Revision of Gross Domestic Product in 2019

On 30 September 2019, Central Statistical Bureau of Latvia released revised national accounts time series from 1995 onwards.

Following revisions have been implemented:

1) results of work on country specific GNI action points in the context of Eurostat's GNI verification cycle;
2) other changes in applied methodology or data sources;
3) annual routine revisions.

Due to all these revisions, annual GDP at current prices changed from -0.9 % to +0.4 % in the period 1995–2017 (see Table 1).

Table 1. GDP at current prices before and after revision in 1995–2017, in million euros

Year	Before revision	After revision	Difference	Difference, in %
1995	4 058.8	4 046.3	-12.5	-0.3
1996	4 678.1	4 664.0	-14.1	-0.3
1997	5 394.1	5 379.9	-14.2	-0.3
1998	6 022.0	5 997.5	-24.4	-0.4
1999	6 272.1	6 259.5	-12.6	-0.2
2000	6 850.3	6 847.2	-3.1	-0.0
2001	7 460.1	7 446.3	-13.9	-0.2
2002	8 397.1	8 382.5	-14.5	-0.2
2003	9 552.7	9 539.0	-13.6	-0.1
2004	11 048.7	11 034.9	-13.8	-0.1
2005	13 597.2	13 586.7	-10.6	-0.1
2006	17 101.9	17 093.7	-8.1	-0.0
2007	22 592.0	22 589.5	-2.5	-0.0
2008	24 351.2	24 393.6	+42.4	+0.2
2009	18 826.6	18 884.9	+58.3	+0.3
2010	17 937.9	17 967.1	+29.3	+0.2
2011	20 302.8	20 319.3	+16.5	+0.1
2012	21 885.6	21 925.2	+39.6	+0.2
2013	22 786.6	22 803.0	+16.4	+0.1
2014	23 618.2	23 654.2	+36.0	+0.2
2015	24 320.3	24 426.0	+105.6	+0.4
2016	25 037.7	25 072.6	+35.0	+0.1
2017	27 033.1	26 797.8	-235.2	-0.9

It should be noted that preliminary data of 2017 were revised using for the estimation annual data sources. All methodological changes described in this paper were taken into account in compilation of GDP for 2017, but as there are no estimates which are based on the previous methods, direct impact

of changes in applied methodology and sources cannot be separately identified. Annual GDP aggregates at current prices were compiled in SUT framework.

The annual real GDP growth changed by -0.8 to +0.3 percentage points (see Chart 1 and Table 2).

Chart 1. Real GDP growth compared to previous year, before and after revision in 1996–2017, in %

