021 Period



Sources: the NSI, own calculations.

¹ For further information, see the NSI [press release](#) of 21 October 2022.

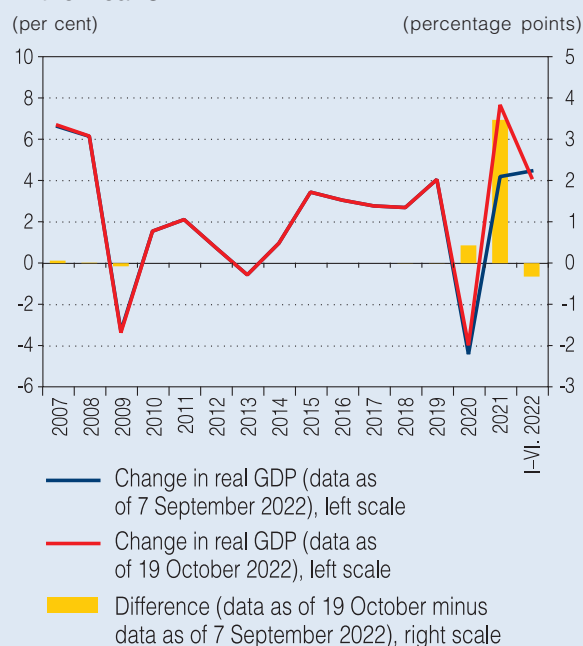
to a lesser extent, an upward revision of the price component (deflator) of GDP (see Chart 2). For the first half of 2022, GDP at current prices was also revised upwards by BGN 1226 million (from BGN 71,769 million to BGN 72,995 million), which is mainly the result of a change in its real component.

Revisions in the levels of GDP at constant prices lead to changes in the annual rate of change of real GDP, but they were relatively small in 2007, 2008 and 2009 and by components of final demand reflected private consumption (see Chart 3). The evolution of economic activity was substantially revised positively for 2020 and 2021, with the published new historical time series showing cumulative real GDP growth of 3.4 per cent over the 2020–2021 period, compared to a decline of 0.4 per cent, according to data published as of 7 September 2022. According to revised data, the decrease in real GDP of Bulgaria amounted to -4.0 per cent in 2020, while previous NSI estimates (dated 7 September) showed a decrease of 4.4 per cent. Real GDP growth in 2021 was revised by 3.5 percentage points to 7.6 per cent (compared to 4.2 per cent growth, according to the old data), which is historically the highest economic growth of Bulgaria with time series available since the beginning of 1995.

By **final consumption expenditure components**, most of the revision of the real rate of change in GDP for 2020 is due to net exports, whose negative contribution to the dynamics of economic activity was reduced from -4.44 percentage points to -4.01 percentage points. This reflects a slower decline in services exports over 2020, according to revised (-27.3 per cent) compared to unrevised (-33.8 per cent) data. At the same time, the revision of goods and services imports partially compensates that of exports, as new data show that in 2020 they decreased to a lesser extent (-4.3 per cent) compared to the previous estimates (-5.4 per cent), mainly due to the dynamics of services imports. Revisions of the contributions of private consumption and changes in inventories were of a similar size but in a different direction (by 0.1 and -0.1 percentage points, respectively), thus neutralising their overall effect on real GDP changes.

