EUROPEAN
COMMISSION

Brussels, 7.3.2018
SWD(2018) 205 final

COMMISSION STAFF WORKING DOCUMENT

Country Report Estonia 2018

Accompanying the document

COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN CENTRAL BANK AND THE EUROGROUP

2018 European Semester: Assessment of progress on structural reforms, prevention and correction of macroeconomic imbalances, and results of in-depth reviews under Regulation (EU) No 1176/2011

{COM(2018) 120 final}

CONTENTS

Executive summary 1

1. Economic situation and outlook 3

2. Progress with country-specific recommendations 8

3. Reform priorities 11

3.1. Public finances and taxation 11
3.2. Financial sector 14
3.3. Labour market, education and social policies 17
3.4. Investment 27
3.5. Sectoral policies 33

Annex A: Overview Table 38

Annex B: Macroeconomic Imbalance Procedure Scoreboard 41

Annex C: Standard Tables 42

References 48

LIST OF TABLES

Table 1.1: Key economic, financial and social indicators — Estonia 7
Table 2.1: CSR progress — Estonia 9
Table 3.2.1: Financial soundness of banks 14
Table B.1: The MIP scoreboard for Estonia (AMR 2018) 41
Table C.1: Financial market indicators 42
Table C.2: Headline Social Scoreboard indicators 43
Table C.3: Labour market and education indicators 44
Table C.4: Social inclusion and health indicators 45
Table C.5: Product market performance and policy indicators 46
Table C.6: Green growth 47

LIST OF GRAPHS

Graph 1.1: Real GDP and growth contributions 3
Graph 1.2: Quarterly harmonised index of consumer prices (HICP) inflation (y-o-y % change) 3

Graph 1.3: Real effective exchange rate 4
Graph 1.4: Breakdown of external position (current and capital accounts) 4
Graph 1.5: Export market share, goods and services, nominal 5
Graph 1.6: Net lending/borrowing by sector 5
Graph 1.7: Employment by sector 6
Graph 2.1: Overall multiannual implementation of 2011-2017 CSRs to date 8
Graph 3.2.1: Credit growth 14
Graph 3.2.2: Business financing sources 15
Graph 3.2.3: Wage growth in construction vs total economy 16
Graph 3.3.1: Key labour market indicators 17
Graph 3.3.2: Impact of work ability reform on unemployment (by disability class) 19
Graph 3.3.3: Gender pay gap in unadjusted form 20
Graph 3.3.4: Corrective power of taxation and social transfers, 2016 21
Table 1: QUEST simulation results 22
Graph 3.4.1: Breakdown of the gap with the Euro Area 27
Graph 3.4.2: Breakdown of absolute growth in Estonia, 2005-2016 27
Graph 3.4.3: Foreign direct investment, sum of net inflows (% of GDP) 28
Graph 3.4.4: Investment rates (total) 28
Graph 3.4.5: Investment rates (public and private) 28
Graph 3.4.6: Investment in intellectual property products 29
Graph 3.4.7: Resolving insolvency indicators 31
Graph 3.4.8: Nominal wage growth in Estonia in comparison with wage benchmarks 32
Graph 3.5.1: Highly-cited publications(*) 34
Graph 3.5.2: R&D expenditure and sector of performance and source of funds (2015) 34
Graph 3.5.3: Wholesale electricity prices 37
Graph 3.5.4: Market concentration index for power generation 37

LIST OF BOXES

Box 2.1: Tangible results delivered through EU support to structural change in Estonia 10
Box 3.3.1: Monitoring performance in light of the European Pillar of Social Rights 18
Box 3.3.2: Personal Income Tax reform in Estonia 22
Box 3.4.1: Investment challenges and reforms in Estonia 30
Box 3.5.1: Policy highlights: e-governance 36

EXECUTIVE SUMMARY

Estonia's strong economic growth and high employment offer a window of opportunity to pursue key reforms. Effective policies to address the risks associated with demographic decline and bottlenecks in Estonia's social protection system, as well as in research and innovation, would enable better use of resources, including of human capital thereby raising the country's growth potential.([1])

An improving external outlook and a recovery in investment boosted Estonia's real GDP growth to above 4 % in 2017. Real GDP growth is forecast to settle at around 3 % in 2018-2019 once the initial boost from the investment recovery passes. Exports and private consumption are expected to continue adding strongly to growth, although inflation and a tight labour market could weigh on their development. Estonia has loosened its fiscal policy, as new expenditure plans are not fully covered by revenue increases. In structural terms the deficit is expected to significantly increase to about 1.5 % of GDP in 2018 and 2019.

Estonia's labour market has performed well, and employment and labour market participation have been high, but a falling labour supply imposes challenges. Backed by a favourable economic environment, unemployment has declined since 2010 and is currently among the lowest in the EU (6.8 % in 2016 and 6% in 2017). However, unemployment is expected to increase moderately in the coming years as the 'Work Ability' reform activates people with reduced ability for work who might not become employed immediately. In the medium term, the working-age population is projected to shrink considerably. As a result, the pressure on the cost of labour is expected to rise. Some challenges also arise from skills shortages.

The poverty risk among the older people has increased, largely because pensions have not kept pace with economic growth. Pension adequacy is likely to become a bigger problem due to rising dependency ratios. Long-term care needs and costs are fuelled by the rapid ageing of the population.

Productivity growth in Estonia has picked up recently, but not to the extent seen before the crisis. Labour productivity growth has halved compared to pre-crisis growth rates and lags behind the wage growth. The gap between labour productivity and wages narrowed in the first half of 2017 as the growth in productivity became faster and exceeded that in real wages for the first time in several years. At the same time, the overall slowdown in investment rates to the EU average levels suggests that the fast catching up phase may be over. Going forward, the challenge will be to use the scarce resources more productively to maintain the country's growth model. However, weak performance in innovation and low private research and development investment give rise to concerns about the economy's ability to expand the proportion of knowledge-intensive activities.

Estonia has made some progress in addressing the 2017 country-specific recommendations. There has been some progress with making the social safety net more adequate and some progress reducing the gender pay gap, but more time is needed to see the impact of taken measures. Estonia has made some progress in promoting private investment in research and development, and in stepping up cooperation between academia and business.

Regarding its national targets under the Europe 2020 strategy, Estonia met its employment rate target of 76% and also its tertiary education target already in 2015. It is also performing well on renewable energy, energy efficiency and reducing greenhouse gas emissions. However, there is underperformance on reducing early school leaving, and on meeting the national targets for reducing poverty and R&D expenditure.

Estonia performs relatively well on a number of the indicators of the Social Scoreboard supporting the European Pillar of Social Rights, while challenges remain. Estonia's labour market is performing well notwithstanding that the coverage of unemployed people by active labour market policies appears to be low. A high level of unmet need for medical care is reported. Social protection and inclusion is undermined by the

([1]) This report assesses Estonia's economy in the light of the European Commission's Annual Growth Survey published on 22 November 2017. In the survey, the Commission calls on EU Member States to implement structural reforms to make the European economy more productive, resilient and inclusive. In so doing, Member States should focus their efforts on the three elements of the virtuous triangle of economic policy — boosting investment, pursuing structural reforms and ensuring responsible fiscal policies.

relatively low effectiveness of social transfers in reducing poverty. This has implications also for income inequality, which remains relatively high, despite recent improvements.

The main findings of the analysis contained in this report, and the related policy challenges, are as follows:

- **Providing a more adequate social safety net supported by better service provision remains a major challenge for Estonia.** Tax-cutting measures are creating employment incentives for the low income earners but will not significantly alleviate the inequality. Steps are being taken to provide more adequate pensions, subsistence allowances, and higher family allowances, yet an increasing share of the population is at risk-of-poverty. The areas with the most inadequate financing are pensions, disability benefits and long-term care services. The ongoing administrative reform could improve the delivery of high-quality services.

- **Estonia faces challenges in relation to occupational health and access to healthcare.** The state of health of the working population suggests that working conditions do not entirely enable people to lead longer healthy working lives. Access to healthcare due to waiting times for specialised medical care remains a challenge. Measures are being taken and reforms are considered to improve the situation; however, their impact will require time to materialise.

- **The gender pay gap remains one of the highest in the EU despite some measures.** The parental leave and benefits system will be made more flexible and will provide one month of leave exclusively for fathers. This is expected to shorten women's long career breaks that contribute to the gender pay gap. The planned legislation to improve wage transparency would only apply to public sector entities. These measures appear to be steps into the right direction but their effectiveness remains to be seen.

- **Estonia is generally performing well on education and training, but a number of challenges remain.** Students possess a good level of basic skills and tertiary educational attainment is above the EU average. But the early school leaving rate remains high. Drop-out among first-year students of upper secondary vocational education and training is particularly high. Although participation in adult learning is rapidly increasing, it is rather limited among the low-skilled. The appeal of and interest in obtaining a PhD degree is rather limited but this may change as PhD allowances have been increased. Measures are underway to address the high drop-out rates in higher education.

- **In order to sustain growth without losing competitiveness, Estonia's challenge is to have a sufficient productivity growth.** In the medium term, convergence of domestic wages with those of higher-wage countries together with falling labour supply appears to be the main drivers of wage growth. While the risks of competitiveness losses have been contained so far, the lack of effective measures to increase labour productivity puts at risk the prospect of further income convergence towards the EU average.

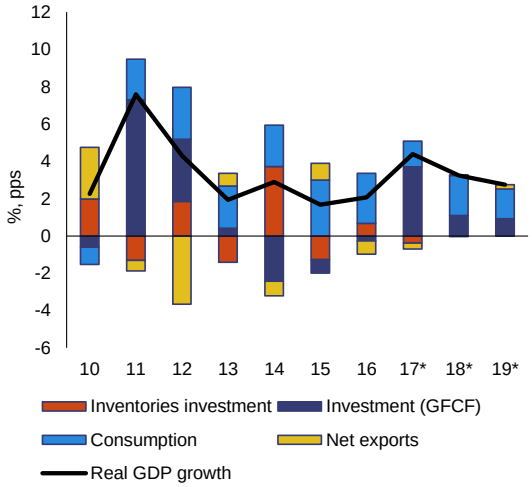
- **Estonia's weak productivity growth can be linked to its moderate performance on R&D and innovation.** While the economy has some high value-added and knowledge-intensive activities, private R&D intensity, science-business links, and innovation and technological capacity of companies remain low, weakening Estonia's productivity. Public sector expenditure on R&D has been traditionally above the EU average, however insufficient prioritisation of public R&D remains a challenge. Broader focus on the role of the human capital and skills in fostering innovation can be key to expanding Estonia's growth capacity since other enabling framework conditions, including business environment and e-government perform well. However, lengthy and inefficient insolvency procedures remain an obstacle to investment.

1. ECONOMIC SITUATION AND OUTLOOK

GDP growth

Estonia's economic growth in 2017 is expected to have surged to over 4 % (Graph 1.1**).** Domestic demand was the main growth driver, with investment's contribution to growth particularly strong, which was due largely to a significant pick-up in EU-funded investments from a low point in 2016. In addition, strong external demand supported a broad-based rise in exports and industrial production.

Graph 1.1: **Real GDP and growth contributions**



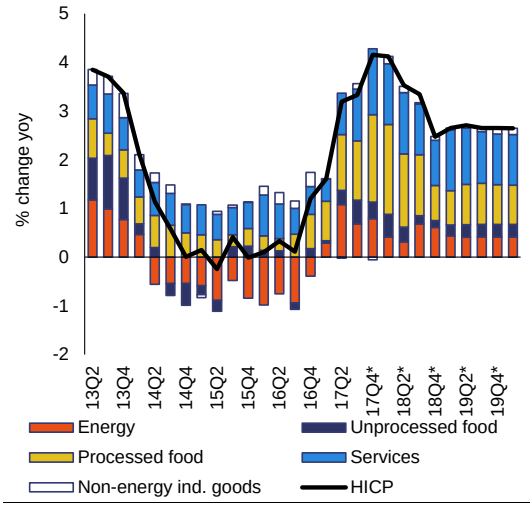
Forecasts for 2017-2019 are based on the assumption of no change in policy
Source: European Commission

Estonia's real GDP growth is forecast to slow to around 3 % in 2018 and 2019, as the boost from EU funded investments levels off. Domestic demand is projected to remain the growth driver during this period. In 2018, both household consumption and investment are set to increase swiftly (see Boxes 3.3.2 and 3.4.1).

Inflation

Driven by excise hikes and a rise in global prices for food and energy, inflation peaked at 3.7 % in 2017, above the euro area average. Inflation is forecast to slow in 2018 and 2019 to around 3 % (see Graph 1.2) as global commodity prices stabilise and the rises of the excise taxes are smaller in those years.

Graph 1.2: **Quarterly harmonised index of consumer prices (HICP) inflation (y-o-y % change)**



* based on ECFIN Autumn Forecast 2017
Source: European Commission

Financial sector

The banking sector is robust, supported by a strengthened prudential framework. Profitability of banks remains relatively high and non-performing loans are limited. Lending growth to corporations has expanded moderately since 2012 and picked up to about 5 % year-on-year in the first half of 2017. Lending to households has also picked up steadily since 2012 on the back of mortgage loans. In the first half of 2017, loans to households and loans for housing both grew by more than 6 % year-on-year.

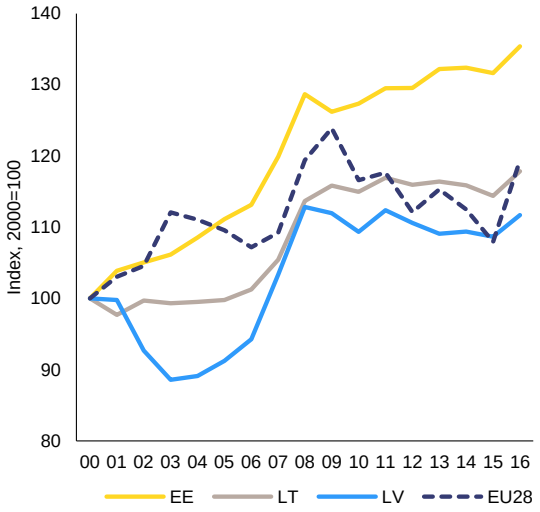
Cost competitiveness

Estonia is a small open economy, making it dependent on external demand and its own competitiveness. On average, foreign trade accounts for 80 % of GDP in Estonia, almost double the 42 % average for the EU-28.

Estonia's cost competitiveness compared to the EU has been continuously declining. The favourable economic outlook combined with the tightening of the labour market have put constant pressure on the compensation per employee, which has, since 2012, significantly outpaced productivity growth. This has, in turn, resulted in rising unit labour costs and an appreciation in the real effective exchange rate compared to the EU

and the other Baltic States (see Graph 1.3). In the first half of 2017, labour productivity increased faster than real labour costs for the first time after several years, responding to a recovery in external demand. Real unit labour costs went down by 2.1% in the first quarter of 2017, and by 0.8% in the second quarter. Also, the inflow of foreign direct investment has moderated since 2010 and has fallen recently, in contrast to developments in the EU overall.

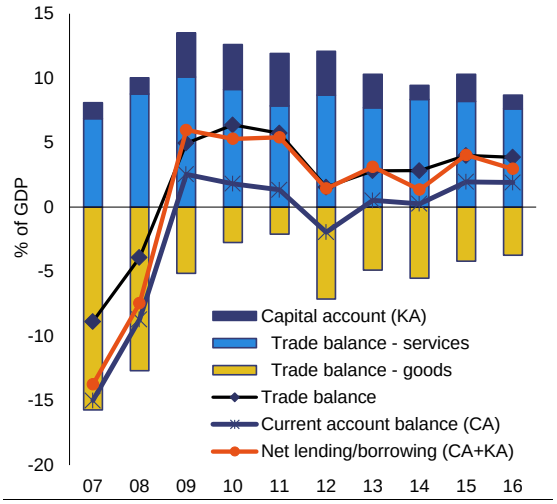
Graph 1.3: **Real effective exchange rate**



Source: European Commission

In spite of the continued loss in cost competitiveness, Estonia's current account balance remains in surplus. According to the European Commission's autumn 2017 forecast, the current account is projected to show a surplus of around 2 % of GDP over 2018-2019. This will mainly come from exports of services, which have grown faster over recent years than exports of goods. The trade balance for goods has been in deficit every year over recent decades. Reflecting the current account surplus, Estonia's net international investment position has become significantly less negative than during the 2008 boom years (see Table 1.1).