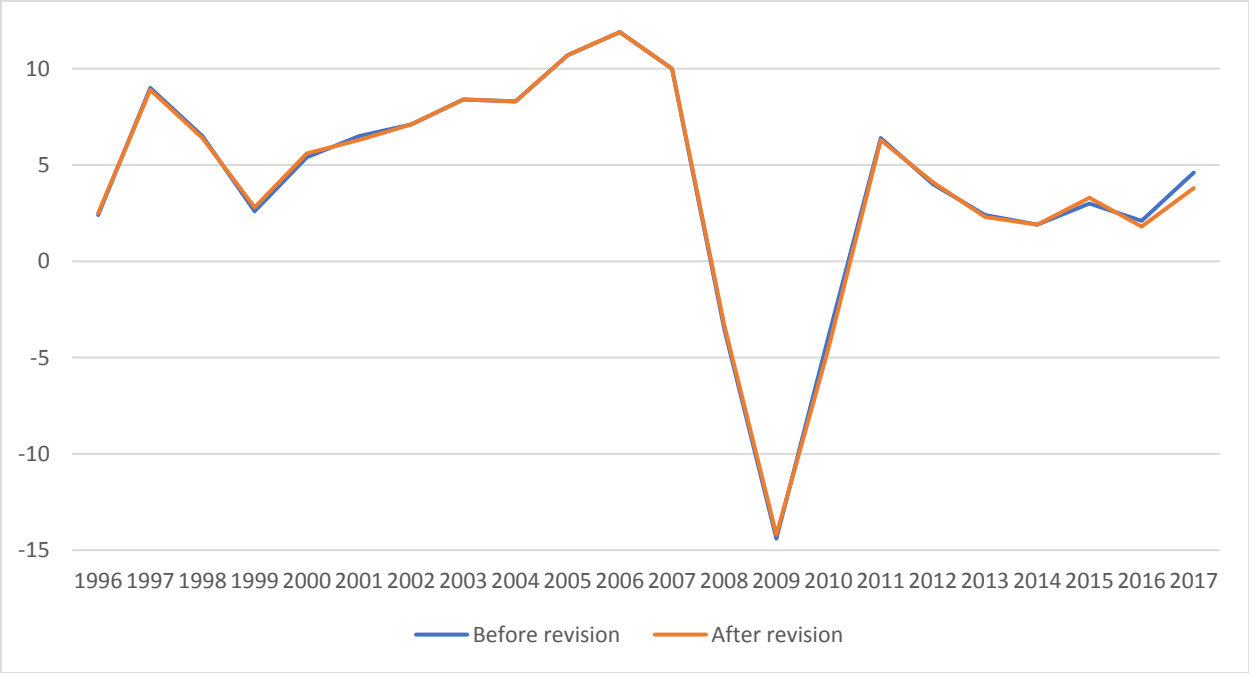

Table 2. Real GDP growth compared to previous year, before and after revision in 1996–2017

Year	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Before revision, in %	+2.4	+9.0	+6.5	+2.6	+5.4	+6.5	+7.1	+8.4	+8.3	+10.7	+11.9
After revision, in %	+2.5	+8.9	+6.4	+2.8	+5.6	+6.3	+7.1	+8.4	+8.3	+10.7	+11.9
Difference, in percentage points	+0.2	-0.0	-0.2	+0.2	+0.2	-0.1	+0.0	+0.0	+0.0	+0.0	-0.0
Year	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Before revision, in %	+10.0	-3.5	-14.4	-3.9	+6.4	+4.0	+2.4	+1.9	+3.0	+2.1	+4.6
After revision, in %	+10.0	-3.3	-14.2	-4.5	+6.3	+4.1	+2.3	+1.9	+3.3	+1.8	+3.8
Difference, in percentage points	+0.0	+0.2	+0.2	-0.5	-0.1	+0.1	-0.1	+0.1	+0.3	-0.3	-0.8

1. Results of work on country specific GNI action points

1.1. The treatment of reinsurance (impact on 2010–2014)

Central Statistical Bureau of Latvia (CSB) investigated reinsurance activity. It was discovered that in Latvia do not exist registered companies in NACE 6520 at all. Few of registered Life and Non-life insurance companies as a secondary activity offer also reinsurance service. Therefore, previously reinsurance activity has been estimated artificially. The Balance of Payments shows also import and export of reinsurance services. It was concluded that figures of the Balance of Payments are more precise and according to ESA 2010 all reinsurance import should be included as intermediate consumption of the insurance holder – Life and Non-life insurance companies. Therefore, reinsurance service import from the Balance of Payments has been included as intermediate consumption of those companies. Reinsurance export is part of output of Life and Non-life insurance companies and should not be divided separately. Impact of these changes on GDP is provided in Table 3.

Table 3. The impact of the changes in the methodology of the reinsurance on GDP at current prices in 2010–2014

Year	Impact on GDP, in million euros	Impact on GDP, in %
2010	-4.3	-0.0
2011	-8.8	-0.0
2012	-10.6	-0.0
2013	-0.6	-0.0
2014	-8.8	-0.0

1.2. Data validation (impact on 2010 only)

This action point embodies the elimination of technical mistakes which were identified during the direct verification of the GNI Information visit. Impact on GDP is provided in Table 4.