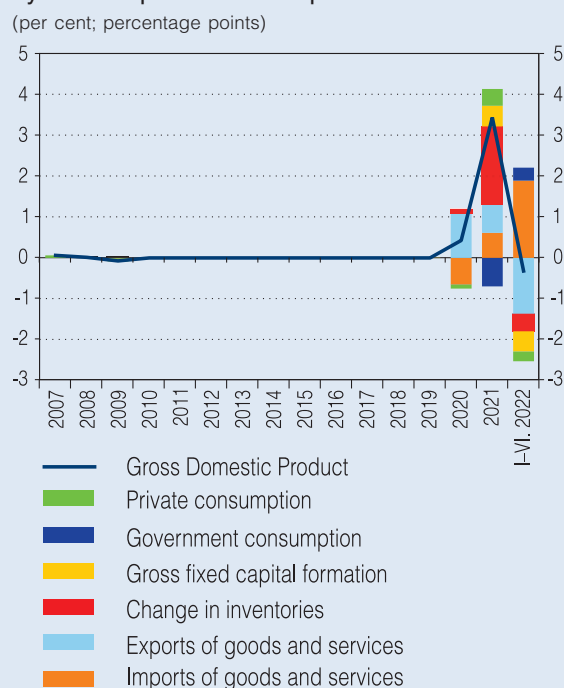
The significant revision towards higher economic growth for 2021 reflects significant changes in all major sub-components of GDP. Reflecting these revisions, changes were made in the interpretation of the factors determining the recovery of economic activity in 2021 after the negative shock from the initial spread of the COVID-19 pandemic. Data published on 19 October 2022 show that firms in Bulgaria maintained higher inventories of commodities,

Chart 3. Revisions in the Annual Rate of Change in the Real GDP



Sources: the NSI, own calculations.

Chart 4. Revisions in the Change in Real GDP by Final Expenditure Components



Sources: the NSI, own calculations.

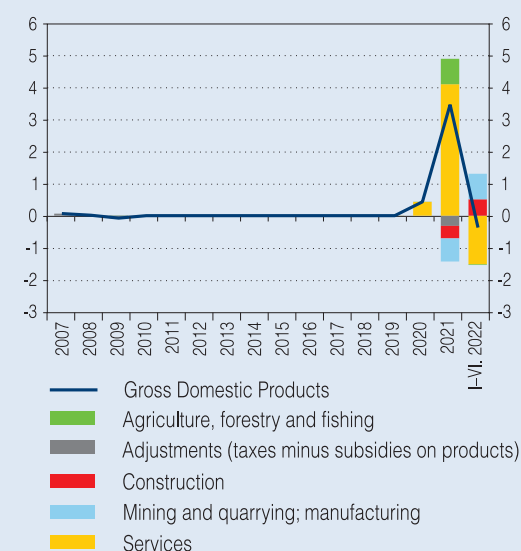
raw materials and finished products in all four quarters of 2021 compared to unrevised data, and the scale of the revision was particularly large for the third quarter. As a result, the contribution of changes in inventories to real GDP growth in 2021 was increased from 1.9 to 3.8 percentage points. The positive contribution of domestic demand in 2021 rose slightly with the revision of 19 October (from 3.4 to 3.6 percentage points), driven by stronger growth in private consumption and a weaker decline in fixed capital investment. At the same time, growth in government consumption for 2021 was revised downwards. According to the published new data, economic activity in 2021 was also supported by the dynamics of net exports, with the contribution of this component to real GDP growth amounting to 0.2 percentage points compared to -1.1 percentage points according to unrevised data. This is due to a revision towards stronger growth in exports of goods and services in combination with a lower increase in imports.

According to the new data, real GDP grew by 4.1 per cent year on year over the first half of 2022, from 4.5 per cent before the revision, reflecting the base effect of the strongly increased GDP estimate in the first half of 2021. By final expenditure component, the downward revision in real GDP growth reflects revisions towards lower growth in private consumption and changes in inventories, as well as a stronger annual decline in fixed capital investment. At the same time, the negative contribution of net exports decreased, and government consumption growth was revised positively.

According to **the production method**, the revision of value added in 2020 shows less pronounced negative effects of COVID-19 on economic activity in the services sector. In particular, the real value added in services went down by 2.6 per cent compared to a decline of 3.3 per cent according to unrevised data. In addition, the services sector in 2021 was still characterised by more positive changes compared to the estimates of 7 September 2022, with value added growth being revised from 2.6 to 9.3 per cent. Agriculture is another sector with a substantial positive revision in real value added growth in 2021 (from 6.1 to 28.8 per cent). At the same time, rates of change in adjustments and value added in industry were revised towards lower growth in 2021. Economic activity dynamics in industry over 2021 was driven by lower value added growth in manufacturing (from 9.4 to 5.4 per cent) in combination with a stronger decline in construction value added (from 7.8 to 17.1 per cent).