Graph 1.4: **Breakdown of external position (current and capital accounts)**

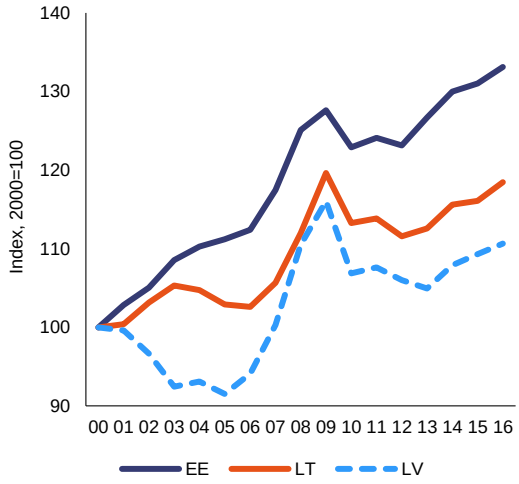


Source: European Commission

The continued current account surplus suggests that part of the loss in cost competitiveness has been compensated by improvements in non-cost competitiveness (see Section 3). Estonia's export market share increased in 2000s, and quickly recovered after the financial crisis. The country performs well on microeconomic factors that also influence competitiveness, such as the business environment and labour market flexibility ([2]), as well as on access to finance.

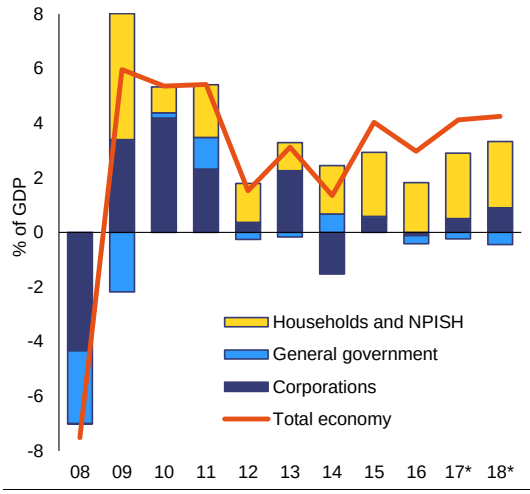
([2]) See Country Report 2017.

Graph 1.5: **Export market share, goods and services, nominal**



Source: MIP Scoreboard

Graph 1.6: **Net lending/borrowing by sector**



NIPSH stands for non-profit institutions serving households
Source: European Commission

Public finance

The budget is expected to remain in a small nominal deficit in 2017-2019, despite robust economic growth. According to the Commission's autumn 2017 forecast, in structural terms the deficit is estimated to be more significant, at around 1.5 % of GDP over the same period. In 2018, several new tax measures are due to take effect, most notably a lowering of personal income taxes, which are offset by excise hikes (on alcohol, tobacco and fuels) and corporate income tax reform. On the expenditure side, an investment programme of 0.4 % of GDP over 2018-2020 will begin, as will several new spending programmes in healthcare, education and social funding. Public debt is expected to remain very low and stable at around 9 % of GDP.

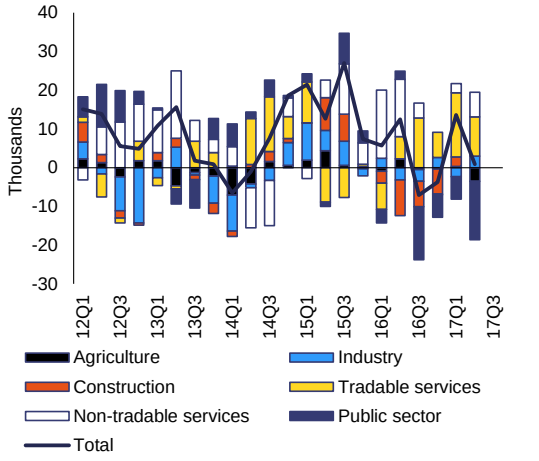
Labour market

Estonia's good labour market performance masks the challenge of its shrinking working-age population (see Section 3.4.1). Over the last years, the dynamism of wages and the large supply of job offers, together with reforms to social insurance, such as a rise in the pension age and the Work Ability reform, have led to an increase in labour market participation. At 76.6 % in 2016, the employment rate (for 20-64-year-olds) exceeded the Europe 2020 and national targets. In 2017, employment picked up in all sectors except in agriculture and the public sector (Graph 1.7). The latter has been affected by government downsizing plans designed to bring employment in public administration in line with demographic trends. Unemployment has been falling since 2010 and is currently among the lowest in the EU. According to demographic projections, the working-age population will continue to decline in the coming years.

Wages are growing fast on the back of buoyant economic growth and a shrinking labour supply. In 2016, average monthly gross wages and salaries stood at EUR 1 146, an increase of 7.6 % from 2015. This is the largest annual change since 2008. In the first half of 2017, wage growth slowed somewhat to 6.2%. Wage growth is partly linked to the increasingly tightening of the labour market. According to survey-based data (European Commission, 2017), in Estonia a higher share of companies report that the shortage of labour is a major factor constraining their business than in other EU Member States. This share has been increasing since 2009. Labour shortages have been identified in many sectors, e.g. in science, technology and engineering, in managerial positions, and in legal and healthcare professions (OECD, 2017) ([3]). According to survey data, unmet demand for labour is particularly high in the ICT sector, despite an increase in the number of students and graduates.

([3]) OECD Economic Surveys: Estonia 2017

Graph 1.7: **Employment by sector**



Source: Eurostat

Social issues

Despite some recent improvements, income inequality in Estonia remains relatively high. In 2016, the Social Scoreboard showed that the net income of the top 20 % of households was 5.6 times higher than that of the poorest 20 %, while the EU average was 5.2. This is accompanied by worsening at-risk-of-poverty rate since 2010 which is particularly affecting older people, disabled and jobless households. Relatively low spending on social protection and the limited capacity of the tax and benefit system to redistribute wealth may explain the high income inequality. A personal income tax reform was adopted in 2017 to make the system more progressive. Simulations show that its effect on reducing income inequality is expected to be limited (see Box 3.3.2).

Estonia does relatively well in ensuring equal opportunities among the different population groups. In comparison to other EU countries, in Estonia the link between the risk of child poverty and the educational background of parents is relatively weak. Likewise, the variations in students' school performance that are due to their socioeconomic background are the smallest in the EU. However, access to healthcare is problematic, as reflected in the high and increasing incidence of unmet healthcare needs caused by waiting times for specialised care.

Table 1.1: **Key economic, financial and social indicators — Estonia**

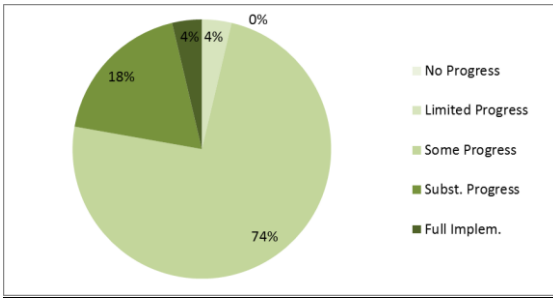
	2004-07	2008-12	2013-14	2015	2016	forecast 2017	2018	2019
Real GDP (y-o-y)	8.4	-1.5	2.4	1.7	2.1	4.3	3.3	2.8
Potential growth (y-o-y)	5.6	0.8	2.0	2.6	2.5	3.1	2.9	2.7
Private consumption (y-o-y)	9.6	-3.0	3.4	4.6	4.4	.	.	.
Public consumption (y-o-y)	4.5	1.1	2.6	3.3	1.9	.	.	.
Gross fixed capital formation (y-o-y)	13.3	-4.1	-3.8	-2.9	-1.2	.	.	.
Exports of goods and services (y-o-y)	14.8	5.4	2.6	-0.7	4.1	.	.	.
Imports of goods and services (y-o-y)	16.6	2.0	2.8	-1.8	5.3	.	.	.
Contribution to GDP growth:								
Domestic demand (y-o-y)	10.5	-3.2	1.2	2.3	2.4	.	.	.
Inventories (y-o-y)	0.2	-0.4	1.1	-1.3	0.7	.	.	.
Net exports (y-o-y)	-2.6	2.2	-0.1	0.9	-0.7	.	.	.
Contribution to potential GDP growth:								
Total Labour (hours) (y-o-y)	0.1	-1.0	0.3	0.9	0.8	0.8	0.5	0.3
Capital accumulation (y-o-y)	3.4	1.4	1.3	0.9	0.8	1.2	1.2	1.2
Total factor productivity (y-o-y)	2.0	0.4	0.5	0.8	0.8	1.0	1.1	1.2
Output gap	8.6	-2.0	1.6	1.0	0.5	1.8	2.2	2.2
Unemployment rate	7.2	11.6	8.0	6.2	6.8	6.9	7.7	8.5
GDP deflator (y-o-y)	7.8	3.6	2.5	1.2	1.6	4.3	3.6	2.9
Harmonised index of consumer prices (HICP, y-o-y)	4.6	4.5	1.9	0.1	0.8	3.7	3.1	2.6
Nominal compensation per employee (y-o-y)	15.6	3.7	5.6	3.3	5.9	6.4	5.5	5.2
Labour productivity (real, person employed, y-o-y)	6.5	0.1	1.4	-1.2	1.8	.	.	.
Unit labour costs (ULC, whole economy, y-o-y)	8.5	3.6	4.2	4.5	4.0	2.6	2.5	2.7
Real unit labour costs (y-o-y)	0.7	0.0	1.6	3.3	2.4	-1.5	-1.0	-0.2
Real effective exchange rate (ULC, y-o-y)	6.7	0.8	4.1	2.4	3.4	2.7	2.2	0.9
Real effective exchange rate (HICP, y-o-y)	2.0	1.0	2.7	0.8	1.6	0.4	2.9	.
Savings rate of households (net saving as percentage of net disposable income)	-9.0	4.4	5.3	7.4	7.3	.	.	.
Private credit flow, consolidated (% of GDP)	21.5	0.5	4.6	3.0	5.9	.	.	.
Private sector debt, consolidated (% of GDP)	104.8	133.7	116.9	115.2	115.4	.	.	.
of which household debt, consolidated (% of GDP)	36.1	49.7	39.8	40.3	41.4	.	.	.
of which non-financial corporate debt, consolidated (% of GDP)	68.7	84.1	77.2	74.9	74.0	.	.	.
Gross non-performing debt (% of total debt instruments and total loans and advances) (2)	.	5.6	2.3	1.9	1.5	.	.	.
Corporations, net lending (+) or net borrowing (-) (% of GDP)	-6.9	1.2	0.4	0.5	-0.1	0.5	0.9	0.6
Corporations, gross operating surplus (% of GDP)	32.7	29.8	31.1	28.2	26.6	27.7	27.8	28.0
Households, net lending (+) or net borrowing (-) (% of GDP)	-6.4	1.8	1.4	2.3	1.8	2.4	2.4	2.5
Deflated house price index (y-o-y)	.	-10.7	10.3	7.1	3.8	.	.	.
Residential investment (% of GDP)	5.4	3.1	3.7	4.4	4.8	.	.	.
Current account balance (% of GDP), balance of payments	-12.7	-1.0	0.4	2.0	1.9	1.7	1.5	1.4
Trade balance (% of GDP), balance of payments	-8.0	2.9	2.8	4.0	3.9	.	.	.
Terms of trade of goods and services (y-o-y)	1.8	-0.3	1.0	0.6	0.9	0.7	0.3	0.0
Capital account balance (% of GDP)	1.2	3.1	1.8	2.1	1.1	.	.	.
Net international investment position (% of GDP)	-78.9	-66.5	-48.5	-39.8	-37.1	.	.	.
Net marketable external debt (% of GDP) (1)	-16.9	-16.9	10.1	16.9	19.8	.	.	.
Gross marketable external debt (% of GDP) (1)	79.9	93.3	78.6	78.5	75.1	.	.	.
Export performance vs. advanced countries (% change over 5 years)	57.5	30.4	23.3	9.5	-3.5	.	.	.
Export market share, goods and services (y-o-y)	7.9	1.4	2.1	-7.8	5.9	.	.	.
Net FDI flows (% of GDP)	-6.4	-5.0	-1.7	0.6	-2.4	.	.	.
General government balance (% of GDP)	2.3	-0.8	0.3	0.1	-0.3	-0.2	-0.4	-0.5
Structural budget balance (% of GDP)	.	0.1	-0.3	-0.1	-0.4	-1.1	-1.4	-1.5
General government gross debt (% of GDP)	4.4	6.8	10.4	10.0	9.4	9.2	9.1	9.1
Tax-to-GDP ratio (%)	30.8	32.8	32.3	33.9	34.7	33.7	34.0	34.0
Tax rate for a single person earning the average wage (%)	19.8	19.1	19.6	18.5	18.3	.	.	.
Tax rate for a single person earning 50% of the average wage (%)	15.2	15.4	16.5	15.6	10.2	.	.	.

(1) NIIP excluding direct investment and portfolio equity shares
(2) Domestic banking groups and stand-alone banks, EU and non-EU foreign-controlled subsidiaries and EU and non-EU foreign-controlled branches.
Source: Eurostat and ECB as of 30 Jan 2018, where available; European Commission for forecast figures (Winter forecast 2018 for real GDP and HICP, Autumn forecast 2017 otherwise)

2. PROGRESS WITH COUNTRY-SPECIFIC RECOMMENDATIONS

Progress with the implementation of the recommendations addressed to Estonia in 2017([4]) has to be seen in a longer-term perspective since the introduction of the European Semester in 2011. Looking at the multi-annual assessment of the implementation of the CSRs since these were first adopted, 96 % of all the CSRs addressed to Estonia have recorded at least 'some progress'. 18 % of these CSRs recorded 'substantial progress' (see Graph 2.1). Substantial progress has been achieved in several areas of the labour market, for instance by introducing incentives to work in relation to the Work Ability reform.

Graph 2.1: **Overall multiannual implementation of 2011-2017 CSRs to date**



* The overall assessment of the country-specific recommendations related to fiscal policy excludes compliance with the Stability and Growth Pact.
** 2011-2012: Different CSR assessment categories.
*** The multiannual CSR assessment looks at the implementation since the CSRs were first adopted until the 2018 Country Report.
Source: European Commission

Over the years, Estonia has taken substantial measures to address challenges in the labour market. It has adopted and is implementing the Work Ability reform to employ people with reduced work ability, modified and introduced new active labour market policy measures to successfully bring the young and long-term unemployed to the labour market. These are all important steps to address the overall challenge of the shrinking labour force and tap into the potential of inactive people. Estonia has also taken action to improve work incentives by reducing the tax burden on labour for all income groups, including low-income earners. It has lowered the personal income, corporate income tax and unemployment insurance contribution rates, abolished the fringe-benefit tax on work–related studies and introduced a refund for low-income earners. Though the gender pay gap remains highest in the EU, the government has for many years fostered access to childcare by offering finances and modifying legislation. Implementation of the 2016-2023 Welfare Plan helps to tackle gender segregation in the labour market and to fight stereotypes. The impact of the reforms however remains to be seen.

Comprehensive reforms have been taken in the field of education and training. Since 2013, Estonia has adopted reforms in the higher education, vocational education and training and continues to rationalise school network to meet the demographic change. The government has taken steps to facilitate the transition from education to employment - it is implementing the Lifelong Learning Strategy 2014-2020 and the Adult Education Act adopted in 2015. The Vocational Education and Training programme for 2015-2018 helps to increase participation in vocational education and training and apprenticeships where the dropout rates remain a matter for concern.

The local government reform has been an important step towards improving Estonia's administrative capacity. For years, a mismatch between the fiscal capacity and devolved responsibilities of small municipalities hindered the provision of accessible and quality services. In 2016, Estonia adopted and is now implementing the local government reform that is expected to create viable local municipalities that can offer quality services.

Estonia has taken measures to strengthen the research and innovation system over the past years, but the low level of R&D intensity, especially in the business sector, remains a cause of concern. National authorities adopted the third Estonian R&I strategy in 2014 -"Knowledge-based Estonia 2014-2020", which aims at addressing some CSRs in the field of R&D – mainly internationalisation and specialisation of the R&D system. The Estonian government has also put in place several measures to improve science-business cooperation. Nevertheless, the weak level of knowledge transfer from the public research system to the private sector and the low

([4]) For the assessment of other reforms implemented in the past, see in particular section 4.1, 4.2, 4.3 and 4.5.

