

Revision of the gross domestic product (GDP) in 2014

Pursuant to the Regulation (EU) No 549/2013 of the European Parliament and of the Council of 21 May 2013, all European Union (EU) Member States are obligated to adopt a new methodology in national accounts time series starting September 2014. The previous methodology, European System of National and Regional Accounts 1995 (ESA 95) will be replaced by the new methodology ESA 2010.

On 8 September 2014, Statistics Estonia released national accounts time series from 2000 onwards, with the following revisions made in the time series:

- As part of the regular revision, the annual and quarterly GDP data for 2010 were revised according to the supply and use tables; and the GDP data for 2012 were revised according to the Structural Business Survey (SBS, or EKOMAR in Estonian). As a result of these revisions, the GDP for 2010 increased by 0.8 percentage points and the GDP for 2012 by 0.6 percentage points. The revisions based on the above-mentioned data sources were the reason for the review of the 2011 and 2013 calculations as well. The chained values of the GDP for these years changed by -0.1% and $+1.9\%$, respectively. As 2013 is the base year for the calculation of the 2014 accounts, the accounts for the 1st quarter of 2014 released in June this year were also revised.
- The national accounts time series based on the previous methodology (ESA 95) were improved according to the reservations submitted by Eurostat. These changes increased the Estonian GDP by up to 0.1% in the period 2000–2010.
- The GDP time series were recalculated according to ESA 2010 rules. The Estonian GDP in 2010 increased approximately 1.3% due to methodological differences.
- The results of the 2011 Population and Housing Census were also taken into account. As a result, the population number used in national accounts changed. Indicators regarding dwellings and the labour market estimates associated with the GDP were recalculated as well.
- In the calculation of the consumption of fixed capital, the linear method was replaced with the geometric method.
- The reference year was shifted from 2005 to 2010 when chain-linking the GDP figures.
- The data sources for the calculation of financial intermediation services indirectly measured (FISIM) were clarified and the calculations were improved.
- The calculation of net taxes on products was improved.

Ensuing from all these revisions, the annual GDP at current prices changed by -0.2% to 2.3% in the period 2000–2013 (Table 1).

Table 1. GDP at current prices, before and after revision, 2000–2013

	Before revision, million euros	After revision, million euros	Difference, %
2000	6 159.8	6 170.5	0.2
2001	6 970.9	6 963.4	-0.1
2002	7 776.3	7 759.5	-0.2
2003	8 718.9	8 698.5	-0.2
2004	9 685.3	9 706.4	0.2
2005	11 181.7	11 260.2	0.7
2006	13 390.8	13 517.9	0.9
2007	16 069.4	16 241.1	1.1
2008	16 235.1	16 510.6	1.7
2009	13 969.7	14 137.8	1.2
2010	14 371.1	14 707.1	2.3
2011	16 216.4	16 403.8	1.2
2012	17 415.1	17 636.7	1.3
2013	18 434.7	18 738.8	1.6

During the same period, the real growth of the annual GDP changed by -1.1 to 0.1 percentage points, and the real growth of the quarterly GDP changed by -1.5 to 0.9 percentage points (Figure 1 and Table 2).

Figure 1. GDP real growth compared to the corresponding period of the previous year, before and after revision, 2001–2013**Table 2. Revised GDP real growth (compared to the same quarter of the previous year) and difference from the previously published growth rate, 1st quarter 2010 – 1st quarter 2014**

	2010		2011		2012		2013		2014	
	growth, %	differ- ence, pp	growth, %	differ- ence, pp	growth, %	differ- ence, pp	growth, %	differ- ence, pp	growth, %	differ- ence, pp
1st quarter	-3.3	-0.2	9.0	-1.2	5.8	-0.3	3.9	-0.4	0.3	0.5
2nd quarter	1.8	-1.1	8.1	-0.5	5.2	0.5	0.8	-0.6	..	..
3rd quarter	5.0	-1.1	9.9	-0.2	4.0	0.9	0.3	-1.5	..	..
4th quarter	6.3	-1.1	6.2	0.2	3.8	-0.6	1.7	0.1	..	..
Annual	2.5	-0.8	8.3	-0.4	4.7	0.1	1.6	-0.6	..	..