Chart 5. Revisions in the Change in Real GDP by Production Approach

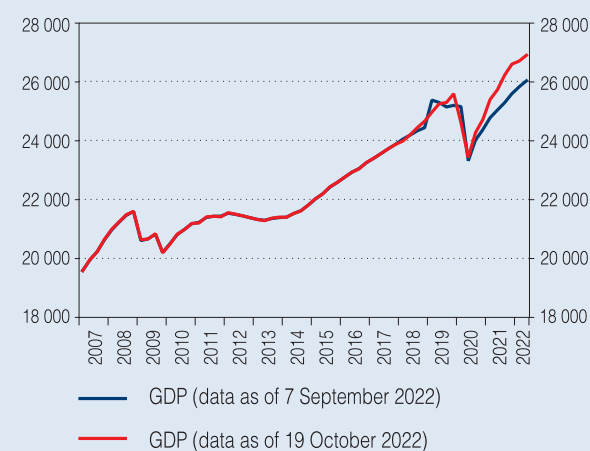
(per cent; percentage points)



Sources: the NSI, own calculations.

Chart 6. Quarterly GDP at Constant Prices, Seasonally Adjusted Data

(BGN million; 2015 prices)



Note: Quarterly data are used. The last observation is for the second quarter of 2022.

Sources: the NSI, own calculations.

Seasonally adjusted data

On 19 October 2022 the NSI published also quarterly seasonally adjusted data on GDP and its components (at current and constant prices). Differences are observed between revised and unrevised seasonally adjusted time series in terms of both their level (due to differences in the levels of non-seasonally adjusted time series), and their dynamics over time. Differences in quarter-on-quarter rates of change are most significant in the period from the first quarter of 2018 to the second quarter of 2022.

According to the revised seasonally adjusted data, immediately before the COVID-19 pandemic, economic activity in Bulgaria has followed a steady upward trend, while unrevised data have shown some decrease in the level of real GDP at the end of 2019 compared to the beginning of the same year. For 2020, new data show that the spread of the COVID-19 in Bulgaria and abroad, as well as containment measures in place since 8 March 2020 contributed to a decline in economic activity on a quarterly basis in two consecutive quarters: down 3.8 per cent in the first quarter and 4.8 per cent in the second quarter of 2020, respectively. These developments were followed by a partial recovery on a quarterly basis of seasonally adjusted real GDP in the third quarter of 2020 (growth of 3.6 per cent). Seasonally adjusted real GDP recovered to the pre-pandemic level in the second quarter of 2021. This economic activity picture differs significantly from the dynamics of unrevised time series, which was marked by a very slight decrease in real GDP over the first quarter of 2020 (down by 0.2 per cent) and a strong quarterly decline in the second quarter (down by 7.3 per cent). At the same time, unrevised data showed a trend towards a more gradual subsequent recovery in economic activity, and pre-pandemic levels were reached in the third quarter of 2021.

Table 1.
Rate of Change of GDP at Constant Prices According to the Revised and Preliminary Annual Data after 2007
(Non-seasonally Adjusted Data)

Annual rate of change	Data as of 19 October 2022															
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	I–VI 2022
GDP at constant prices	6.7	6.1	-3.3	1.5	2.1	0.8	-0.6	1.0	3.4	3.0	2.8	2.7	4.0	-4.0	7.6	4.1
Private consumption	11.5	3.5	-4.3	2.4	2.0	3.7	-3.9	1.4	2.8	2.2	2.5	3.7	6.0	-0.6	8.8	3.8
Government consumption	-1.0	1.9	-5.9	2.1	2.3	-1.8	0.7	-0.1	1.8	2.2	4.3	5.3	2.0	8.3	0.4	9.2
Gross fixed capital formation	13.1	22.0	-17.7	-17.6	-4.4	1.8	0.5	3.5	2.7	-6.6	3.2	5.4	4.5	0.6	-8.3	-9.6
Exports of goods and services	19.6	2.5	-11.7	11.0	12.6	2.0	9.6	3.1	6.4	8.6	5.8	1.7	4.0	-10.4	11.0	6.9
Imports of goods and services	22.6	4.9	-21.5	-0.3	9.6	5.4	4.3	5.1	4.7	5.2	7.4	5.8	5.2	-4.3	10.9	12.3