Table 2.1: **CSR progress — Estonia**

Estonia (CSRs are euro area relevant)	Overall assessment of progress with 2017 CSRs:
CSR 1: *Pursue its fiscal policy in line with the requirements of the preventive arm of the Stability and Growth Pact, which entails remaining at its medium-term budgetary objective in 2018. Improve the adequacy of the social safety net. Take measures to reduce the gender pay gap, in particular by improving wage transparency and reviewing the parental leave system.*	**Some progress** • Some progress in improving the adequacy of the social safety net • Some progress in reducing the gender pay gap • Limited progress in improving wage transparency • Some progress in reviewing the parental leave system
CSR 2: *Promote private investment, research, technology and innovation, including by implementing measures for strengthening the cooperation between academia and businesses*	**Some progress** • Some progress in promoting private investment in research, development and innovation • Some progress in strengthening cooperation between academia and businesses

1) This does not include an assessment of compliance with the Stability and Growth Pact.
Source: European Commission

technological capacity of firms continue to drag down Estonia's innovation performance.

Estonia has made some progress ([5]) in addressing the 2017 country-specific recommendations. Estonia has made some progress regarding reduction of the gender pay gap: modifications to the parental leave and benefits system will be implemented over the period 2018-2020 and there are plans to improve wage transparency in public sector entities. Some steps are being taken to provide more adequate pension, subsistence allowance and higher family allowances but social safety nets still do not provide adequate income support, especially for the older people. Several measures have been put in place to close the performance gap in R&I in the private sector and to strengthen academia-business cooperation.

European Structural and Investment (ESI) Funds are pivotal in addressing key challenges to inclusive growth and convergence in Estonia. ESI funds facilitate investment in R&D, enhance cooperation between business and academia, improve resource efficiency of enterprises, foster administrative reform and increase the effectiveness of the justice system. ESI Funds have been instrumental in improving labour market relevance of the education and training systems, reforming the general education school network, and helping the country stabilise energy consumption and shift towards a low-carbon economy (see Box 3.4.1).

Member States can request from the Commission technical support to prepare, design, and implement growth-enhancing structural reforms. The Structural Reform Support Service (SRSS) provides, in cooperation with the relevant Commission services, tailor-made technical support, which does not require co-financing and is provided at a Member State's request. The support addresses priorities identified in the context of the EU economic governance process (i.e., implementation of country-specific recommendations), but the scope of the SRSS support is wider as it can also cover reforms linked to other Commission priorities, or reforms undertaken at the initiative of Member States. Estonia has requested technical support from the SRSS to help implement reforms in the financial sector, by improving financing options for companies in particular.

([5]) Information on the level of progress and actions taken to address the policy advice in each respective subpart of a CSR is presented in the Overview Table in the Annex. This overall assessment does not include an assessment of compliance with the Stability and Growth Pact.

Box 2.1: **Tangible results delivered through EU support to structural change in Estonia**

Estonia is a beneficiary of European Structural and Investment Funds (ESI Funds) support and can receive up to EUR 4.4 billion until 2020. This represents around 3 % of GDP annually over the period 2014-2018 and 44% of public investment ([1]). By 31 December 2017, an estimated EUR 2.5 billion (57 % of the total) was allocated to projects on the ground. This has paved the way for over 830 enterprises to cooperate with research institutions; over 4000 firms are being supported; the capacity of childcare infrastructure is raised to accommodate 640 more children. Compared with 2007-2013 the use of financial instruments is planned to increase by 57%.

ESI Funds help address structural policy challenges and implement country-specific recommendations. Actions financed cover, among others, facilitating private sector R&D&I activity (a programming target is to increase private sector R&D expenditure up to 2% of GDP by 2023); enhancing cooperation between business and academia; improving resource efficiency of enterprises, and fostering economic development of regions. Public services quality, including via local government reform and support to the effectiveness of the justice system is also being improved. Access to high-speed internet for the whole population is underway. Investment in sustainable transport is expected to improve connections between different transport and mobility nodes, and to double the number of train passengers per year (from 4.2m in 2013 to 8.4m in 2023). The Work Ability Reform is expected to bring an estimated 15 000 currently unemployed or inactive persons, with reduced work ability, to employment by 2020, services for activation have been offered already to 21 468 people. Support is provided to improve labour market relevance of education and training systems; and reforming the general education school network. The Funds are also helping to make the shift towards a low-carbon economy to stabilise energy consumption in 2020 at the 2010 level.

Various reforms were undertaken already as precondition for ESI Funds support ([2]). Smart Specialisation Strategy framework for research and innovation was developed to foster specialisation in domains with strong market potential. This has also helped improve cooperation between entrepreneurs, public R&D institutions, clusters and competence centres to better enable the enterprises create new innovative products and services. The national transport plan has allowed the timely preparation of projects, implemented not only with support from ESI Funds, but also from the Connecting Europe Facility (CEF), European Investment Bank (EIB) loans and national funding. The mapping of healthcare investment needs prepared the ground for concentrating specialised care into competence centres and establishing a network of first-contact healthcare centres.

Estonia is also advancing the take up of the European Fund for Strategic Investments (EFSI). As of December 2017, overall financing volume of operations approved under the EFSI amounted to EUR 112 million, which is expected to trigger total private and public investment of EUR 803 million. More specifically, 5 projects involving Estonia have been approved so far under the Infrastructure and Innovation Window (including 4 multi-country projects), amounting to EUR 43 million in EIB financing under the EFSI. This is expected to trigger about EUR 111 million in investments. Under the SME Window, 6 agreements with financial intermediaries have been approved so far. European Investment Fund financing enabled by the EFSI amounts to EUR 69 million, which is expected to mobilise approximatively EUR 691 million in total investment. Some 5 222 smaller companies or start-ups will benefit from this support. SMEs rank first in terms of operations and volume approved, followed by transport and R&D.

Funding under Horizon 2020, the Connecting Europe Facility and other directly managed EU funds is additional to the ESI Funds. By the end of 2017, Estonia has signed agreements for EUR 208 million for projects under the Connecting Europe Facility.

([1]) Public investment is defined as gross fixed capital formation + investment grants + national expenditure on agriculture and fisheries.

([2]) Before programmes are adopted, Member States are required to comply with a number of so-called ex-ante conditionalities, which aim at improving conditions for the majority of public investments areas. https://cohesiondata.ec.europa.eu/countries/EE

3. REFORM PRIORITIES

3.1. PUBLIC FINANCES AND TAXATION

3.1.1. BUDGETARY DEVELOPMENTS AND FISCAL FRAMEWORK

Estonia has loosened its fiscal policy over the past year, as new expenditure plans from 2018 onwards are not fully covered by revenue increases. For 2018, the government has announced tax reforms that shift taxation from labour to consumption. On the expenditure side, it has increased funding for policy priorities in healthcare, education and social funding. The government has also announced an investment programme of 0.4 % of GDP each year over 2018-2020. This will finance infrastructure in transport and information and communications technologies, as well as some specific housing and tourism projects.

Estonia's nominal fiscal position is set to remain in a small deficit, but its structural deficit is expected to increase more substantially to about 1.5 % of GDP in 2018 and 2019([6]). According to the Commission autumn forecast, the nominal deficit remains practically unchanged between 2016 and 2019 at slightly below ½ % of GDP (European Commission, 2017a). However, given that in structural terms the deficit is estimated by the Commission to be substantially larger, Estonia risks missing its budgetary targets.

Medium- and long-term risks to the sustainability of public finances are low, given the current very low level of public debt. Long-term fiscal sustainability risks are also assessed as low because spending pressures related to population ageing are contained. Notably, public pension expenditure (including the new working ability benefits that are replacing disability pensions) as a share of GDP is projected to fall steadily through 2070, mainly due to a decline in the average public (first-pillar) pension vis-à-vis average wages ([7]). The total (public plus private) pension income as a share of average wage at retirement (the gross average replacement ratio) is projected to remain almost unchanged in the future. However, pensions are relatively low and pension adequacy is a concern because the share of the elderly population at risk of poverty is higher in Estonia than the EU average (see also Section 3.3.2.).

The cornerstone of Estonia's fiscal framework is the budget balance rule (medium-term fiscal targets) in structural terms. By contrast, expenditure rules or binding expenditure targets are not used, which may limit the fiscal framework's ability to counter cyclical factors in the economy. The Fiscal Council([8]) assesses the macroeconomic and public finance forecasts used for budgetary planning and monitors compliance with the budgetary rules.

([6]) Essentially, the currently good economic times have a 'windfall effect' on the fiscal position. Discounting this positive effect arising from the favourable economic cycle, the underlying fiscal position is estimated to be weaker than the nominal balance.

([7]) This occurs because first, public pensions grow at a slower pace than wages because they are indexed 80% to the wage bill and 20% to the CPI, and secondly, because part of the social contributions and associated pension rights are switched to the mandatory private individual (second-pillar) pensions to fund the transition to two-pillar pension system. Thus, total pension expenditure (public plus private) as a share of GDP remains broadly stable as the decline in public pension spending is mostly compensated by the growing private individual pensions (see European Commission, "Ageing Report 2018" forthcoming).

([8]) http://www.eelarvenoukogu.ee.

3.1.2. TAXATION FRAMEWORK

Estonia's overall tax burden stands at about 35 % (European Commission, 2017b) of GDP, below the 40 % average for the EU. In 2017, indirect taxes are projected to have amounted to 15 % of GDP (compared to 13.5 % for the EU) and direct taxes to about 8 % of GDP (against 13 % for the EU).

Estonia has a comparatively efficient tax administration, which is supported by information and communications technology to facilitate tax compliance. According to "Paying taxes 2018" report in 2016 it took 50 hours a year for a business to comply with its tax obligations — the most efficient outcome in the EU. The time needed to comply with and obtain VAT refunds and to comply with corporate income tax (CIT) is among the lowest in the EU (PricewaterhouseCoopers, 2018). This efficiency reflects the extensive use of ICT: e-filing of tax returns is widespread and pre-filing of personal income tax returns is widely used. Overall, tax compliance is relatively good and improving. For example, between 2013 and 2015 the VAT gap([9]) in Estonia narrowed by over two thirds. At 4.9 % of the VAT total tax liability in 2015, it was considerably lower than the EU average of 12.8 % (Center for Social and Economic Research, 2017).

Incentives in the tax system

Estonia's tax system has a relatively growth-friendly structure, with comparatively low direct taxes. Also, as companies can deduct all business-related expenses, and there is no CIT on retained profits([10]), the CIT system is supportive of investment in research and development, even though there are no special provisions that specifically favour R&D activities. While this encourages high levels of investment, there is no incentive to prioritise R&D over other types of investment. Some changes to CIT will be applied in 2018, including a reduction in the tax rate to 14 % (from a standard tax rate of 20 %) for regular profit distribution. The aim is to make Estonia's business environment more attractive to foreign investors and to encourage companies to distribute their excess retained earnings on a regular basis ([11]). In addition, from 2018 Estonian resident credit institutions are subject to an advance corporate income tax obligation. The purpose of this new provision is to provide the state budget with more regular income tax revenues. The tax rate is 14 % and it will be calculated and paid quarterly on accrued profits.

Some features of Estonia's corporate tax system might be used by multinational companies for aggressive tax planning. Such features include in particular the lack of certain anti-abuse rules ([12]) and of withholding taxes on dividend and interest payments ([13]) which may lead to those payments escaping tax altogether, if they are also not subject to tax in the recipient jurisdiction. This may facilitate aggressive tax planning. In a recent study ([14]) on the best theoretical dividend repatriation route, Estonia appears as a possible conduit country for repatriating dividends. The provisions of the Anti-Tax Avoidance Directives will have to be transposed into national law by the end of 2018 and 2019. This will introduce new anti-abuse rules. It will be important to assess to what extent the transposition of these Directives will limit the scope for aggressive tax planning in Estonia.

Estonia taxes property and transport much less heavily than the EU average. Recurrent property taxes, which are least detrimental to growth, amounted to 0.3 % of GDP in 2015. Total revenue from property taxes stood at 0.4 % of GDP in 2015. This is the second lowest in the EU and considerably lower than the EU average of 2.6 %. There has been no re-evaluation of land value

([9]) The tax gap is the difference between the amount of tax actually collected and the estimated amount of tax that is theoretically collectable based on tax legislation.

([10]) CIT is charged only on profits that are distributed as dividends, share buy-backs, capital reductions, liquidation proceeds or deemed profit distributions (such as transfer pricing adjustments, expenses and payments not related to business, gifts, donations and entertainment expenses).

([11]) Profit distribution is deemed to be regular if the amount of the distribution does not exceed the average distributed profits from the last 3 years subject to taxation in Estonia.

([12]) Estonian tax law has extensive general anti-avoidance rules but lacks anti-abuse rules such as interest limitation and thin capitalisation rules and controlled foreign companies rules. These rules should be adopted by Member States according to the Anti-Tax Avoidance Directive (Council Directive (EU) 2016/1164 of 12 July 2016).

([13]) Ramboll Management Consulting and Corit Advisory (2016).

([14]) van't Riet and Lejour (2017).

(local tax base) to take into account the growth in market prices since 2001.

In 2016, environmental taxes amounted to 3.1 % of GDP, above the EU average of 2.4 %([15]). Most revenues come from taxes on energy. However, Estonia does not have any vehicle taxation apart from a circulation tax for heavy goods vehicles and, beginning in 2018, a new heavy goods vehicle road usage charging scheme. As a result, receipts from transport taxes (excluding fuel taxes) amounted to only 0.06 % of GDP, the second lowest in the EU([16]). At the same time, new vehicles purchased in Estonia are the most environmentally unfriendly in the EU, with average CO2 emissions of 134 grams per kilometre, above the EU average of 118 grams in 2016 (European Environment Agency, 2016).

Estonia continues to reduce the tax burden on labour and adds an element of progressivity as of 2018. In 2018, the personal income tax (PIT) tax-free allowance will increase significantly from EUR 180 to EUR 500 per month. The tax-free allowance for people earning more than the average salary will decrease steadily and reach zero once a person's salary exceeds EUR 2 100 per month, adding an element of progressivity to Estonia's income tax system. Still, the level of progressivity remains relatively low and contributes little to reduce overall disposable income inequality (see Box 3.3.2). However, the reform should help to reduce the previously relatively high tax wedge ([17]) for low-wage earners and benefit both low- and medium-earner groups.

Funding of municipalities

Local authorities' ability to influence their revenues is highly constrained, which can limit their capacity to provide sustainably high-quality services. The recent local government reform has reduced the number of local authorities from 213 to 79, but the next stage of the reform is still pending. This aims to balance the financial resources and responsibilities of the new local entities. Local government's revenue base is dependent on decisions taken at the central government level. Sustainability of financing is inevitable for providing quality services and guaranteeing their universal delivery at local level.

([15]) Eurostat: Environmental tax revenues (http://ec.europa.eu/eurostat/web/products-datasets/-/sdg_17_50)

([16]) As of 2018, heavy goods vehicles in Estonia will be subject to road usage fees that will partly depend on their emissions.

([17]) The tax wedge on labour represents the difference between the total labour cost of employing a worker and the worker's net earnings. It is defined as personal income tax and employer and employee social contributions (net of family benefits) as a percentage of total labour costs (the wage and employer social contributions).

3.2. FINANCIAL SECTOR

3.2.1. BANKING SECTOR

The Estonian banking sector is stable and well capitalised. The average capital adequacy ratio in June 2017 was the highest in the EU, largely due to the highest-quality Tier 1 capital instruments (Table 3.2.1). The non-performing loan ratio remained low at 2 %. The good quality of banks' loan portfolios underpins their good profitability. The average return-on-equity ratio is 11.1 % and the return on assets 1.5 % (2016), well above the EU averages of 3.5 % and 0.2 %, respectively. Regarding liquidity, since 2010 banks have halved their reliance on funding from their Swedish parent banks by replacing it with local deposits. However, the loan-to-deposit ratio remains above 100 %, indicating a remaining deposit funding gap in banks' balance sheets. This can be filled by parent bank funding or financing on the capital market. According to the Bank of Estonia ([18]), a downturn in the Nordic economies is the main risk to financial stability at the current juncture.