Below is a closer look at the methodological changes.

Regular revision of national accounts time series

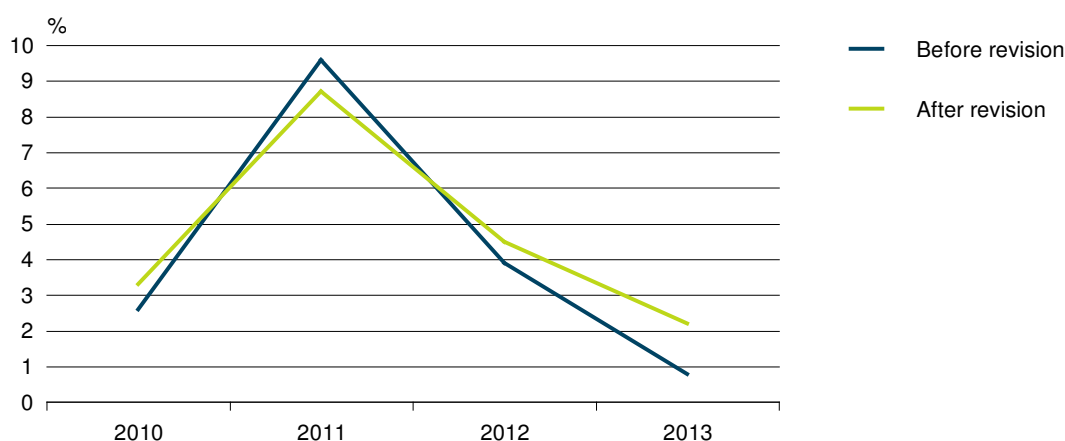
Ensuing from the regular revision made in 2014, the annual GDP at current prices changed by –0.1% to 1.1% in the period 2010–2013.

The real growth of the annual GDP in the same period changed by –0.9 to 0.8 percentage points and the real growth of the quarterly GDP changed by –3.1 to 2.2 percentage points (Figure 2 and Table 3).

Table 3. Revised GDP real growth (compared to the same quarter of the previous year) and difference from the previously published growth rate, 1st quarter 2010 – 1st quarter 2014

	2010		2011		2012		2013		2014	
	growth, %	differ-ence, pp	growth, %	differ-ence, pp	growth, %	differ-ence, pp	growth, %	differ-ence, pp	growth, %	differ-ence, pp
1st quarter	–3.2	0.4	10.3	–1.4	6.1	1.1	4.2	2.9	–0.1	1.2
2nd quarter	2.8	1.5	8.7	–3.0	4.6	2.1	1.4	0.4	..	..
3rd quarter	6.1	0.4	10.1	0.0	3.0	–0.4	1.9	1.2	..	..
4th quarter	7.3	0.7	6.0	0.7	4.4	–0.5	1.6	1.3	..	..
Annual	3.3	0.8	8.7	–0.9	4.5	0.6	2.2	1.4	..	..

Figure 2. GDP real growth compared to the corresponding period of the previous year, before and after regular revision, 2010–2013



As a result of the regular revision, the total value added in 2010 increased 1.3% compared to the previously published estimate. The biggest changes occurred in the value added of accommodation and food service activities, and transportation and storage (9.9% and 7.8%, respectively). Domestic demand increased 1.8%. In 2012 the change in total value added at current prices was 0.3%, while domestic demand rose 0.6%. The growth was the biggest in the value added of transportation and storage, and financial and insurance activities. At the same time, the value added in real estate activities and in energy decreased.

Reservations

The EU budget is financed from national GNI-based own resources. Therefore, the task of Eurostat is to monitor that the Member States' contributions to the EU budget would be correctly calculated on the basis of the GNI (gross national income). If there are shortcomings in a Member State's methodology for calculating the GNI, Eurostat submits a reservation and requires the improvement of the methodology. By September 2014, all EU Member States who had been subject to such reservations had to make changes in their ESA 95 time series according to the reservations.