Contributions

Private consumption	7.7	2.4	-2.8	1.5	1.3	2.3	-2.5	0.9	1.8	1.4	1.5	2.2	3.6	-0.3	5.1	2.3
Government consumption	-0.2	0.3	-1.0	0.4	0.4	-0.3	0.1	0.0	0.3	0.4	0.7	0.8	0.3	1.4	0.1	1.8
Gross fixed capital formation	3.6	6.2	-5.8	-4.9	-1.0	0.4	0.1	0.7	0.6	-1.4	0.6	1.0	0.8	0.1	-1.6	-1.6
Exports, net	-5.3	-2.2	9.4	4.8	1.2	-2.0	3.1	-1.3	1.1	2.3	-0.7	-2.4	-0.7	-4.0	0.2	-3.6

Annual rate of change	Data as of 7 September 2022															
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	I–VI 2022
GDP at constant prices	6.6	6.1	-3.3	1.5	2.1	0.8	-0.6	1.0	3.4	3.0	2.8	2.7	4.0	-4.4	4.2	4.5
Private consumption	11.4	3.5	-4.2	2.4	2.0	3.7	-3.9	1.4	2.8	2.2	2.5	3.7	6.0	-0.4	8.0	4.2
Government consumption	-1.0	1.9	-5.9	2.1	2.3	-1.8	0.7	-0.1	1.8	2.2	4.3	5.3	2.0	8.3	4.0	7.2
Gross fixed capital formation	13.1	22.0	-17.7	-17.6	-4.4	1.8	0.5	3.5	2.7	-6.6	3.2	5.4	4.5	0.6	-11.0	-6.6
Exports of goods and services	19.6	2.5	-11.7	11.0	12.6	2.0	9.6	3.1	6.4	8.6	5.8	1.7	4.0	-12.1	9.9	9.1
Imports of goods and services	22.6	4.9	-21.5	-0.3	9.6	5.4	4.3	5.1	4.7	5.2	7.4	5.8	5.2	-5.4	12.2	15.4

(continued)

(continued)

Contributions

Private consumption	7.6	2.4	-2.7	1.5	1.3	2.3	-2.5	0.9	1.8	1.4	1.5	2.2	3.6	-0.2	4.7	2.5
Government consumption	-0.2	0.3	-1.0	0.4	0.4	-0.3	0.1	0.0	0.3	0.4	0.7	0.8	0.3	1.4	0.8	1.5
Gross fixed capital formation	3.6	6.2	-5.8	-4.9	-1.0	0.4	0.1	0.7	0.6	-1.4	0.6	1.0	0.8	0.1	-2.1	-1.1
Exports, net	-5.3	-2.2	9.4	4.8	1.2	-2.0	3.1	-1.3	1.1	2.3	-0.7	-2.4	-0.7	-4.4	-1.1	-4.1

Annual rate of change	Difference (percentage points)															
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	I-VI 2022
GDP at constant prices	0.1	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	3.5	-0.3
Private consumption	0.1	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.2	0.8	-0.4
Government consumption	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	-3.6	2.0
Gross fixed capital formation	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	2.6	-3.0
Exports of goods and services	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	1.7	1.1	-2.2
Imports of goods and services	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	1.1	-1.2	-3.1

Contributions

Private consumption	0.1	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.4	-0.2
Government consumption	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	-0.7	0.3
Gross fixed capital formation	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	0.5	-0.5
Exports, net	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	0.4	1.3	0.5

Sources: the NSI, own calculations.

Table 2.