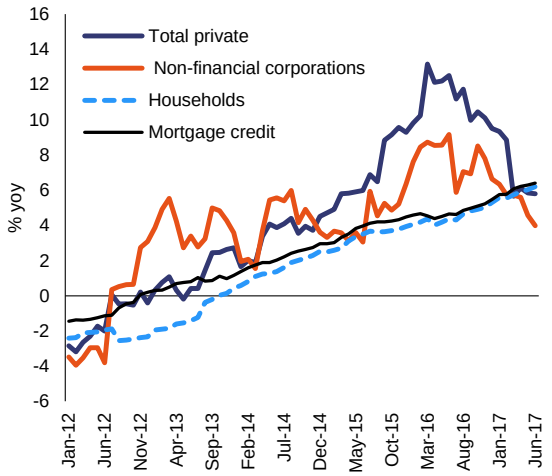
Table 3.2.1: **Financial soundness of banks**

(%)	2010	2011	2012	2013	2014	2015	2016	2017Q2
Non-performing debt	9.3	4.5	3.0	1.9	2.6	1.9	1.5	1.9
Non-performing loans	-	-	-	-	3.2	2.2	1.7	2.0
Non-performing loans NFC	-	-	-	-	2.8	2.9	2.4	3.0
Non-performing loans HH	-	-	-	-	4.0	3.0	2.2	2.1
Coverage ratio	85.0	53.4	75.0	75.3	37.7	42.5	46.8	30.0
Loan to deposit ratio*	162.8	144.5	134.4	128.9	124.0	122.1	122.5	123.3
Tier 1 ratio	12.7	18.5	22.8	22.7	41.3	34.9	33.8	35.3
Capital adequacy ratio	16.3	19.4	23.2	23.1	41.8	35.4	34.4	35.9
Return on equity**	3.6	22.9	11.7	10.7	9.7	6.8	11.1	-
Return on assets**	0.4	3.1	2.0	1.8	1.6	1.1	1.5	-

*ECB aggregated balance sheet: loans excl. to government and MFI / deposits excl. from government and MFI.
** For comparability only annual values are presented.
Source: ECB CBD

Credit growth is moderate. Since early 2016, lending to corporations has fallen from annual growth rates of close to 10 % to 4 % in June 2017 (Graph 3.2.1). Lending to households has been picking up steadily since 2012 on the back of increasing mortgage loans. In June 2017, both loans to households and mortgage loans were growing at 6 % annually. Financial regulations to mitigate risks to the financial system as a whole have been tightened over recent years and the possibility of deducting mortgage interest payments from tax bills has been reduced. If the credit market were to show significant growth or housing prices picked up again, the Bank of Estonia could consider suggesting new macro-prudential measures such as a counter-cyclical capital buffer.

Graph 3.2.1: **Credit growth**



Source: ECB

Concentration in the financial sector is high but there are no visible signs that it is impeding access to finance. Over 80 % of the market belongs to three large banks. The high level of concentration in the financial sector could result in a lack of competition on the financial market. Still, the ample liquidity of banks is providing easy access to credit. Only about 6 % of Estonian SMEs consider access to finance their most important problem, in line with the EU average of 7 %([19]). However, bank margins for mortgage loans are high relative to the euro area average and the gap in the average credit cost between Estonia and the euro area has been widening recently. At the same time, micro enterprises, newly created companies or firms established in the countryside may have bigger constraints in obtaining the financial resources they need, notably due to insufficient collateral. The proportion of SMEs pointing to insufficient collateral or guarantees as the main obstacle to getting necessary financing is double the EU average (26 % vs 13 %).

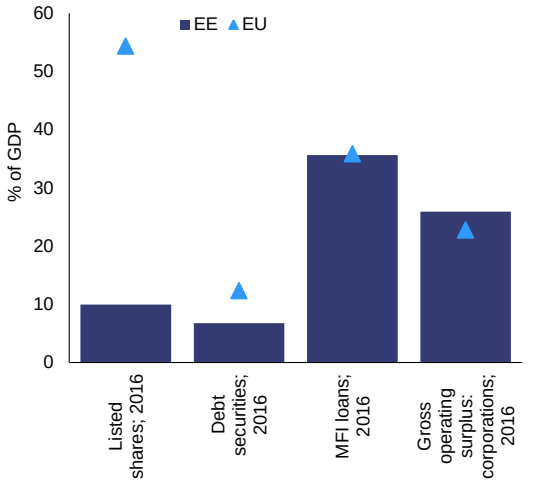
Access to finance in Estonia is supported by several government initiatives. The Kredex agency runs a subordinated loan programme delivered through commercial banks. It also

([18]) Eesti Pank (2017), Financial Stability Review 2/2017.

([19]) SAFE survey 2017.

contributes to two capital market instruments aiming to provide an additional push to the Estonian start-up ecosystem. The Baltic Innovation Fund (BIF) has been a success story. In 2017, it managed to raise EUR 325 million, more than one third of this from local pension funds. Moreover the fund managers of EstFund have been selected and are expected to start investing in 2018 through a venture capital fund, an expansion capital fund and a business angel co-investment fund (see Country Report 2017).

Graph 3.2.2: **Business financing sources**



Source: ECB, European Commission, Invest Europe

Estonian capital markets remain underdeveloped and illiquid. The stock exchange's capitalisation has fallen to 10 % of GDP (see Graph 3.2.2) and trading volume has shrunk considerably since 2007. Initial public offering (IPO) activity peaked in 2005-2007 when Estonia was starting to benefit from EU membership, but the volume has now tapered off to one to two new issues per year. Two state-owned enterprises plan to arrange IPOs 2018([20]). Both will be partial privatisations through the stock exchange. Estonia lacks a government bond market and the commercial bond market is poorly developed. The establishment of a unified exchange — NASDAQ Baltics covering the stock exchanges in Tallinn, Riga and Vilnius — has triggered harmonisation of the three markets.

([20]) Port of Tallinn and Eesti Energia renewable energy unit Enefit

Estonia is keen on pursuing a regional approach to developing capital markets. Harmonising the legal framework among the Baltic neighbours may create an inventory of financial products such as covered bonds, investment funds and securitisation assets. The objective is to increase the size of these market segments in order to attract investors. With this goal, in November 2017 the Ministry of Finance signed a Memorandum of Understanding with its peer ministries from Latvia and Lithuania on regional capital market development. Estonia has also shown a keen interest in developing new financial services such as crowdfunding and financial technology financing hubs as it is already one of the EU's frontrunners in the digital market and cybersecurity. This is increasing the choice of financing options in the economy, bringing in innovation and creating new jobs.

Local investors are needed to support the local economy. Estonian companies are small and thus unattractive for European and global financial investors. On the other hand, Estonian pension funds have accumulated assets which are now worth EUR 3.5 billion (16 % of GDP). This is equivalent to the sum of the stock market's capitalisation of EUR 2.5 billion and private equity and venture capital assets of EUR 1 billion. However, due to the regulation and the lack of investment opportunities, less than 10 % of the pension funds' investment is local. For comparison, in the euro area the average share of investment in local assets is 59 % for bonds and 43 % for equity([21]). In 2015, the government passed some measures to increase the domestic focus for pension fund investments.

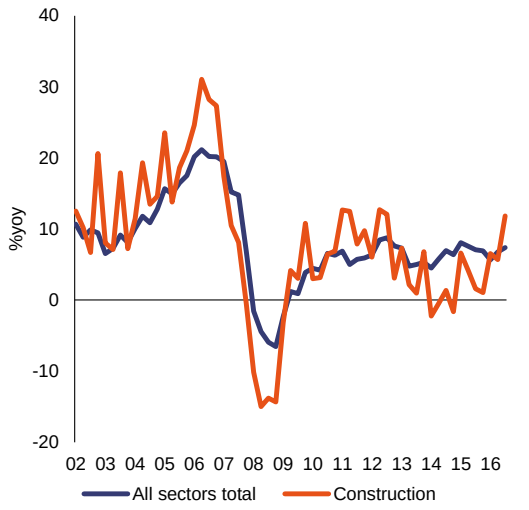
Estonia has requested technical support from the Commission's Structural Reform Support Service to help implement reforms in the financial sector. In particular it wants to improve financing options for companies and support capital market development.

([21]) DNB Working Paper (2016): International investment positions revisited: Investor heterogeneity and individual security characteristics. See also European Commission (2017): 2017 Country Report: The Netherlands.

Housing market

House price increases slowed down over 2016-2017 as housing supply caught up with demand. Housing construction remained buoyant in 2017, while construction investment picked up over 2017 in the other sectors of the economy as well. As a result, price pressures in the construction sector have resurfaced, but not to the degree seen in the 2008 boom (see Graph 3.2.3). Growth in lending for house purchases continues (see Graph 3.2.1) but is still broadly in line with GDP and wage growth. Overall, considering that house price pressures have eased and lending growth is still relatively moderate, risks stemming from the housing market are contained.

Graph 3.2.3: **Wage growth in construction vs total economy**



Source: Statistics Estonia

3.3. LABOUR MARKET, EDUCATION AND SOCIAL POLICIES

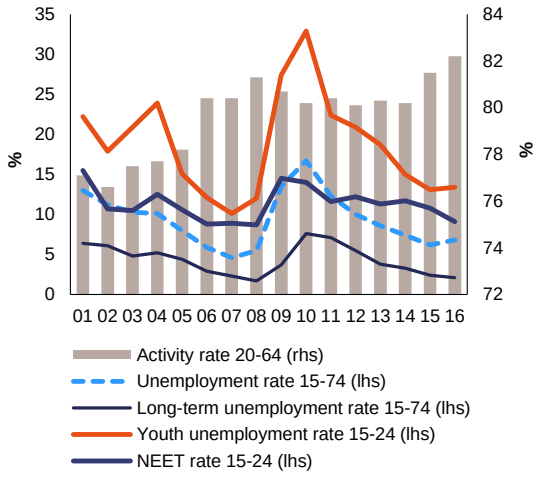
3.3.1. LABOUR MARKET CHALLENGES

Labour market

Activity and employment rates in Estonia are well above the EU average. In 2016, employment continued to grow in line with GDP growth with 2 000 more jobs created. The employment rate in 2016 stood at 76.6 %, way above the Europe 2020 and national targets. Over the last few years, activity rates have also increased, partly due to increases in the retirement age and the more recent 2017 Work Ability reform. Unemployment has been steadily declining since the second half of 2010 and is currently among the lowest in the EU (6.8 % in 2016), with the falling trend also affecting young people and the long-term unemployed (Graph 3.3.1). On the back of strong economic growth (see Section 1.), unemployment fell further to 6 % in 2017, from 7.3 % a year earlier, equivalent to 11 000 less unemployed persons. However, unemployment is expected to increase moderately in the coming years as the Work Ability reform brings increasing numbers of people with reduced work ability back into the labour market.

The good labour market performance masks a real structural bottleneck caused by the shrinking working age population. Demographic projections anticipate Estonia's population will decline due to low birth rates, similarly to developments in the EU([22]). Inward return migration has started to offset the net outward migration that prevailed during the last decade, but it is not enough to reverse the demographic trend. According to Eurostat, the working age population will shrink by 51 000 persons in 2025([23]).

Graph 3.3.1: **Key labour market indicators**



Activity rate and Employment rate (% of population), total, ages 20-64.
Unemployment rate and long-term unemployment rate (% of labour force), total, ages 15-74.
Youth unemployment rate (% of labour force), total, ages 15-24.
NEET: Not in employment, education or training (% of population), total, ages 15-24.
Source: Eurostat

The Work Ability reform is effectively increasing labour supply. The reform introduced new rules for beneficiaries of work allowance which are in effect since July 2016. New measures are helping to make people with partial ability to work to become more active. The Estonian authorities anticipated that overall around 12 000 previously inactive people became active by end-2017. However, as this vulnerable group takes longer to find employment, the unemployment rate is forecast to rise. The reform effects will take some time to show its full effect.

([22]) Employment and Social Developments in Europe, Annual Review 2017, European Commission, Luxembourg: Publications Office of the European Union, 2017.
([23]) Eurostat population projections, (20-64, for the period 2015-2025) http://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&plugin=1&pcode=tps00002&language=en

Box 3.3.1: **Monitoring performance in light of the European Pillar of Social Rights**

The European Pillar of Social Rights, proclaimed on 17 November 2017 by the European Parliament, the Council and the European Commission, sets out 20 key principles and rights to benefit citizens in the EU. In light of the legacy of the crisis and changes in our societies driven by population ageing, technological change and new ways of working, the Pillar serves as a compass for a renewed process of convergence towards better working and living conditions.

ESTONIA		
Equal opportunities and access to the labour market	Early leavers from education and training (% of population aged 18-24)	On average
	Gender employment gap	On average
	Income quintile ratio (S80/S20)	Better than average
	At risk of poverty or social exclusion (in %)	On average
	Youth NEET (% of total population aged 15-24)	Better than average
Dynamic labour markets and fair working conditions	Employment rate (% population aged 20-64)	Better than average
	Unemployment rate (% population aged 15-74)	To watch
	GDHI per capita growth	Better than average
Social protection and inclusion	Impact of social transfers (other than pensions) on poverty reduction	Weak but improving
	Children aged less than 3 years in formal childcare	On average
	Self-reported unmet need for medical care	Critical situation
	Individuals' level of digital skills	On average

Members States are classified according to a statistical methodology agreed with the EMCO and SPC Committees. The methodology looks jointly at levels and changes of the indicators in comparison with the respective EU averages and classifies Member States in seven categories (from "best performers" to "critical situations"). For instance, a country can be flagged as "better than average" if the level of the indicator is close to EU average, but it is improving fast. For methodological details, please consult the draft Joint Employment Report 2018, COM (2017) 674 final.

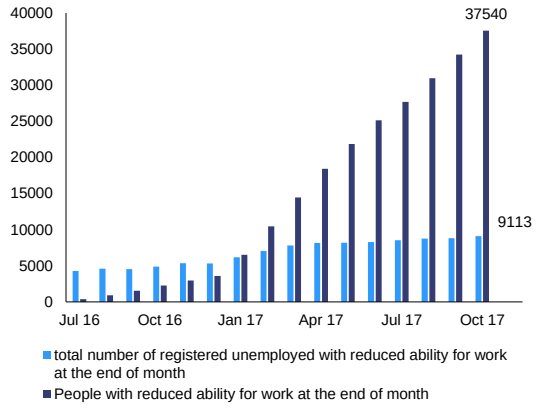
Estonia performs relatively well on a number of the indicators of the Social Scoreboard([24]) supporting the European Pillar of Social Rights, while challenges remain. Estonia's labour market has been improving on the back of strong economic growth. It has a relatively high employment rate and a rather low rate of youth not in education, employment or training (NEET). Nevertheless, the self-reported unmet need for medical care shows worsening trends. Social transfers do not appear effective in reducing poverty in the EU. The weak social safety net has had implications for both poverty and inequality in Estonia, although both indicators show signs of improvement.

In 2015, Estonians reported high rates in the EU of unmet need for medical care. This is caused by high waiting times for specialist care due to weak care coordination. The assessment of the patient pathways points to avoidable specialist treatment and hospitalisation in the current system.

Estonia is has a promising policy for providing support and outreach to youth under the Youth Guarantee scheme. Over 4000 workshops have been organised from 2015 to July 2017 for young people aged 15 or above who are about to enter the labour market and start their working lives (e.g. how the labour market functions, what to consider when looking for a job or planning a career, and what are the possibilities to get labour market related help, if such a need arises) Partnerships for the Youth Guarantee are in place, bringing together the public employment service with employers and education providers. An IT solution will aggregate data from numerous national registries and identify NEET youth. This will enable social workers to approach and inform these young people of available services in different municipalities.

([24]) The Social Scoreboard includes 14 headline indicators, of which 12 are currently used to compare Member States performance. The indicators "participants in active labour market policies per 100 persons wanting to work" and "compensation of employees per hour worked (in EUR)" are not used due to technical concerns by Member States. Possible alternatives will be discussed in the relevant Committees. GDHI: gross disposable household income.

Graph 3.3.2: **Impact of work ability reform on unemployment (by disability class)**



Source: European Commission's calculations

Overall, the participation in active labour market policies (ALMP) appears to be low. The proportion of the unemployed who contact the public employment service in search of a job in Estonia is above EU average (54 % in 2016 vs 46 % EU average)([25]). However, with only 5 % of people wanting to work actually benefiting from ALMP support, there are indications that Estonia had in 2015 one of the lowest levels of participation in ALMPs in the EU. This was coupled with one of the lowest levels of expenditure on ALMP in the EU (0.1 % of GDP in 2015). Nevertheless, while still below EU average, in 2016 there were strong signs of improvement, with ALMP participation and expenditure reaching 16 % and almost 0.2 % of GDP respectively.

Nonetheless, the personalised ALMP provision for those who are registered as unemployed in Estonia is effective. The service is based on a system of individual action plans (JIA). The effectiveness of this policy seems to be greater than in the rest of the EU. For example, in 2015, 37 % of long-term unemployed with a JIA regained employment, compared to the EU average of 14 %, and Estonia also has the highest estimated probability in the EU of the long term unemployed finding work (20 % in 2016)([26]). Additional measures are planned for regions with high unemployment and where the labour is also less mobile to fill vacancies in other parts of the country.