By 8 September 2014, Statistics Estonia had to make the following changes in the time series (2000–2014) of Estonian national accounts calculated according to the ESA 95 methodology:

- improve the calculations of the consumption of fixed capital on roads and bridges by separating roads and bridges from other structures;
- improve the accounts of entertainment, literary and artistic originals and add them to national accounts estimates;
- record the vehicle registration tax according to ESA 95 as a tax on products, regardless of who pays the tax. So far, the registration tax for goods vehicles had been recorded as market output.

As a result, there were changes in the estimates for non-financial corporations and the government, as well as in gross fixed capital formation and net product taxes. The changes were small; in the period 2000–2009 the GDP increased by 0.01% to 0.1% (Table 4).

Table 4. Impact of reservations on GDP, %

	Originals	Fixed capital on roads, bridges	Vehicle registration tax	Total
2000	0.16	–0.05	0.01	0.12
2001	0.10	–0.06	0.01	0.05
2002	0.09	–0.06	0.01	0.04
2003	0.11	–0.06	0.01	0.06
2004	0.13	–0.07	0.01	0.07
2005	0.12	–0.07	0.01	0.07
2006	0.10	–0.07	0.01	0.04
2007	0.08	–0.08	0.01	0.01
2008	0.11	–0.09	0.01	0.03
2009	0.13	–0.10	0.00	0.03
2010	0.10	–0.10	0.01	0.00

It is difficult to distinguish the impact of these changes on the GDP in later years.

I. Methodological changes in ESA 2010

The methodological change which had the biggest impact on the increase in the GDP level was the recognition of research and development (R&D) as investment.

- Capitalised research and development
ESA 2010 recognises expenditures on R&D as fixed investments; ESA 95 recognised such expenditures as intermediate consumption. As a result of this change, the GDP increased by 0.9% in 2010.
- Non-life insurance and reinsurance
According to ESA 2010, adjusted claims are used for the calculation of non-life insurance and reinsurance output.
As a result of this change, the GDP and the GNI can either increase or decrease. In 2010 the output of non-life insurance and reinsurance decreased by 19.0 million euros due to this change, while in 2013 it increased by 0.9 million euros.
- Military expenditures
According to ESA 2010 all military expenditures (except ammunition, rockets and bombs treated as military inventories) are treated as gross fixed capital formation. In 2010 the consumption of fixed capital rose by 52.7 million euros and the GDP increased by 0.4% due to this change.

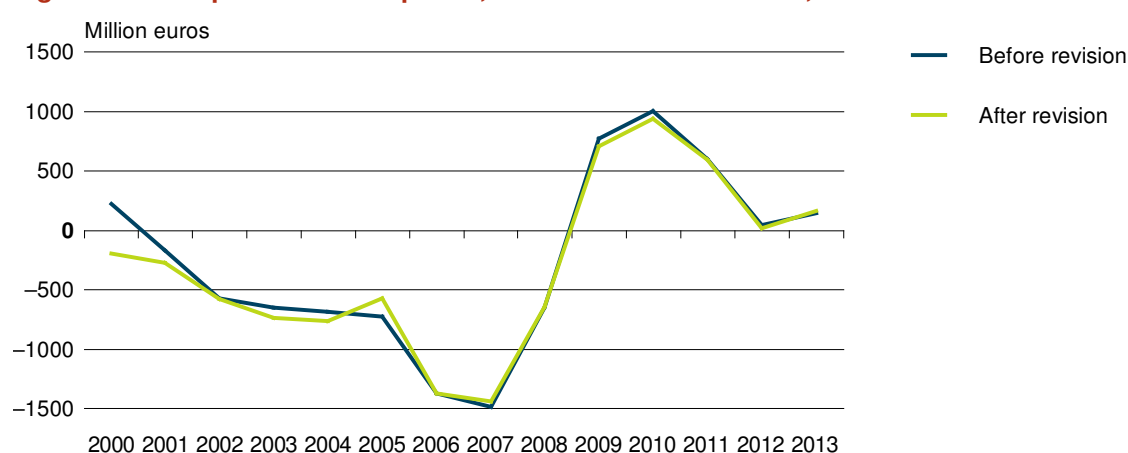
- Goods sent abroad for processing and merchanting of goods

Under ESA 95, when goods were sent abroad for processing, they were initially recorded as exports upon being sent abroad and as imports upon returning. Under ESA 2010, no movement of goods is recorded as a result of such transactions (unless the owner of the goods changes as part of the transaction). Instead, the increase in the value of the goods following processing is recorded as an import of the processing service in the country where the goods were initially sent from and as an export of the service in the country where the goods were processed.