Annual Rate of Change of GDP at Constant Prices According to the Revised and Preliminary Quarterly Non-seasonally Adjusted Data

Annual rate of change	Data as of 19 October 2022																	
	2018				2019				2020				2021				2022	
	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II
GDP at constant prices	2.7	2.6	2.9	2.5	5.1	4.3	3.4	3.6	-0.8	-8.9	-2.1	-3.7	3.7	7.1	8.6	10.2	4.4	3.9
Private consumption	6.2	5.2	4.9	-0.4	3.3	6.9	6.4	6.9	0.2	-4.5	3.6	-1.5	6.9	9.2	9.8	8.9	5.5	2.1
Government consumption	3.1	4.7	5.8	7.3	2.6	-1.2	2.1	4.2	6.7	7.7	7.4	10.8	-2.1	-2.2	2.9	2.3	6.6	11.6
Gross fixed capital formation	9.7	5.8	1.9	5.5	2.5	3.2	3.2	8.0	-4.8	-6.6	4.5	6.9	-3.3	-2.0	-11.9	-13.0	-7.4	-11.0
Exports of goods and services	2.0	0.3	-0.8	6.0	5.5	1.2	6.6	2.3	1.9	-16.8	-14.5	-10.3	2.9	23.9	9.6	9.4	4.8	8.9
Imports of goods and services	6.8	7.3	5.2	4.0	4.3	3.3	7.3	5.9	2.2	-14.1	-6.9	1.7	4.9	24.2	13.0	3.9	12.3	12.3

Annual rate of change	Data as of 7 September 2022																	
	2018				2019				2020				2021				2022	
	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II
GDP at constant prices	2.7	2.6	2.9	2.5	5.1	4.3	3.4	3.6	-0.3	-9.7	-2.9	-4.1	0.2	6.5	3.9	5.6	5.0	4.0
Private consumption	6.2	5.2	4.9	-0.4	3.3	6.9	6.4	6.9	0.4	-4.5	4.1	-1.5	5.4	9.3	8.3	8.7	6.4	2.1
Government consumption	3.1	4.7	5.8	7.3	2.6	-1.2	2.1	4.2	6.7	7.7	7.4	10.8	6.2	1.4	6.3	2.7	1.1	13.1
Gross fixed capital formation	9.7	5.8	1.9	5.5	2.5	3.2	3.2	8.0	-4.8	-6.6	4.5	6.9	-6.1	-4.8	-14.4	-15.5	-4.4	-8.1
Exports of goods and services	2.0	0.3	-0.8	6.0	5.5	1.2	6.6	2.3	1.6	-19.2	-16.3	-12.4	-2.0	22.0	7.9	13.8	7.4	10.7
Imports of goods and services	6.8	7.3	5.2	4.0	4.3	3.3	7.3	5.9	1.2	-15.3	-7.6	0.3	4.6	21.8	12.5	10.9	14.1	16.6

Annual rate of change	Difference (percentage points)																	
	2018				2019				2020				2021				2022	
	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II
GDP at constant prices	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.5	0.8	0.9	0.4	3.5	0.6	4.7	4.6	-0.6	-0.1
Private consumption	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.2	0.0	-0.4	0.0	1.5	-0.1	1.5	0.2	-0.8	0.0
Government consumption	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-8.2	-3.6	-3.4	-0.4	5.5	-1.4
Gross fixed capital formation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.8	2.8	2.5	2.5	-3.1	-2.9
Exports of goods and services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	2.5	1.8	2.0	4.9	1.9	1.7	-4.5	-2.6	-1.9
Imports of goods and services	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.2	0.7	1.4	0.3	2.3	0.5	-7.0	-1.8	-4.4

Sources: the NSI, own calculations.