Table 4. The impact of the data validation on GDP at current prices in 2010

Year	Impact on GDP, in million euros	Impact on GDP, in %
2010	+42.0	+0.2

1.3. Non-collected VAT due to bankruptcies/insolvencies (impact on 1995–2017)

It was asked to include into the national accounts of Latvia the non-collected VAT due to bankruptcies/insolvencies. CSB received data from the State Revenue Service regarding newly created VAT debt for voluntarily declared liabilities (including non-collected VAT due to bankruptcies/insolvencies) and those figures were included in the output and value added. Impact on GDP is provided in Table 5.

Table 5. The impact of inclusion of the non-collected VAT due to bankruptcies/insolvencies on GDP at current prices in 1995–2016

Year	Impact on GDP, in million euros	Impact on GDP, in %
1995	+5.8	+0.1
1996	+7.1	+0.2
1997	+8.6	+0.2
1998	+10.6	+0.2
1999	+11.3	+0.2
2000	+14.6	+0.2
2001	+15.9	+0.2
2002	+17.9	+0.2
2003	+20.0	+0.2
2004	+24.0	+0.2
2005	+31.5	+0.2
2006	+42.6	+0.2
2007	+53.5	+0.2
2008	+102.1	+0.4
2009	+105.2	+0.6
2010	+74.6	+0.4
2011	+77.0	+0.4
2012	+102.8	+0.5
2013	+85.4	+0.4
2014	+80.2	+0.3
2015	+68.0	+0.3
2016	+66.2	+0.3

1.4. The valuation of changes in inventories (impact on 2010–2016)

Inventories of work-in-progress and finished goods as recorded in business accounting in Latvia do not include a mark-up for net operating surplus (or mixed income) but are valued at the company's production costs. As in CSB the information on basic prices is not available and cost valuation is used, the CSB estimated rate of mark-up to revaluate the inventories from production costs to basic prices. Impact on GDP is provided in Table 6.

Table 6. The impact of the addition of mark-up for changes in inventories on GDP at current prices in 2010–2016

Year	Impact on GDP, in million euros	Impact on GDP, in %
2010	-18.7	-0.1
2011	+25.2	+0.1
2012	+0.8	+0.0
2013	+10.5	+0.0

Year	Impact on GDP, in million euros	Impact on GDP, in %
2014	-14.0	-0.1
2015	+12.3	+0.1
2016	+16.2	+0.1

1.5. Intermediate consumption for the own-account production of agricultural goods (impact on 1995–2016)

Own-account production of agricultural goods by non-agricultural households has been recorded on gross base, however, in order to ensure comparability with other countries and taking into account that production process always creates necessity for some inputs, it was necessary to calculate the intermediate consumption of own-account production of agricultural goods by non-agricultural households. Impact on GDP is provided in Table 7.

Table 7. The impact of the intermediate consumption for the own-account production of agricultural goods on GDP at current prices in 1995–2016

Year	Impact on GDP, in million euros	Impact on GDP, in %
1995	-14.9	-0.4
1996	-17.5	-0.4
1997	-18.7	-0.3
1998	-19.3	-0.3
1999	-19.6	-0.3
2000	-19.4	-0.3
2001	-21.6	-0.3
2002	-23.5	-0.3
2003	-25.8	-0.3
2004	-29.1	-0.3
2005	-32.5	-0.2
2006	-39.0	-0.2
2007	-50.4	-0.2
2008	-57.2	-0.2
2009	-49.5	-0.3
2010	-50.1	-0.3
2011	-54.8	-0.3
2012	-52.9	-0.2
2013	-62.8	-0.3
2014	-44.9	-0.2
2015	-41.9	-0.2
2016	-46.5	-0.2

1.6. Research & development (impact on 1995–2016)

Methodology for the estimation of R&D was revised and improved. Impact on GDP is provided in Table 8.