According to ESA 2010, goods under merchanting are no longer recorded as merchanting services. Instead, a net export of goods under merchanting is shown in the accounts of the merchant economy.

As a result of these changes, exports and imports of both goods and services changed, while the change in net export (i.e. the difference between exports and imports) remained between –103.6 million euros in 2001 and +151.8 million euros in 2005. Among other reasons, the change in net export may be a result of both the difference in time between when the goods were sent abroad and when they were processed, as well as the difference between the declared value of the goods and the fee actually paid for the processing service.

Figure 3. Net export at current prices, before and after revision, 2000–2013



- Government, public and private sector classification

ESA 2010 gives more guidelines for the delineation of the government, public and private sectors. Therefore, public sector units were reallocated between the sectors. Since the output of the units of the government sector and NPISHs are derived from costs, the total value added of the whole economy changed and so did the GDP. The changes in the structure of public sector units in 2012 are outlined in Table 5.

Table 5. Public sector units, 2012

Sector	Sector name	ESA 95	ESA 2010	Difference
S.11	Public-sector non-financial enterprises	325	316	-9
S.12	Public-sector financial enterprises	9	9	0
S.13	Government sector	301	318	17
S.15	NPISH	19	11	-8
Total		654	654	0

- FISIM between resident and non-resident financial institutions

According to ESA 2010, there is no more calculation and allocation of FISIM export and FISIM import between resident and non-resident financial intermediaries. In 2010 FISIM export decreased by approximately 3.8 million euros, meaning that the output of FISIM decreased by the same amount. At the same time, FISIM import decreased by approximately 6.4 million euros, meaning that the intermediate consumption of FISIM also decreased by that amount.

- Allocation of the output of the central bank

Under ESA 95, the output of financial intermediation services provided by central banks had to be fully assigned to the intermediate consumption of other financial intermediaries. According to ESA 2010, the central bank output is divided into two and only the non-market output of the central bank is recognised as the intermediate consumption of other financial institutions. As a result of this change, the central bank output increased by 3.3 million euros in 2010.

- Valuation of output for own final use for market producers

Output for own final use has to be valued at the basic prices of similar products sold on the market. In cases where these are not available, the output for own final use should be valued at production costs. To these costs, ESA 2010 adds mark-up for net operating surplus or mixed income. In Estonia's national accounts, the only change for market producers occurred in the calculations for software that enterprises have developed for own use. There are no changes for non-market producers. In 2010, the value of software developed for own final use increased by 4.6 million euros due to this change.

Results of the 2011 Population and Housing Census

In 2011 there was a population and housing census (PHC) in Estonia. As of 8 September 2014, the results of the 2011 census replaced the census data from 2000 which had been used so far. Estonia's population number was specified on the basis of the 2011 census and the indicators regarding dwellings were recalculated. The labour market estimates associated with the GDP were also recalculated.

In particular, among GDP estimates, household final consumption expenditure was affected by the change of the population number. In 2010 the decrease in household final consumption expenditure was approximately 0.1%.

The changes resulting from the revised population number are more noticeable in case of GDP per capita (Table 6).