Gender pay gap

The parental leave system is one of the factors behind the persistently high gender pay gap. Though decreasing since 2013, the gender pay gap in Estonia is still the highest in the EU at 26.9 % in 2015 (EU average 16.3 %). The parental leave system in Estonia is generous compared to other countries, entitling parents to 18 months of leave at full wage replacement rates and giving them the right to return to their old job until their child's third birthday. The length of the parental leave, combined with the fact that parental leave is primarily taken up by women, contribute to the gender pay gap since women interrupting their careers to take care of children have less chances to find or come back to better paid jobs.

Changes to the parental leave system are currently under way. Since 2016, the parental leave system is regulated by the Family Benefits Act, which consolidates all previous legislation on family benefits. The parental benefit reform adopted in December 2017 will be implemented over the period 2018-2020. It aims to introduce greater flexibility for workers to combine the parental benefit with employment([27]), and provides one month of parental leave exclusively for fathers. In 2016, 9 % of fathers took parental leave and the reform is expected to facilitate greater use of this possibility. The government plans to discuss the second stage of the reform in spring 2018. This is likely to concern further changes in maternity leaves and benefits.

The government plans to introduce transparency requirements to reduce the wage gap in the longer term. The planned changes to the Gender Equality Act (due to be approved by the government in spring 2018) are a step in the right direction that will require public sector entities to make their payrolls transparent. An IT tool is expected to be developed in 2019 to analyse the wage differences between genders in both the public and private sectors. If the tool finds

([25]) Based on EU-Labour Force Survey data. See also figure 37 in the 2018 Draft Joint Employment Report.

([26]) According to the Indicator Framework for Monitoring the Council Recommendation on the integration of the long-term unemployed into the labour market.

([27]) The possibility to combine part-time work with parental leave and the increased ceiling for permitted employment-related income while receiving parental benefit could encourage parents to have shorter breaks from employment.

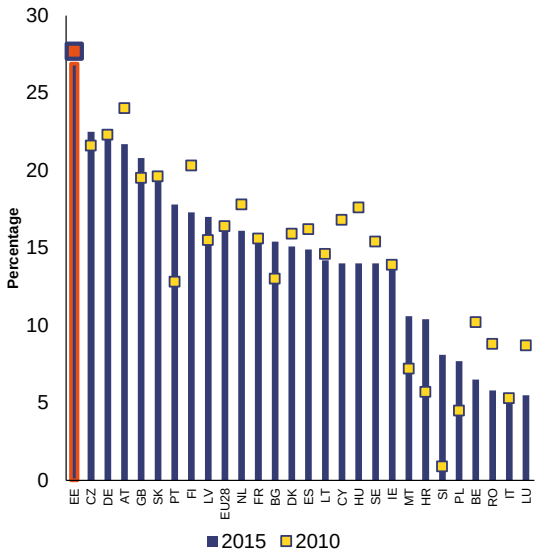
discrepancies in data broken down by gender, the employer will be obliged to provide explanations. Where the discrepancy cannot be justified, the employer will have to introduce changes or could be fined. The success of the reform depends on the detailed regulation and its actual implementation.

More childcare and day-care options for people with disabilities will be provided in 2018. Beyond the established childcare facilities supported by EU funds, there are plans to support more flexible childcare services at irregular hours,. Access to childcare for disabled children has improved. However, in 2016 over 20 % of carers for adult family members, mostly women, still could not go out to work because care provision was lacking or too costly. In 2018, day-care and week-care places for people with mental health issues and severe multiple disabilities will be created. The reforms are expected to help women with care responsibilities to seek employment.

Care responsibilities and related career breaks, mainly taken by women, might increase the gender gap in pensions. Currently, Estonia's gender gap in pensions is the lowest in the EU. This is because the current generation of pensioners did not have long career breaks for raising children. However, the proportion of women who were outside the labour market due to care responsibilities was over 30 % in 2016, compared to less than 20 % in the EU. This could lead to an increasing pension gap in the future([28]). Provisions are in place to recognise people's previous care responsibilities when they reach old age and to provide partial compensation for the consequent gap in the state funded pension. The planned reform of the parental leave system is expected to narrow the gender pay gap and so ease gender pension gap concerns in the long term.

([28]) Espenberg et al (2014) have estimated that the pension gap in Estonia between women and men who have children would be 19 % in 2047.

Graph 3.3.3: **Gender pay gap in unadjusted form**



Note: The gender pay gap is calculated as the difference between the average gross hourly wages of male and female paid employees, as a % of wages of male employees. Data are based on data from the Structure of Earnings data and cover the Industry, construction and services sector (exc. public administration, defence and social security) and excludes workers from companies with less than 10 employees.
Source: Eurostat

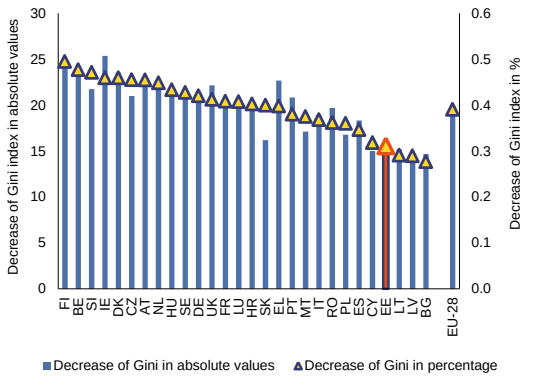
3.3.2. SOCIAL POLICY (POVERTY, SOCIAL ASPECTS OF SOCIAL SECURITY SYSTEMS)

Estonia spends less on social protection than its EU peers and its social safety net is inadequate, particularly taking into account the increasingly ageing population. Per capita spending on social protection and weighted spending on social protection are among the lowest in the EU. The impact of social transfers on reducing poverty amounted to 25 % in 2016, i.e. below the EU average of 33 %. Meanwhile, the risk of poverty or social exclusion has been increasing overall since 2010 and reached the EU average of about 24 % in 2016. The increase has been driven mainly by a big rise in monetary poverty since 2010- the at risk of poverty rate stands around 22 % making Estonia to become one of the poor performers in the EU despite it having been below the EU average in 2010. This relative poverty rate is particularly high for people living in jobless households; at 78 % it is the highest in the EU. Latest information on poverty and income inequality indicate that no significant changes are

expected in the at-risk-of poverty rate for income reference year 2016([29]). However, as concerns unemployment benefits, Estonia ranks close to EU average for indicators related to adequacy and coverage, while maximum duration (for a 1-year work record) is comparatively high ([30]). Moreover, the self-employed have access to unemployment benefits and other aspects of social protection. Risk of poverty or social exclusion for people with disabilities is high at 39.4 %. In addition, the at-risk-of-poverty-or-social-exclusion gap between people with disabilities, mostly older people, and those without is also higher than the EU average in Estonia at 20.9 percentage points (EU average 10.1 percentage points). At the same time family allowances have been increased, especially for larger families and this has reduced relative poverty among children.

Income inequality remains relatively high (Graph 3.3.4**) despite recent improvements.** In 2016, the income of the top 20 % of households was 5.6 times higher than that of the poorest 20 %, and improvement from 6.2 in 2015. This is higher than the EU average. Low spending on social protection and the limited redistribution capacity of the tax and benefits system to redistribute wealth (Graph 3.3.4) are the main drivers of the inequality. Recent reforms to personal income tax (see Box 3.3.2) are expected to have only a limited impact on reducing income inequality.

Graph 3.3.4: **Corrective power of taxation and social transfers, 2016**



(1) Difference between the Gini coefficients for market income inequality (i.e. before tax and benefits) and disposable income inequality (i.e. after tax and benefits). Income data are adjusted for household size (equalisation). The scale of Gini coefficient is from 0 to 100. The value 0 corresponds to perfect equality (same income to everybody) while 100 corresponds to maximum inequality (all income distributed to only one person and all the others have nothing.
(2) No 2016 data available for IE, IT, and LU, 2015 data used instead.
(3) EU average is calculated as the population-weighted average of individual national figures.
(4) EU-SILC 2016 data are based on income generated in 2015 (with the exception of IE and UK.
Source: European Commission, Tax Policies in the EU: 2017 Survey (forthcoming) , based on Eurostat data

The minimum income system became slightly more generous. According to Eurostat, in Estonia only around 1% of all social protection benefits are means tested (EU average is 10.6%). The subsistence benefit([31]), which is well below the poverty threshold and low compared to the income of low wage earners, is the most used means tested benefit (ESPN 2018). It was increased from 2018 and the system became more flexible. The subsistence level increased from EUR 130 to EUR 140 for the first adult in each household and to EUR 168 for each minor.. This increase was accompanied by incentives for people to return to work. These entail allowing benefits to overlap with income from employment for a limited period. Further changes also apply from 2018 for sole-proprietors. They receive similar tax treatment to companies, increasing their social protection. While these are steps in the right direction, their impact on reducing poverty and inequality remains to be seen.

([29]) In order to monitor in a timelier manner the effectiveness of social policies in the Member States, Eurostat, on the basis of statistical and econometric models, has produced experimental flash estimates for income reference year 2016. These complement the EU-SILC data and can be used in preliminary analysis until the final EU-SILC data becomes available. As any estimate, these flash estimates should be interpreted with caution – their accuracy depends on various factors therefore they cannot be expected to match perfectly EU-SILC 2017 results.

([30]) According to the benchmarking exercise in the area of unemployment benefits and active labour market policies conducted within the EMCO Committee. See the Draft Joint Employment Report 2018, European Commission, 2017 for details.

([31]) At 50 % of poverty threshold as demonstrated by benchmarking exercise of the Social Protection Committee in 2017.

Box 3.3.2: **Personal Income Tax reform in Estonia**

Previous Country Reports have flagged the relatively high tax wedge for low income earners in Estonia. In late 2016, the government adopted a package of measures in the area of taxation. Important changes were to be introduced in the personal income tax (PIT)([1]) by establishing tax progressivity in favour of low wage earners([2]). This box summarises the results of an ex-ante assessment of the macroeconomic impact of the PIT reform using the European Commission's QUEST model, and an assessment of distributional effects of the reform obtained using the EUROMOD methodology.

According to QUEST simulations([3]), the PIT reform will result in a 2 percentage points lower average labour tax rate on employees. This lower tax wedge will increase incentives to work, with the highest employment effects for the low- and medium skilled. The cumulative effect on employment for the five years following the reform is 0.7 % above the baseline scenario. The tax free allowance will increase disposable net incomes while reducing upward pressures on real gross wages. The upward effect on consumption is rather limited, as the boost to consumption coming from higher net incomes is countered by the rise in consumption taxes and inflation (consumption tax rises are technically included into the QUEST model because in reality the budgetary cost of the PIT reform was offset by various other tax rises). The cumulative effect of the reform on GDP is expected to be positive (0.4 % over the baseline in five years).

Table 1: **QUEST simulation results**

Years	1	2	3	4	5
GDP	0.10	0.21	0.29	0.34	0.36
Employment	0.20	0.43	0.56	0.63	0.65
- low skilled	0.32	0.69	0.92	1.03	1.08
- medium skilled	0.29	0.61	0.79	0.87	0.91
- high skilled	0.08	0.16	0.21	0.24	0.25
Real wages	-0.31	-0.54	-0.57	-0.54	-0.51
- low skilled	-0.41	-0.72	-0.79	-0.77	-0.74
- medium skilled	-0.38	-0.66	-0.69	-0.66	-0.63
- high skilled	-0.19	-0.32	-0.31	-0.27	-0.24
Consumption	0.05	0.07	0.14	0.19	0.22
Consumer prices, incl. VAT	0.88	0.76	0.69	0.65	0.63
Shock to average labour tax-rate on employees	-2.07	-2.07	-2.07	-2.07	-2.07

Comment: all figures express changes in percentages over the baseline; government balance figures are percentage points over the baseline.

EUROMOD simulations([4]) allow for examining the potential income-based and distributional effects of the reform. It is found that the PIT reform would only slightly reduce at-risk-of-poverty rates and income inequalities as measured by Gini coefficient([5]). In aggregate terms, four out of five households will be affected by the reform, and majority will be winners (71.6 %). Between 4th and 7th income decile most of the households will be winners (see Graph 1). The losers will be concentrated in the two top deciles, but there are also winners in the richest households, for example if the household is composed of both high and low income earners. There are relatively few winners in the lowest income quintiles because many of them depend on pensions or subsistence social benefits and are less affected by the PIT reform. Therefore, the reform will only have a limited impact on reducing poverty and income inequality for the very lowest income

groups.

Graph 1: **Share of affected households (winners and losers) by income**



Source: Joint Research Centre, calculations based on the EUROMOD model

Note: Affected households are those whose equalised disposable income changes with the reform; they are defined as winners, if their income increases, and losers if it decreases. Only changes above 1 EUR/month are considered.

([1]) Some other elements of the reform concern non-taxable pension, levels of social benefits, changes in the rules for submission of tax declarations, and other similar issues.

([2]) As of 2018, the following changes in the personal income taxes apply: (a) non-taxable income (also called 'tax free allowance') for low and medium wages to increase from 180 euro to 500 EUR/month; (b) for income 2 100 EUR/month and above, no tax free allowance; (c) for incomes above 1 200 EUR/month, tax free allowance will decrease gradually and reach zero at income 2100 euro/month; (d) the abolishment of Pensioners' tax allowance.

([3]) The simulation includes the changes to PIT, but since it was in reality offset by other tax rises in the budget, the model also includes rises to indirect/consumption taxes fully offsetting the PIT reform costs. This is a simplification of the actual taxation changes that came into force in 2018 (various excise rises, corporate income tax reform), given the limitations of the QUEST model.

([4]) EUROMOD analysis also includes simulation of the reintroduction of joint taxation and the additional allowance of 2 160 /year if joint annual income not above 50 400 EUR. The total size of the shock is 1.33 % of GDP.

([5]) The at-risk-of-poverty rate at 60 % of the national median income is reduced marginally by the reform from 21.4 % to 19.5 % of population. The at-risk-of-poverty rate is highest in households without children with one adult older than 65, standing at 75.9 %. The reform will reduce this to 72.5 %. The reform decreases slightly the Gini equalised disposable income from 0.33 to 0.32.

Pension adequacy

The government is taking steps to address risks to the future sustainability of the pension system. It plans to link the official retirement age to life expectancy from 2027. It also plans to abolish special pensions for members of the defence forces, prosecutors, police and border guard officials as well as special retirement regimes for workers in arduous or hazardous jobs from 2020. It is proposing to change how pensions are calculated to weaken the link between the statutory pension benefit and wage levels. If approved, the changes will be implemented over a transition period from 2020 to 2026. The draft legislation is expected in the first quarter of 2018. In October 2017, an additional annual allowance of EUR 115 was paid for the first time to pensioners who live alone. This reduced the relative poverty rate of these pensioners by 5.5 percentage points.

The Estonian pensioners' income level compared to their pre-retirement wage or average incomes in the country is lower than on average in the EU-28. Pensions currently amount to 45 % of late-career work income in Estonia, while in the EU it is 58 %([32]). The relative median disposable income of those aged 65 and above was 60 % of the income of those aged below 65 in 2016 –which is also among the lowest values in

([32]) Aggregate Replacement Ratio (ARR) indicator is defined as the ratio of the median individual gross pensions of 65-74 age category relative to median individual gross earnings of 50-59 age category, excluding other social benefits. EU aggregate figures are calculated as population-weighted averages of national values.

the EU-28([33]). Reflecting the relatively low pensions, Estonia has one of the highest rates of risk of poverty or social exclusion for older people (aged 65 years or over) in the EU (41.4 % versus the EU-28 average of 18.3 % in 2016). However, while the depth of poverty([34]) has increased in Estonia since 2013, it is still lower than in the EU on average. This is because the majority of pensioners with lower pensions still have incomes close to the relative poverty line. This also helps to limit the severe material deprivation rate([35]) of older people aged 65 or over, which is even slightly below the EU average (5.4 % in Estonia, 5.9 % in EU in 2016).

Ensuring adequate pensions in the future will remain a major challenge in Estonia, in particular for people with short professional careers or with low earnings, and for disabled people or those receiving only residence-based national pensions. Ageing population is a growing concern: the old-age dependency ratio (20-64) for Estonia is projected to rise by 29.1 percentage points (from 31.5 % in 2016 to 60.6 % in 2056) and it will be above the EU average (56.6 % in 2056) ([36]).

Social dialogue

Social partners' capacity to participate in policy making is improving. Government authorities engage social partners and other interest groups and the public in the decision-making process through an e-consultation system for a broad range of stakeholders. This in practice allows for active participation, although there are calls for a more formal tripartite consultation process. To improve the social partners' capacity to participate in policy making, a measure funded by EUR 470 000 from the European Social fund is being implemented. The activities supported are targeted towards improving social partners' analytical capabilities and the involvement of their members, and to strengthen their internal structure.