Table 3.
Quarter-on-Quarter Rate of Change of GDP at Constant Prices According to the Revised and Preliminary Quarterly Seasonally Adjusted Data

Quarter-on-quarter rate of change	Data as of 19 October 2022																	
	2018				2019				2020				2021				2022	
	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II
GDP at constant prices	0.5	0.9	1.0	0.9	1.3	1.1	0.2	1.2	-3.8	-4.8	3.6	1.8	2.8	1.3	1.8	1.6	0.5	0.9
Private consumption	0.9	-0.2	0.4	0.0	3.6	2.3	-1.2	2.4	-2.0	-2.8	4.5	-0.2	3.6	1.2	1.8	0.8	1.0	0.9
Government consumption	1.8	2.5	0.4	0.7	-0.8	0.2	2.0	1.3	2.8	2.4	0.7	3.3	0.3	1.5	4.8	0.5	0.1	-0.1
Gross fixed capital formation	2.0	0.6	0.5	0.8	1.9	1.0	-1.2	-0.1	-0.7	1.6	1.4	-0.8	-3.4	-1.5	-4.0	-2.7	-1.7	-2.5
Exports of goods and services	-0.6	1.6	0.8	3.8	-1.7	-1.3	7.0	-1.5	-3.0	-18.4	8.0	5.8	9.3	-1.5	-2.0	3.6	4.1	2.7
Imports of goods and services	1.4	1.3	-1.1	2.4	1.5	0.5	2.8	1.1	-2.3	-15.6	11.4	10.6	0.6	0.4	1.4	1.6	8.1	0.9

Quarter-on-quarter rate of change	Data as of 7 September 2022																	
	2018				2019				2020				2021				2022	
	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II
GDP at constant prices	0.7	0.6	0.6	0.4	3.8	-0.3	-0.6	0.2	-0.2	-7.3	3.0	1.5	1.7	1.0	1.0	1.2	0.9	0.8
Private consumption	0.9	-0.2	0.4	0.0	3.6	2.3	-1.2	2.4	-2.0	-2.8	4.5	-0.2	3.6	2.1	1.8	0.8	1.0	-0.6
Government consumption	1.8	2.5	0.4	0.7	-0.8	0.2	2.0	1.3	2.8	2.4	0.7	3.3	0.3	-2.7	4.8	0.5	0.1	5.5
Gross fixed capital formation	4.8	0.4	-2.1	0.6	4.8	1.0	-2.9	0.9	-1.5	-0.6	5.2	0.4	-9.2	-0.5	-4.6	-1.5	0.9	-2.8
Exports of goods and services	-0.1	1.6	0.7	3.2	-0.9	-1.3	6.9	-2.4	-2.1	-20.5	8.3	4.4	8.6	-1.1	-1.9	7.7	2.0	2.5
Imports of goods and services	-2.0	0.4	-1.2	4.6	-1.1	-1.3	4.8	-0.4	0.4	-13.4	10.0	-2.6	6.2	1.8	-1.9	2.3	3.5	4.7

Quarter-on-quarter rate of change	Difference (percentage points)																	
	2018				2019				2020				2021				2022	
	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II
GDP at constant prices	-0.3	0.3	0.4	0.5	-2.6	1.4	0.8	0.9	-3.6	2.5	0.6	0.4	1.1	0.3	0.8	0.4	-0.4	0.1
Private consumption	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	-0.9	0.0	0.0	0.0	1.5
Government consumption	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	4.2	0.0	0.0	0.0	-5.6
Gross fixed capital formation	-2.8	0.2	2.6	0.3	-2.9	0.0	1.7	-1.1	0.8	2.3	-3.8	-1.2	5.8	-1.0	0.6	-1.1	-2.6	0.2
Exports of goods and services	-0.5	0.0	0.1	0.6	-0.7	0.0	0.1	0.9	-0.8	2.0	-0.2	1.4	0.7	-0.3	-0.1	-4.0	2.1	0.2
Imports of goods and services	3.4	0.9	0.1	-2.2	2.5	1.8	-2.0	1.5	-2.6	-2.1	1.4	13.1	-5.6	-1.4	3.3	-0.7	4.6	-3.8

Sources: the NSI, own calculations.

THE SCULPTURAL COMPOSITION BY KIRIL SHIVAROV DEPICTING HERMES AND DEMETER ON THE SOUTHERN FAÇADE OF THE BULGARIAN NATIONAL BANK BUILDING IS USED IN COVER DESIGN.