Table 6. GDP per capita, 2000–2013

	GDP per capita			Population		
	before revision, euros	after revision, euros	difference, %	before revision	after revision	difference, %
2000	4 498	4 417	-1.8	1 369 515	1 396 985	2.0
2001	5 110	5 016	-1.8	1 364 101	1 388 115	1.8
2002	5 724	5 626	-1.7	1 358 644	1 379 350	1.5
2003	6 441	6 346	-1.5	1 353 557	1 370 720	1.3
2004	7 178	7 124	-0.8	1 349 290	1 362 550	1.0
2005	8 307	8 311	0.1	1 346 097	1 354 775	0.6
2006	9 967	10 037	0.7	1 343 547	1 346 810	0.2
2007	11 977	12 114	1.1	1 341 672	1 340 680	-0.1
2008	12 110	12 348	2.0	1 340 675	1 337 090	-0.3
2009	10 423	10 594	1.6	1 340 271	1 334 515	-0.4
2010	10 723	11 046	3.0	1 340 160	1 331 475	-0.6
2011	12 102	12 357	2.1	1 339 928	1 327 439	-0.9
2012	13 007	13 334	2.5	1 338 932	1 322 696	-1.2
2013	13 784	14 218	3.1	1 337 381	1 317 997	-1.4

The output of dwelling services includes services produced by rented dwellings (actual rent) and services produced by owner-occupied dwellings (imputed rent). In Estonia, the user-cost method is used for calculations of imputed rents.

An analysis of the results of PHC 2011 showed that, due to the different questionnaire used in PHC 2000, dwellings let to relatives or friends for free (zero rentals) had been erroneously classified under actual rent. Therefore, the entire time series of dwelling services was adjusted, including the year 2000. As a result of the new calculations, the output of actual rent decreased, while the output of imputed rentals increased. In addition to the renewed housing structure, the values of different rent prices (for actual rent) were clarified.

The revision of dwelling services influenced the calculations of household final consumption expenditure and the value added of the household sector. Also, the estimates for non-financial enterprises and the general government sector changed.

Table 7. Output of dwelling services at current prices, before and after revision, 2000–2013

	Before revision, million euros	After revision, million euros	Difference, %
2000	632.9	591.7	-6.5
2001	692.7	623.8	-9.9
2002	713.9	654.7	-8.3
2003	737.1	686.7	-6.8
2004	787.5	747.9	-5.0
2005	864.4	822.2	-4.9
2006	1 016.0	990.0	-2.6
2007	1 202.6	1 162.2	-3.4
2008	1 214.4	1 174.9	-3.2
2009	1 096.6	1 066.5	-2.7
2010	1 058.4	1 032.7	-2.4
2011	1 117.8	1 109.1	-0.8
2012	1 190.0	1 152.8	-3.1
2013	1 288.9	1 234.7	-4.2

Consumption of fixed capital

The consumption of fixed capital was calculated on the basis of the linear method, but the methodological analysis revealed that this is not always justified. For assets that do not have a long lifespan (e.g. machinery and equipment), it is more appropriate to use the geometric method of calculating depreciation. In case of this method, the depreciation rate is applied to the net capital stock. Hence, together with ESA 2010 changes, the geometric method was introduced in the calculation of the consumption of fixed capital.

Additionally, the changes affect the estimates of capital formation for the years 2000–2009 because of the added costs associated with the transfer of ownership of land. These costs were added to buildings and structures.

Table 8. Consumption of fixed capital at current prices, before and after revision, 2000–2013

	Before revision, million euros	After revision, million euros	Difference, %
2000	724.1	768.8	6.2
2001	845.4	833.4	-1.4
2002	943.0	943.6	0.1
2003	1 051.9	1 086.3	3.3
2004	1 196.5	1 257.6	5.1
2005	1 374.5	1 428.6	3.9
2006	1 631.5	1 707.3	4.6
2007	1 930.5	2 058.5	6.6
2008	2 119.4	2 277.3	7.4
2009	2 198.9	2 383.0	8.4
2010	2 257.3	2 391.1	5.9
2011	2 354.5	2 464.4	4.7
2012	2 559.9	2 633.5	2.9
2013	2 770.4	2.901.2	4.7

The revised consumption of fixed capital also includes all the changes arising from ESA 2010.

Transfer of reference year

In addition to the above-mentioned revisions, the reference year for the GDP calculated with the chain-linking method was transferred from 2005 to 2010. The transition to the new reference year changed the chain-linked indices and the chain-linked values, but the GDP and the growth of its components remained the same as in case of the previous reference year (2005).