3.3.3. HEALTHCARE

The health status of Estonian people is improving but some challenges remain. Life expectancy in Estonia is increasing and child mortality is falling, rapidly closing the gap with the respective EU averages. However, healthy life expectancy, preventable mortality and mortality from cardiovascular disease and cancer in Estonia are worse than the EU average. This limits people's ability to work and their productivity.

The number of registered work accidents has increased, reaching a 20-year peak in 2016. The rate of both work accidents and fatal work accidents per 100 000 employees grew in 1 year from 2015([37]). A large proportion of work accidents involve people who have been employed for less than 1 year. The government proposes to amend the Occupational Health and Work Safety Act from 2019. The revised Act is expected to make workers' health checks work oriented, improve protection against direct health hazards in the workplace and ensure safety instructions and the provision of first aid training are adapted to the specificities of the company. These changes are intended to improve occupational health - make the existing rules clearer and lower the administrative burden on employers while increasing safety in the workplaces. The impact of these changes on lowering health-related exits from work remains to be seen.

Access to health care is a challenge. In 2015, 12.7 % of all Estonians reported an unmet need for medical care, the highest rate in the EU (discussed in OECD/European Observatory on Health Systems and Policies 2017). Access to specialised medical care is problematic not because of high costs but rather due to waiting times. Analysis of patient pathways — the route patients follow from their first contact with a healthcare professional

([33]) Relative median disposable income indicator is defined as the ratio of the median equivalised disposable income of persons aged 60 and over to the median equivalised disposable income of persons aged between 0 and 59. It takes into consideration all incomes.

([34]) Measured by the poverty gap, indicating the extent to which the incomes of those below the poverty line fall short of that poverty line.

([35]) Severe Material Deprivation (SMD) is defined as the enforced inability to pay for at least four of the deprivation items: (1) pay rent/mortgage utility bills in time; (2) keep home adequately warm; (3) meet unexpected expenses; (4) eat meat, fish or a protein equivalent every second day; (5) one week holiday away from home; (6) own a car; (7) a washing machine; (8) a colour TV; (9) a telephone.

([36]) People aged 65 or above relative to the population aged 20-64, The 2018 Ageing Report

([37]) The number of fatal work accidents for the 15–74 age group was 788.

through to the completion of their treatment — points to problems with care coordination and misaligned incentives in primary care. Some 6 % of the population have no insurance coverage. The government is taking steps to ease the burden of out-of-pocket payments, such as re-establishing benefits for dental care for adults. The government is also conducting an analysis on the burden of out-of-pocket payments.

The number of people affected by non-communicable diseases is increasing and poses challenges to health services. Attention is paid to improving the quality and integration of health services through the introduction of a quality bonus system in primary care, an e-consultation system and various quality assurance mechanisms. However, a large proportion of acute in-patient care can be avoided and the share of hospital stays and ambulatory specialist visits can be reduced, according to the World Bank (2015). Primary care capacity and its coordination role are being strengthened by the creation of multi-disciplinary health centres. This reform is being financed with help from the European Regional Development Fund. Estonia also faces a shortage of nurses, which risks jeopardising the success of plans for integrating care and for better management of chronic diseases.

The provision of long-term care for the older people with deteriorating health conditions does not match the needs of the population. Rising long-term care needs and costs are fuelled by the rapid ageing of the population. By 2030 a quarter of the population will be over 65 and more than 7 % over 80. Most older people finance social services from their state-provided pension which is often not sufficient to cover the costs of even the least-expensive general care home([38]). The cost of round-the-clock care in homes was mostly between EUR 400 and 600 a month in 2016 but could also be as high as EUR 800-1 200 a month. In comparison the average old-age pension was only EUR 386. The increase of previously very low minimum hourly wages of nurses and carers by 5.4 % to 13.6 % is expected to further increase the financial burden on people in care homes in 2018.

Assuring the long-term stability of health care financing is a considerable challenge; even though improvements are planned. Estonia spends less on health than the EU average, making the sustainability of healthcare financing vulnerable to economic shocks and the ageing of the population. The long-term forecast model([39]) shows that the long-term costs are higher than revenues and that the reserves of the Estonian Health Insurance Fund (EHIF) will run out in 2021. In September 2017, the government decided to increase the funding for the health care system by EUR 300 million over the next 5 years by making contributions to EHIF for non-working pensioners. This will broaden the health system's revenue base beyond social tax alone and relieve pressure on EHIF's reserves.

3.3.4. EDUCATION AND SKILLS

Future workers (today's 15-year-olds) achieve a high level of basic skills but some challenges remain. The 2015 PISA tests show that the number of top performing students who demonstrate the ability to solve complex problems outnumber those who fail to reach a minimum level of skills in science, reading and mathematics. However, the performance gap between students of Estonian and Russian mother tongue remains important. In 2016, only 61 % of Russian-medium basic schools graduates achieved the required intermediate level in Estonian language (B1), (target 90 %). There was an improvement in the proportion of students who reached the B2 level required at the end of upper secondary (83 % in 2016). Student demographics raise efficiency challenges and the need to further strengthen the coordination of resources and responsibilities at different levels of education([40]).

Early school leaving remains high. Although early school leaving is around the EU average it has not decreased consistently over recent years.

([38]) Wold Bank. Reducing the Burden of Care in Estonia, June 2017, https://riigikantselei.ee/sites/default/files/content-editors/Failid/hoolduskoormus/estonia_ltc_report_final.pdf

([39]) Kruus, P., Soe R.-M., Võrk, A., Jüri. L. (2014). Ravikindlustuse jätkusuutlikkuse prognoos (Health insurance sustainability forecast). Tallinn: Praxis. http://www.praxis.ee/wp-content/uploads/2014/02/Ravikindlustuse-j%C3%A4tkusuutlikkuse-prognoos-09.04.pdf

([40]) (European Commission 2017, Education and Training Monitor: Estonia https://ec.europa.eu/education/sites/education/files/monitor2017-ee_en.pdf).

The gender gap remains significant. Dropout rates in the first year of upper secondary vocational education and training (VET) have fallen but remain high (22.4 % in 2017). Authorities are exploring options to raise the age of compulsory schooling to reduce the proportion of low-skilled people.

While participation in adult learning in Estonia has improved, reaching groups that are difficult to engage in learning and up-skilling remains a challenge. Following the Council of the EU's December 2016 Recommendation on Upskilling Pathways recommendation([41]), attention is being given to bringing low-skilled adults back into formal education. The aim is to improve their qualifications or give them training in key competences. The 2017-2020 adult education programme prioritises the following key competences: digital skills, learning skills, social skills and entrepreneurship, and national and foreign language skills. For 2017-2020 more than EUR 30 million of European Social Fund (ESF) financing has been allocated providing training free of charge. The aim is to train at least 50 000 adults.

The employment rate for recent vocational education and training (VET) graduates remains high and challenges in the area are being addressed. The employment rate of recent graduates (82.1 % in 2016) was well above the EU-average of 75 %. The main challenges in VET include: the low level of participation in apprenticeship training, the high level of dropout from initial VET programmes, and skills mismatches. The ESF funded projects are used to increase the low level of participation in work-based learning, etc. They are doing so by supporting the first groups of apprentices in upper secondary VET (study length 3.5 years) and piloting apprenticeship training in higher education (study length 3 to 4 years). From 2018, professional standards will be renewed which would lead to a better match between skills taught in VET and labour market needs. Performance-linked funding will be introduced which will focus on students' completion of studies in the nominal time, success in professional examinations and participation in apprenticeship training.

Increasing the attractiveness of the teaching profession remains critical. Almost half of the Estonian teachers are aged over 50. To make the profession more attractive, measures to raise teachers' salaries have continued, with increases in the minimum salary, especially for pre-school teachers. In 2017, universities revised admission requirements for teacher education programmes in order to engage more motivated students. However, measures to make university teaching more attractive have been rather slow.

Tertiary attainment is high, but high dropout and the gender imbalance remain problematic. In 2016, tertiary attainment was above the EU average of 39.1 %. 52 % of women aged 30-34 have a tertiary degree, compared to 38.8 % of men of the same age. The government targets the completion of studies in nominal time and the revised funding model seeks to address the high dropout rate. The recommendations of OSKA (the labour market and skills survey system (European Commission, 2017)) have been embedded in the performance agreements and are expected to be monitored when assessing the fulfilment of the agreements.

The transition from higher education to work raises some challenges. There is evidence of skill mismatch in some economic sectors due to inadequate supply. Although graduates in natural sciences appear to have a good level of skills, there is no clear demand for them in the labour market ([42]). Apprenticeship training has been piloted in higher education since autumn 2017. The level of doctoral allowance has been increased by 50 % from 2018 in order to reduce the dropout rate. But overall the motivation and attractiveness of obtaining a PhD are rather limited. Completing doctoral studies is challenging for students who do paid work at the same time. An additional challenge is that the overall number of students continues to fall due to demographic trends.

([41]) OJ C 484/01, 24.12.2016

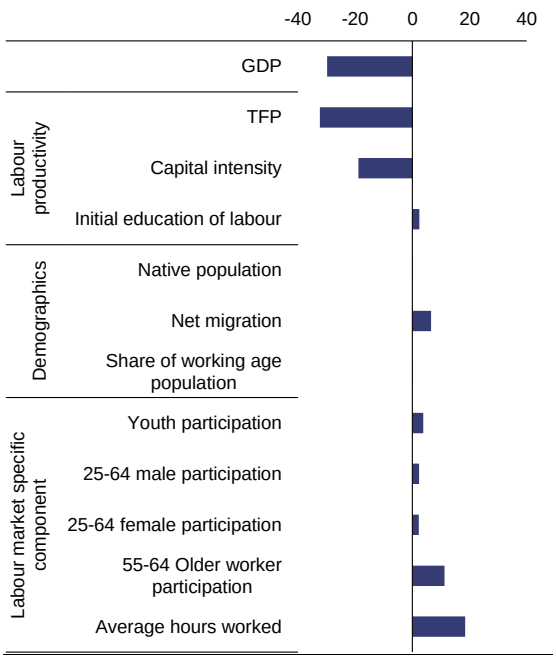
([42]) Annual analysis by the Ministry of Education and Research 2017, Summary https://www.hm.ee/sites/default/files/uuringud/htmannualanalyses2017summary_en.pdf

3.4. INVESTMENT

3.4.1. GDP CONVERGENCE AND INVESTMENT

Per capita income in Estonia is about 30 % below the euro area average (See Graphs 3.4.1 and 3.4.2**).** While labour participation is much higher than the EU average, labour productivity is much lower.

Graph 3.4.1: **Breakdown of the gap with the Euro Area**

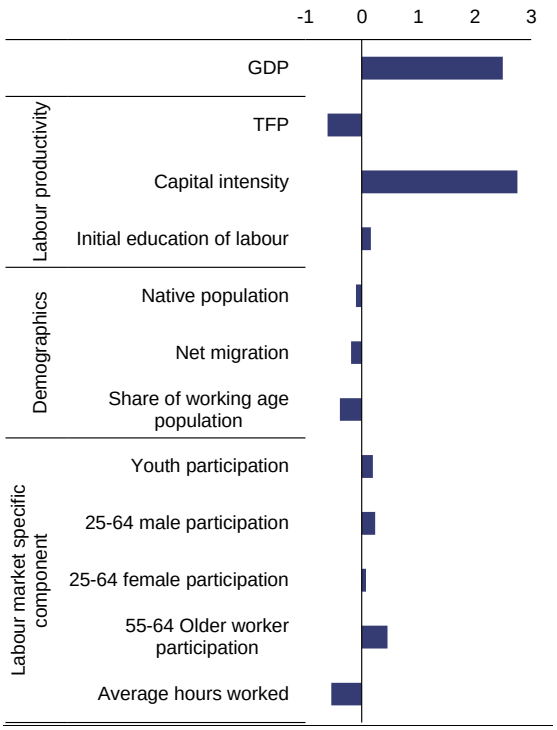


This figure shows the gap in GDP per capita with the EA19 in 2016 and its breakdown. The horizontal axis shows the percentage gap to the EA19 level. The breakdown is done in two steps. First, the GDP per capita gap is broken down into contributions from demographic components, labour market components and labour productivity. In the second step, each of these is further broken down into a number of more refined components. The other two panels follow the same approach. The next panel depicts the contributions of these groups of components to the absolute annual GDP growth between 2005 and 2016. Hence, the horizontal axis shows percentage point contributions to the absolute growth. The third panel also provides the breakdown of growth in GDP but in relation to the EA19. The horizontal axis shows by how many percentage points each component contributed more/less to growth than in the EA19.
Source: European Commission

The main driver of Estonia's GDP growth in 2005-2016 has been capital deepening([43]), which averaged almost 3 % a year. The high rates of people participating in the labour market also contributed. However, in contrast to most other European countries, the falling proportion of the working-age population and net outward migration restricted growth in 2005-2016.

([43]) Capital deepening is the increase in capital per worker.

Graph 3.4.2: **Breakdown of absolute growth in Estonia, 2005-2016**



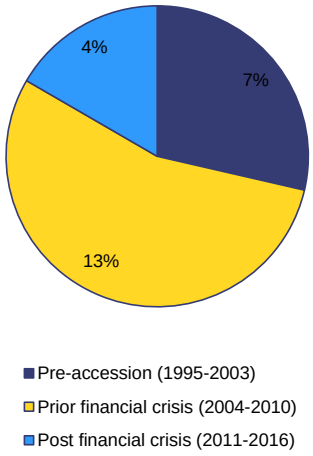
Source: European Commission

Investment was the key driver of economic convergence with the EU average and helped to close the gap in capital intensity. However, the strong overall performance over the last decade ([44]) masks differences in investment before and after the financial crisis. For example, the inflow of net foreign direct investment, which facilitates technology transfers, peaked at 22 % of GDP in 2005 and has moderated significantly since 2011 to above 5 % on average (see Graph 3.4.3).

Today, the Estonian economy remains 20 % under-capitalised compared to the EU average, partly due to the differences in relative prices of labour and capital inputs, partly due to the sectoral composition (see Section 3.4.2). The gap in total factor productivity is about 30 %. Hence, Estonia's convergence challenge is to use its scarce human capital more productively while finding ways to increasing both the active population and the capital/labour ratio in the medium term.

([44]) Capital intensity increased on average 2 percentage points faster in Estonia than in the Euro Area in 2005-2016.

Graph 3.4.3: **Foreign direct investment, sum of net inflows (% of GDP)**



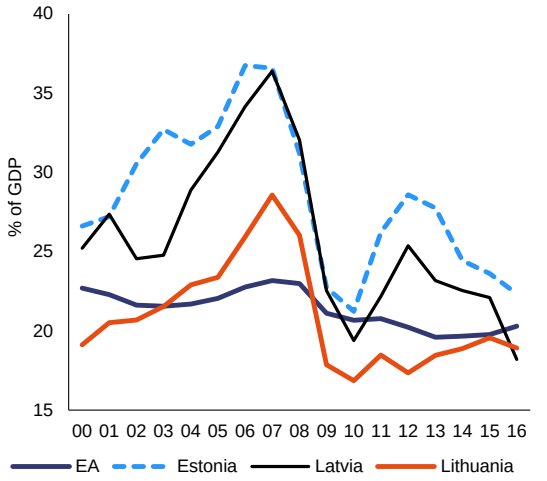
Source: IMF, European Commission

3.4.2. OVERVIEW OF INVESTMENT DEVELOPMENTS

As in the other Baltic states, the investment rate in Estonia remained above 20 %, a few percentage points above the EU average, in 2011-2016. However, the investment rate has declined significantly from the pre-crisis years when it was above 30 % (see Graph 3.4.4). This partly reflects the adjustment that has followed the period of overheating, and can signal the gradual maturing of the economy, but it may also indicate the existence of investment bottlenecks that hinder competitiveness in the long run (see box 3.4.1). The following analysis focuses on the assessment of relevance of such potential bottlenecks.

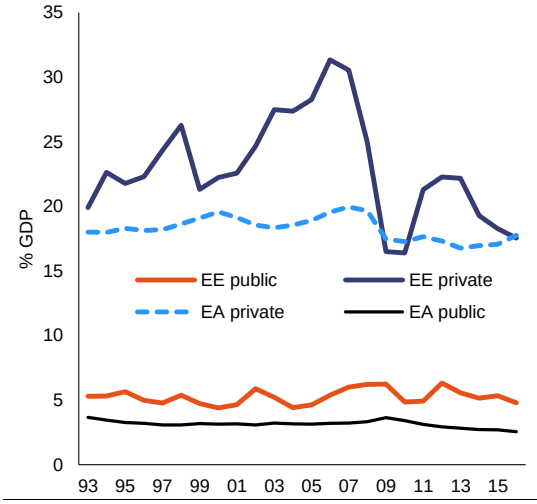
Estonia's private investment rate has been about four times above the rate of public investment, suggesting that there is no crowding out effect. Indeed, both investment rates have been higher on average than the corresponding indicators for the euro area (see Graph 3.4.5). In Estonia, public investment has one of the highest shares in GDP in the EU (see graph 3.4.5) where EU funds have played an important role amounting to a significant share of public investment. This dependency on EU funds was identified as a risk, and the Estonian government launched a taskforce to consider how its investment policy can be sustained taking into account the allocations under the next EU multiannual financial framework.