Table 8. The impact of the changes in the methodology of the R&D on GDP at current prices in 1995–2016

Year	Impact on GDP, in million euros	Impact on GDP, in %
1995	-1.6	-0.0
1996	-2.6	-0.1
1997	-3.7	-0.1
1998	-4.9	-0.1
1999	-5.9	-0.1
2000	-7.5	-0.1
2001	-9.3	-0.1
2002	-10.7	-0.1
2003	-9.6	-0.1
2004	-9.9	-0.1
2005	-10.8	-0.1
2006	-11.7	-0.1
2007	-11.6	-0.1
2008	-12.7	-0.1
2009	-11.0	-0.1
2010	-17.5	-0.1
2011	-25.0	-0.1
2012	-17.9	-0.1
2013	-25.9	-0.1
2014	-9.3	-0.0
2015	-10.1	-0.0
2016	-12.1	-0.0

2. Other changes in applied methodology or data sources

2.1. PIM application (impact on 1995–2016)

Up till now the calculation of consumption of fixed capital in Latvia was done in MS Excel. It consisted from numerous tables by each institutional sector and kind of assets, by different service lives. The calculation was made by total of asset, and afterwards there were split by activities taking into account structure of Gross fixed capital formation. In 2019 PIM application for calculation of CFC was created. In this application the PIM is applied directly for each NACE activity. The differences in results between CFC estimates received from aggregate calculations in MS Excel and new results from NIM application are caused by more detailed calculation by activities. Also, some

errors were discovered, taking into account the complex calculation process in MS Excel, and excluded. Impact on GDP is provided in Table 9.

Table 9. The impact of PIM application on GDP at current prices in 1995–2016

Year	Impact on GDP, in million euros	Impact on GDP, in %
1995	-1.9	-0.0
1996	-1.2	-0.0
1997	-0.4	-0.0
1998	-10.8	-0.2
1999	+1.6	+0.0
2000	+9.3	+0.1
2001	+1.1	+0.0
2002	+1.8	+0.0
2003	+1.8	+0.0
2004	+1.1	+0.0
2005	+1.2	+0.0
2006	+0.0	+0.0
2007	+6.0	+0.0
2008	+10.3	+0.0
2009	+13.6	+0.1
2010	+3.4	+0.0
2011	+2.9	+0.0
2012	+21.0	+0.1
2013	+9.4	+0.0
2014	+18.4	+0.1
2015	+49.9	+0.2
2016	+11.2	+0.0

2.2. Branches of the insurance companies (impact on 2012–2015)

When CSB worked on GNI action point on reinsurance detailed investigation of Life and Non-life insurance companies was performed. It was found out that the reports which have been received from Financial and Capital Market Commission do not include foreign branches operating in Latvia, but data regarding branches of the Latvian insurance companies operating abroad were included. Therefore, necessary actions were taken to exclude those inconsistencies. Impact on GDP is provided in Table 10.

Table 10. The impact of the branches of the insurance companies on GDP at current prices in 2012–2015

Year	Impact on GDP, in million euros	Impact on GDP, in %
2012	-3.7	-0.0
2013	+7.4	+0.0
2014	+14.4	+0.1
2015	+27.4	+0.1

3. Annual routine revisions

In addition to above mentioned reasons for data revisions there were also minor annual routine revisions. Impact on GDP is provided in Table 11.

Table 11. The impact of the annual routine revisions on GDP at current prices in 2009–2011 and 2013–2015

Year	Impact on GDP, in million euros	Impact on GDP, in %
2009	-0.0	-0.0
2010	+0.0	+0.0
2011	+0.0	+0.0
2013	-6.9	-0.0
2014	+0.0	+0.0
2015	+0.0	+0.0

4. New reference year

In addition to the above-mentioned revisions, the reference year for the GDP calculated with the chain-linking method was transferred from 2010 to 2015.

5. Change of quarterly benchmarking method

The benchmarking method for the quarterly national accounts has been changed from the pro-rata to the Denton-Cholette method. The direct benchmarking is applied for components at the most detailed level necessary to produce. All aggregates are benchmarked indirectly by the aggregation of the benchmarked components. Indirect benchmarking of aggregates allows to preserve the consistency (additivity) between components and all aggregates. The Denton-Cholette method has been implemented using the R package tempdisagg "Methods for Temporal Disaggregation and Interpolation of Time Series" developed by Christoph Sax, Peter Steiner, and Tommaso Di Fonzo (https://cran.r-project.org/package=tempdisagg).