The transfer of the reference year was mainly required due to the non-additivity of components which is characteristic of the chain-linking method – it means that the sum of single chain-linked absolute values does not equal the aggregate. Additivity is possible only in the reference year and in the following year. The farther from the reference year, the greater the non-additivity. The reason for this is that chain-linked values are found by separately chain-linking the aggregate as well as each component.

Clarification of FISIM calculations

When the methodological changes of ESA 2010 were implemented in FISIM calculations, the data and indicators used in the calculations were examined. As a result of this analysis, more precise administrative data from the Commercial Register were taken into use and the calculations were simplified. Table 9 outlines the FISIM output before and after revision. The FISIM estimates after revision include the changes due to the ESA 2010 methodology.

Table 9. FISIM output at current prices, before and after revision, 2000–2013

	Before revision, million euros	After revision, million euros	Difference, %
2000	152.8	144.2	−6.0
2001	188.0	170.8	−10.1
2002	223.8	188.4	−18.8
2003	215.0	175.0	−22.9
2004	218.7	185.9	−17.6
2005	228.1	218.3	−4.5
2006	327.3	302.1	−8.3
2007	440.3	454.8	3.2
2008	449.3	538.2	16.5
2009	343.2	351.6	2.4
2010	352.5	383.8	8.2
2011	409.4	430.1	4.8
2012	374.8	397.0	5.6
2013	372.9	386.9	3.6

Clarification of calculations of net taxes on products

The methods for the calculation of taxes in general government finance statistics and in GDP accounts were harmonised during the revision of the time series. The time-adjusted cash method, which was used in financial statistics, was introduced in the national accounts time series as well. So far, the declared tax method had been used for the calculation of taxes at current prices. This change affects the years 2000–2007, as a common methodology was used from 2008 onwards.

In addition, the deflation of value added tax was analysed. As a result, it was decided to change the extrapolation with the value added of the previous period (the method used so far). The new index is calculated using the weighted average value added tax rate and the consumer price index. The above-mentioned methodological corrections caused changes in the time series of net product taxes both at current and constant prices.

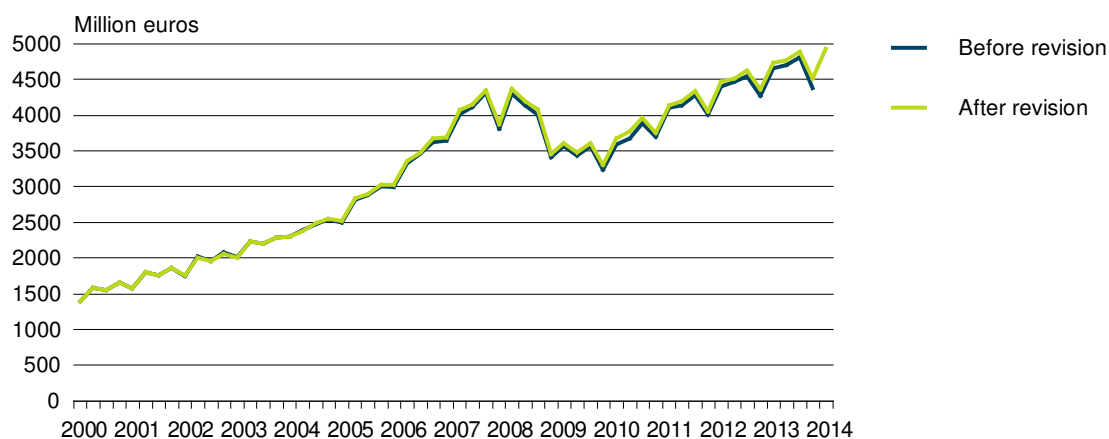
Other corrections

During the revision of the time series, the deflation of the GDP transactions on product basis was also analysed, including the indices used for goods and services. Some indices were replaced.

In addition to the above-mentioned revisions, the calculation of the output and intermediate consumption of investment funds was changed. As a result, the levels of these transactions in the financial sector changed, but there was no impact on the value added and GDP of the sector.

All the above-mentioned changes at current prices are shown in Figure 4.

Figure 4. GDP at current prices, before and after revisions, 1st quarter 2000 – 2nd quarter 2014



[More information](#) about the transition to ESA 2010.

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