Graph 3.4.4: **Investment rates (total)**



Source: Eurostat

Graph 3.4.5: **Investment rates (public and private)**



Source: European Commission

Estonian manufacturing industry has been specialised in four areas: wood and paper; ICT and electrical equipment; food and beverages; and manufacture of fabricated metal. Together, these four sectors have accounted for around two thirds of manufacturing output and exports and for about the same share of the total employment in manufacturing industries. According to Statistics Estonia data, labour productivity per person employed is the highest in ICT companies. However, as a share of value added, wood

manufacturing is more significant as it accounts for a quarter of the value added, while ICT only accounts for 11 %.

This relative specialisation in the Estonian manufacturing industries has changed very little since 2005 and consequently, the share of investment in technology-intensive assets in GDP remains below the EU average. The share has increased recently, mostly on the account of the share of investment in information and communications technology equipment, which in the last decade has been twice as high in Estonia (1.5 % of GDP) as in the EU. At the same time, investment in intellectual property products as a share of GDP increased broadly in line with the EU average but from a lower level (Graph 3.4.6). It reached 2.5 % of GDP in 2016 in Estonia, against 4 % in the EU. As convergence progresses and earlier investments start bearing fruit, it is reasonable to expect the share of investments in intellectual property products to become bigger as economy structure shifts towards more knowledge- and technology intensive activities.

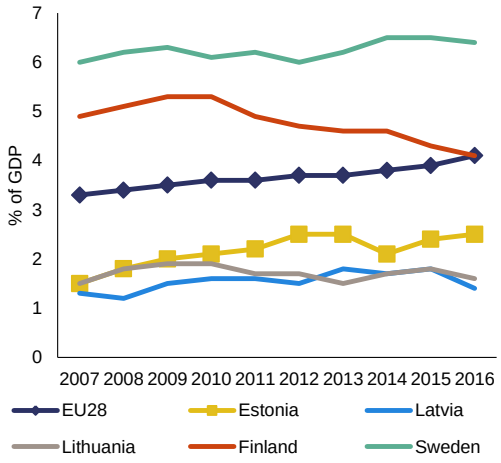
3.4.3. INVESTMENT CONDITIONS

Estonia's financing conditions remain rather favourable (see Section 3.2). Several institutions support access to finance for companies, including for SMEs and those needing funding for innovation and exports. Alternative ways of raising capital, such as crowd financing, are also used in Estonia. A lot of investment is supported by various EU initiatives, such as the European Fund for Strategic Investments.

Labour market regulation seems to be conducive to investment but negative demographic developments are a strain. Estonia's labour market policy performs well in terms of activity and employment rates compared to the EU average (see Section 3.3). Employment protection legislation in Estonia does not seem to unduly hinder business competitiveness, and there is no labour market segmentation between temporary and permanent employment contracts. The recent Work Ability reform has removed major disincentives to work, and though it is still being implemented its impact is already visible in data showing an increase in activity. According to a recent Eurobarometer survey, a majority of Estonian firms do not consider labour legislation an obstacle to their business activity European Commission, 2017c).

Estonia has a business-friendly regulatory landscape and scores highly in many international competitiveness rankings (World Bank, 2016) ([45]). This is particularly important considering Estonia's business demographics([46]) and the need to maintain cost competitiveness. The areas where there are no particular problems for doing business include creating a business, compliance costs and dealing with public administration. This performance reflects Estonia's investments in e-government and in public sector efficiency. Consequently, net business population growth in Estonia is well above the EU average([47]). The survival rate of Estonian firms after the fifth year (49 %) is also relatively high, outperforming most countries in central and Eastern Europe.

Graph 3.4.6: **Investment in intellectual property products**



Source: European Commission

([45]) Estonia ranks 12th out of 190 economies.
([46]) More than 90 % of firms in Estonia are micro enterprises. SMEs account for almost 76 % of value added and roughly 78 % of employment in the country.
([47]) In 2015 the net business population growth in Estonia was 2.85 %, against 1 % for the EU.

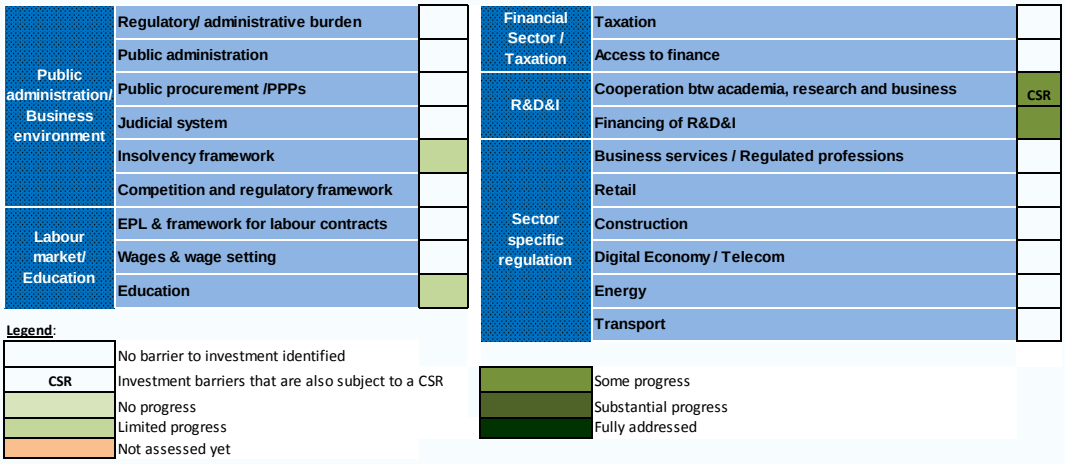
Box 3.4.1: Investment challenges and reforms in Estonia

Macroeconomic perspective

Estonia's ratio of investment to GDP is above the EU average, but it has trended down over recent years compared to pre-crisis levels. While investments picked up strongly in 2017, capital intensity's contribution to GDP per capita in Estonia was about 20 % below the level in the euro area average in 2016 (see Section 3.4.1). The rise in investments in 2017 was due to a peak in the EU funds absorption cycle. Estonia invests more than the EU average in 'other construction' and 'machinery and equipment'. Estonia invests 40 % less than the EU average in the 'other' category, which includes investment in intangible assets.

Structural barriers to investment

Some barriers to investment were identified in Estonia, as outlined in the table below:



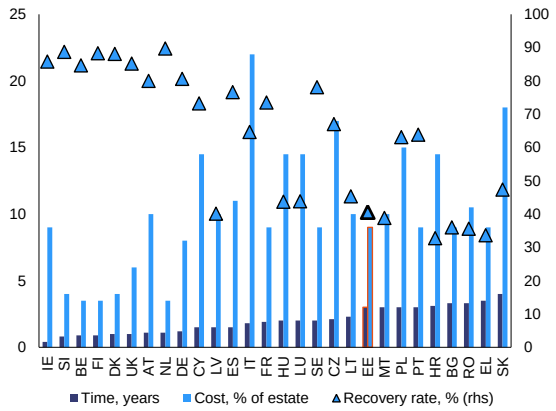
1) *Labour and skill shortages* are considered a barrier to higher investment in fast growing sectors. Shortages of certain skill types (IT skills) are more acute in a few sectors, for example in ICT (see Section 3.3.4). Estonia is taking holistic approach to close the skills gaps and address the structural shortages in labour supply. These are all steps in the right direction but their impact has been limited.

2) Investment in activities with higher value added remains an issue. The Commission analysis on investment barriers highlighted *limited cooperation between businesses and academia* and *low RDI private investment*. Estonia introduced measures to address these issues, but their effectiveness cannot yet be assessed (see Section 3.5.1).

3) The Commission analysis highlighted the *lengthy insolvency procedures* as an institutional barrier that might hamper investment. The review of the insolvency framework is under way, including a complementary project related to early warning and pre-insolvency (see Section 3.4.3).

Lengthy insolvency procedures hinder the efficient reallocation of resources. Estonia's insolvency framework is relatively strong, but insolvency procedures are lengthy and cumbersome, and this has been identified as a weakness. Lack of early intervention, notably by creditors, results in a low recovery rate and slows down the reallocation of resources and business dynamism. The lack of national rules and procedures for companies to directly transfer their registered offices into and out of Estonia weakens the business environment.

Graph 3.4.7: **Resolving insolvency indicators**



Source: World Bank

Estonia is a leader in applying e-procurement solutions but the strategic use of tendering procedures is still limited. Estonia is actively using e-procurement and plans to integrate the European Single Procurement Document into the national system. However, the use of quality criteria for evaluating public tenders is still scarce. The main award criterion in about 76 % of public procurement procedures remains the lowest price rather than quality or innovation (European Commission, 2018a).

Measures have been taken to strengthen the Estonian start-up ecosystem. The government introduced a new visa programme for non-EU entrepreneurs who wish to establish their start-up company in the country. The visa can be issued for up to one year and extended for up to 6 months. Those who want to stay longer can apply for a temporary residence permit for entrepreneurship. The visa can also be used by Estonian start-ups to attract and employ foreign talent thus limiting the impact of labour shortages in some sectors.

3.4.4. PRODUCTIVITY AND LABOUR COST DEVELOPMENTS

Structural and cyclical factors continue to push wages up. The favourable economic outlook combined with the tightening of the labour market and the minimum wage hikes of the last years have put constant pressure on nominal wages. Since 2012, this has accelerated the growth rate of the compensation of employee beyond that of productivity leading to increasing nominal unit labour cost. Moreover, since 2012, nominal wage growth has been above the rates that would be consistent both with internal labour market conditions and with a stable evolution of cost competitiveness (Graph 3.4.8).

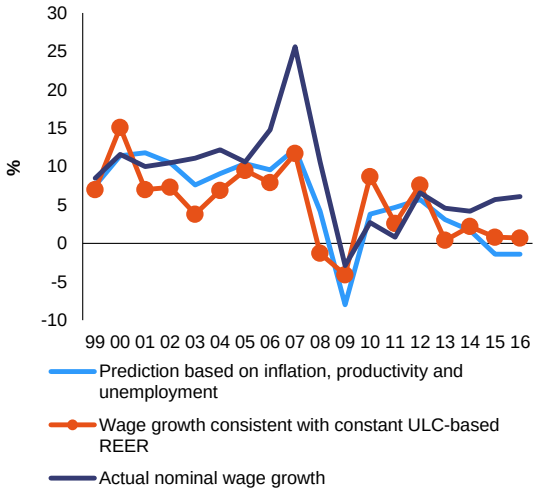
Real wage growth in Estonia is partly driven by a catching-up process. Starting from a relatively low wage level, Estonia is one of the countries (together with the other Baltic States, Bulgaria and Romania), which have witnessed rapid real wage growth since 2000 that can be attributed in part to convergence with the other EU economies. In the first half of 2017 the growth in productivity exceeded that in real wages for the first time in several years.

Overall, the rise in unit labour costs has so far not significantly hit exports. Exports have expanded in line with global demand over recent years. In industries where Estonia is a price-taker, labour cost hikes have been absorbed to some extent by reducing profits and by the favourable price developments in the export markets. In industries where Estonia has gained market share in technology-intensive niche markets([48]), it has gained an advantage. Sustaining that advantage will not be possible without further investments in R&D and in human capital to ensure that labour productivity and competitiveness are increasing.

The full effect of ageing will kick in more strongly over the coming year. Most likely, it will exert an upward pressure on wages. A continuous rise in unit labour costs over the coming years can have more visible negative effects on the economy.

([48]) A study recently conducted by the Ministry of Economic Affairs and Communications found that the GDP contributions generated by exports can vary significantly depending on the amounts of imported intermediates and the added value created in the country. Statistics many not fully accurately account for the technology used.

Graph 3.4.8: **Nominal wage growth in Estonia in comparison with wage benchmarks**



Nominal wage growth is increasing faster than predicted by two different benchmark models taking into account fundamental developments (e.g. inflation, productivity, unit labour costs, real economic exchange rate etc.).
Source: Update of Arpaia and Kiss (2015)

3.5. SECTORAL POLICIES

3.5.1. R&D AND INNOVATION

The full potential of Estonia's research and innovation (R&I) system remains underused. The country has implemented several measures to boost the growth of the knowledge economy, but the challenge is to maximise their impact. There is a good variety of higher education, research and technology-enabling institutions and infrastructure in place([49]). However, weak links between business and science, low private investment in R&D, the quality of scientific output and the supply of human capital and skills are key bottlenecks to expanding Estonia's innovation capacity.

Supported by EU funds, Estonia's public R&D intensity, at 0.6 % of GDP, has been generally above the EU average. The government has increased the national budget for R&D in recent years, a trend that will continue in 2018. However, 50 % of government R&D expenditure comes from the EU's Structural Funds([50]) and this dependence may become vulnerability in the future.

Estonia is a 'moderate innovator' with an innovation performance that has recently worsened compared to its EU peers([51]). This decline is due to the low share of innovative SMEs and decreasing academia-business and business-to-business links. Estonia's relative strengths are in public investment in R&I, tertiary education attainment and an innovation-friendly environment (see Section 3.4.3.).

Estonia benefits from an open public R&I system, but the system's efficiency seems to be an issue, at least in the short term. Estonia performs strongly on international cooperation ([52]), and the number of foreign doctoral students more than tripled between 2008 and 2017 to 17.1 %. However, the quality of its scientific outputs as measured by the most-cited publications is low([53]) (see Graph 3.5.1). Since 2016, the ASTRA programme([54]) is supporting the evaluation and rationalisation of financing for the public R&I system through, for example, several mergers of higher education and research institutions([55]).In terms of funding, in 2017 over EUR 22 million were earmarked to strengthen higher education and research institutions. Over the following years, research institutions will have received an additional EUR 16.9 million for non-competitive funding to reduce their current overdependence on competitive grants versus basic funding for research and higher education institutions, and to improve the longer-term sustainability of the R&D system.

The shortage of people involved in R&I is a cause of major concern. The number of new doctorates and graduates in science and engineering has decreased since 2013 to below the EU average([56]), which is worrisome. The government has put in place several measures to improve the working conditions of researchers, promote research careers and attract foreign talent ([57]).In addition, Estonia is increasingly using funding from the European Strategic Investment Fund to strengthen its human capital (See box 2.1).

([49]) Estonia has 7 universities, 4 private R&D institutions and 11 public research organisations. In addition, there are 3 Science and Technology Parks, 6 competence centres, and 22 technology clusters at different level of maturity.

([50]) Estonia's R&I strategy for 2014-2020 states that Structural Funds will be used particularly to implement structural change. By contrast, the activities that require continuous financing (such as the operating cost of R&D institutions) are being financed from state revenue.

([51]) See the European Innovation Scoreboard.

([52]) e.g Estonia ranks sixth in the EU on international scientific co-publications.

([53]) Estonia is 19th in the EU in terms of number of scientific publications ranked among the top 10% most-cited worldwide publications, but it is 12th in terms of public R&D spending as a percentage of GDP.

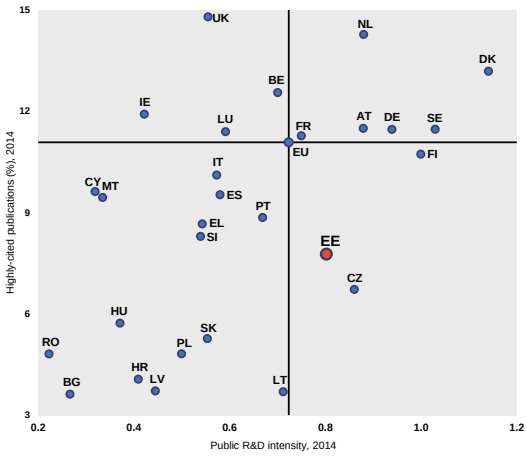
([54]) ASTRA is the institutional development programme for R&D institutions and higher education institutions.

([55]) Some examples of mergers in 2017: i) The Estonian Biocentre (EBC) became part of Tartu University; ii) Tallinn University of Technology and IT College merged.

([56]) The number of new doctoral graduates per thousand people aged 25-34 decreased from 1.13 in 2014 to 1.09 in 2015. The corresponding figure for new graduates in science and engineering declined from 15.7 in 2013 to 14.5 in 2015.

([57]) Thirteen high-level researchers have been attracted to Estonia through the Mobilitas Pluss Top Researcher grants.

Graph 3.5.1: **Highly-cited publications(*)**

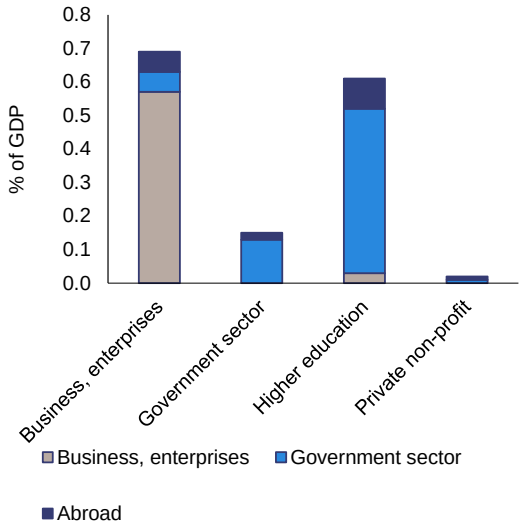


* Scientific publications within the 10 % most-cited scientific publications worldwide as % of total scientific publications of the country, versus public R&D intensity (government expenditure on R&D plus higher education sector expenditure on R&D as % of GDP).
Source: European Commission

With less than 0.5 % of Estonian companies reporting research activities in 2016, private R&D intensity is only 0.7 % of GDP — half the EU average of 1.3 %. The low level of R&D conducted by businesses may reflect the low share of high technology and knowledge-intensive companies in the economy. The highest expenditure on R&D comes from the ICT, manufacturing and energy sectors. Some of these sectors have increased investment in R&D: manufacturing by 39 %, electronic products and equipment by 80 % and services by 13 % from 2014 to 2015([58]). To leverage business R&D investments and upgrade the technological capacity of the Estonian economy, the government provides support for businesses to participate in technology development centres and clusters. It also provides support for promoting investment in technology (with a budget of EUR 3 million). In addition, the 'ADAPTER' platform supports Estonian firms engaging in research projects with universities. Fourteen projects have been signed since its launch in 2016.

The mismatch between the needs of the business sector and the limited provision of knowledge from the public research system continues to hamper Estonia's innovation capacity. Estonia's performance on academia-business cooperation remains weak and is well below the EU average([59]). The NUTIKAS programme was launched in 2015 to raise the capabilities of firms to carry out applied research. It aims to involve 200 companies by 2023. Although interest appears to be growing among businesses, only 21 companies received a grant in 2017. Use of other measures, such as support for public procurement, is also picking up slowly.

Graph 3.5.2: **R&D expenditure and sector of performance and source of funds (2015)**



Source: European Commission (Eurostat)
Bars indicate the sector of performance and the colours – the source of funding.

Insufficient prioritisation of public R&D and innovation investment remains a challenge. Estonia has made some progress in re-launching the process of identifying and refining its specific competitive advantages and facilitating market opportunities in international value chains. The eventual aim of the process is to match the public R&D and innovation investment better with these advantages and opportunities. The country would benefit from a sustained effort to implement and refine its 'smart specialisation' approach, which aims at the continuous transformation of its

([58]) 2015 OECD ANBERD indicator: business enterprise R&D broken down by industry.

([59]) Public expenditure on R&D financed by domestic businesses represents 0.036 % of GDP in Estonia, compared with an EU average of 0.052 %. In addition, with 0.1 % of public-private scientific co-publications as a % of the total number of publications in 2015, Estonia is well below the EU average of 2.8 %.

productive structures through research and innovation.

3.5.2. DIGITAL ECONOMY AND SOCIETY

The rapid uptake of digital technology by the public sector continues. Estonia is one of the most advanced countries in Europe in the adoption of digital technologies by the government. According to the Digital Scoreboard (European Commission, 2018a), it is the best performer in digital public services and e-government. It scores above the EU average on the public's digital skills and use of the internet. Estonia has been at the forefront of online public services for several years. Remarkably, the proportion of e-government users, at 78 %, is more than double the EU average (see box 3.5.1).

On the other hand, the private sector is performing less well and the digitalisation of companies is one of the key challenges. Despite there being some very dynamic start-ups, the traditional economic sectors are not making the most of the opportunities of a digital business model. One of the reasons is the difficulty they face in recruiting people with appropriate digital skills. Estonian companies are lagging behind in the use of ICT. This is reflected in the proportion of firms whose business processes are automatically linked to those of their suppliers and/or customers, the proportion of company turnover from e-commerce and the percentage of firms with broadband access. However, SMEs have made some significant progress. The proportion of SMEs selling online is increasing and e-commerce turnover is above the EU average (10.7 % against 9.4 %), although there are still only a few selling online across Estonia's borders.

Some progress has been achieved on digital infrastructure. The proportion of households covered by fixed broadband (at 91 %) has improved but is still well below the EU average (98 %). At present only one third of the internet subscriptions is to fast broadband, compared with 37 % at EU level. This mainly illustrates the urban-rural digital divide. The lack of fixed broadband coverage in rural areas is being tackled through the EstWin project. This aims to build a total of 6 600 km of backhaul networks in rural areas by 2018. Once completed, 98 % of all households, businesses and institutions in Estonia should be located no further than 1.5 km from the nearest network access point.

Estonia has put in place measures to facilitate use of the collaborative economy, starting with the transport sector. A draft new law intends to lower the administrative burden for mediating platforms. Furthermore, the Estonian authorities have struck cooperation agreements with platforms to facilitate and simplify the income tax declaration for drivers and collection of the tax from them. With the drivers' consent, platforms send electronically related data to the tax authorities to minimise administrative burden for the drivers([60]). It will also be possible for service providers to open a special business account in a bank from which the relevant contributions would be automatically transferred to the tax authorities. According to 2017 Eurostat survey results, 20 % of Estonians booked transport services from another private individual online, which is one of the highest shares in the EU.

3.5.3. ENERGY, CLIMATE AND ENVIRONMENT

Estonia has a relatively high share of solid fuels in its energy mix due to domestically mind oil shale ([61]) which is used for producing shale oil and electricity. Consequently, it has a very low import dependency and the second most energy-intensive economy in the EU. The share of renewable energy in gross inland consumption is 28.8 %, putting Estonia already above its 25 % target for 2020, mainly due to its use of biomass for electricity and heating.

Estonia is well on track to meet its 2020 greenhouse gas emission reduction target. It has decided to reduce greenhouse gas emissions by 70 % by 2030, to increase renewable energy production to 50 % of final energy consumption and to maintain final energy consumption at the 2010 level.

([60]) Study on passenger transport by taxi, hire car with driver and ridesharing in the EU, 2016, Annex III, available at https://ec.europa.eu/transport/modes/road/studies/road_en, see page 230.

([61]) See e.g. OECD Environmental Performance Reviews: Estonia 2017.

Box 3.5.1: **Policy highlights: e-governance**

Estonia has been at the forefront of online public services for a few years and it has probably the most joined up digital government in the world. Its use of ICT in public sector allows 99% of the public services to be available online 24/7. ([1])

The success in converting public services online is mainly based on the widespread use of electronic identification cards and the creation of a digital information infrastructure: the X-Road a secure internet data exchange layer that allows decentralised databases and information systems to communicate with each other. X-Road parties share information to produce services that people can access with their e-ID.

The flexibility provided by this open set-up has allowed new components to be added over the years. The system is fed with information from both public (i.e. population register, health insurance register, vehicle register, etc.) and private sector (mainly energy, telecom and banks) and allows the Estonians to exploit services including i-voting, tax filling, online medical prescriptions but also signing a binding contract or opening a bank account via mobile phone from anywhere in the world.

After a slow start, as for many technological innovations, the diffusion of the use of ID-card has increased over time to get to more than 80 million usages in 2014 (an average annual increase of about 7.4 million authentications, and about 3.5 million signatures). The system total number of services offered through the X-Road has also widespread to 1600 from 40 in 2003.

On top of the easy availability of the services, the process implies efficiency improvements that allows for large gains in terms of money and time saved by the users as well as public officials. For example, filling a tax declaration takes 5 minutes and a refund is issued within a maximum of 5 working days for non-problematic tax returns (compared to 3 to 6 months for paper declaration). Not surprising 95% of income taxes are provided online.

More in general, the World Bank has quantified the time savings coming from the adoption of the X-Road into an impressive 2.8 million total hours for 2014, or 3225 years. Other ways stated the productivity gain from the eGovernment is equivalent to 3225 people working 24/7 for a whole year. ([2])

([1]) See https://e-estonia.com/solutions/e-governance/state-e-services-portal/

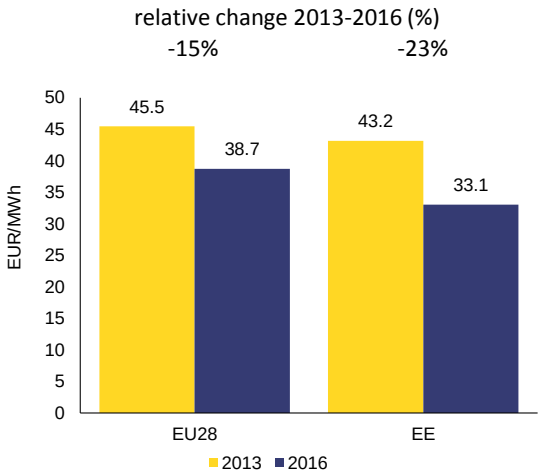
([2]) See WB (2016) Estonian e-Government Ecosystem: Foundation, Applications, Outcomes background paper to the world development repost 2016: Digital dividends. The estimate reflects a resident- government interaction that would have taken 15 minutes (conservative assumption) if made in person. By varying the pre-query threshold (from 5 minute to an hour), the time savings ranges from about 1000 to 12000 years.

Estonia's energy efficiency is improving but there remains major energy-saving potential, particularly in the residential and energy distribution sectors. According to the Energy Union factsheet, Estonia has achieved its national energy efficiency targets. It has made some progress on a number of legislative initiatives to improve energy efficiency. Public subsidy schemes are currently being developed, including a new scheme to subsidise the renovation of district heating systems. Support projects include the renovation of district heating distribution networks and facilities all over Estonia. Energy communities in Estonia can play a major role in helping achieve its national energy efficiency targets.

The completion of key electricity infrastructure projects in the Baltic states has brought the region lower prices and better security of supply. As part of the implementation of the Baltic Energy Market Interconnection Plan a number of cross-border and domestic infrastructure projects have been completed across the Baltic states, essentially integrating them with the Nordic electricity market (European Commission, 2017).. The increased capacity of the Estonia-Latvia interconnection will benefit the electricity markets of Estonia and the other Baltic states alike. Synchronising their grids with continental Europe is a common strategic goal of all three Baltic states. The main aim of the synchronisation is to increase the security of supply and contribute to achieving a fully integrated internal energy market.

Implementing the project will be the region's biggest challenge in the area of energy in the coming years.

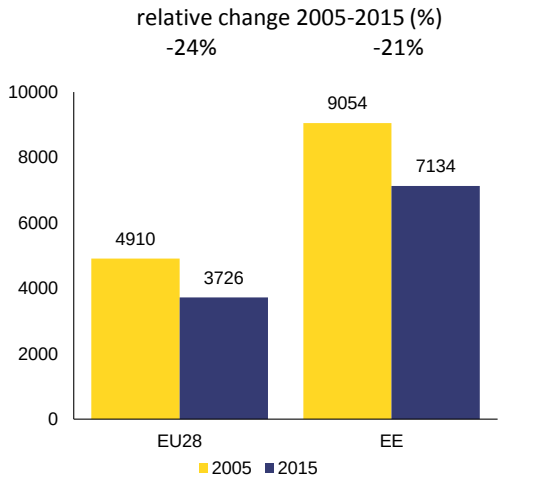
Graph 3.5.3: **Wholesale electricity prices**



Source: EC Commission, based on Platts and European power exchanges

Progress in developing a regional natural gas market has been slower than for electricity. Wholesale gas prices in Estonia have declined in the last few years but remain higher than EU average prices partly due to a lack of competition in the region. It is expected that competition in the gas market will improve once the broader regional gas market is established. The Klaipeda LNG terminal provides Estonia with access to an alternative source of gas supply and so has ended its previous isolation in the gas sector. There are plans to develop more projects in the coming years in order to further increase security of supply and integration of the region's markets.

Graph 3.5.4: **Market concentration index for power generation**



Source: EC Commission, based on ENTSOE Winter Outlook 2016/2017

Estonia is not on track to meet the current EU waste targets or create a 'recycling economy' where only residual waste is incinerated. There is clear scope to further improve the separate collection of waste, in particular by extending it to organic waste and waste for recycling. Economic instruments, such as an incineration tax, could make recycling a more economically feasible option.

In transport the challenge is to introduce more sustainable and intelligent solutions. In rail passenger transport, the introduction of new trains and infrastructure upgrades have led to a remarkable increase in rail passenger travel (more than 50 % since 2013). In the medium term, the Rail Baltica project will remain an important investment for the whole region. The updated cost-benefit analysis of the project, delivered in April 2017, confirmed the positive expected impact on economic growth in the region, as well as on the environment due to the modal shift from road to rail.

ANNEX A: OVERVIEW TABLE

Commitments	**Summary assessment (** [1] **)**
2017 Country-specific recommendations (CSRs)	
CSR 1: Pursue its fiscal policy in line with the requirements of the preventive arm of the Stability and Growth Pact, which entails remaining at its medium-term budgetary objective in 2018. Improve the adequacy of the social safety net. Take measures to reduce the gender pay gap, in particular by improving wage transparency and reviewing the parental leave system.	Estonia has made **Some Progress** in addressing CSR 1 This overall assessment of CSR 1 does not include an assessment of compliance with the Stability and Growth Pact.
Pursue its fiscal policy in line with the requirements of the preventive arm of the Stability and Growth Pact, which entails remaining at its medium-term budgetary objective in 2018.	The compliance assessment with the Stability and Growth Pact will be included in Spring when final data for 2017 is available.
Improve the adequacy of the social safety net.	**Some Progress** Some steps are being taken to provide more adequate pension for pensioners living alone, higher and more flexible subsistence allowance and higher family allowances. Despite recent measures, social safety nets still do not provide adequate income support and the increasing share of the population at risk-of-poverty is a concern. The actual impact of the recent reforms therefore requires proper monitoring and assessment. The inadequacy of financing is the highest for pensions, disability benefits and long-term care services.
Take measures to reduce the gender pay gap,	**Some Progress** Some progress was made regarding reducing the gender pay gap. Modifications to the parental leave system and parental benefits were adopted by the Parliament, implementation from 2018 onwards in steps. Amendments to the Gender Equality Act with a view to improving transparency of wages are planned to be adopted by the government in Spring 2018.
in particular by improving wage transparency and	**Limited Progress** Amendments to the Gender Equality Act with a view to improving transparency of wages are planned to be adopted by the government in Spring 2018.
reviewing the parental leave system.	**Some Progress** Modifications to the parental leave system and parental benefits were adopted by the Parliament, implementation from 2018 onwards in steps.

Commitments	Summary assessment ([1])
CSR 2: Promote private investment, research, technology and innovation, including by implementing measures for strengthening the cooperation between academia and businesses.	Estonia has made **Some Progress** in addressing CSR 2
Promote private investment, research, technology and innovation,	**Some Progress** Estonia put in place various measures to increase the potential for private investment but the impact of these measures to date has been limited.
including by implementing measures for strengthening the cooperation between academia and businesses.	**Some Progress** Measures were put in place and their implementation is on the way, but it is not yet possible to assess the effectiveness of the new measures compared to the earlier measures.
Europe 2020 (national targets and progress)	
Employment rate target set in the 2013 NRP: 76 %	The Estonian national target for employment (20-64 age group) is set at 76 %, which means bringing an additional 38 000 people into employment compared to 2009. The target was already reached in 2015 (76.5 %) and maintained in 2016 (76.6 %).
R&D target set in the 2013 NRP: 3 % of GDP, of which 2 % for the private sector.	In 2016, R&D investment in Estonia decreased to 1.28 % of GDP, down from 1.49 % in 2015, and remains below the EU average of 2 % of GDP. Business enterprise expenditure in R&D also decreased slightly from 0.69 in 2015 to 0.66% in 2016. Private R&D intensity continues to be far from the National target (2% of GDP) and the EU average (1.31% of GDP in 2016).
Non-ETS greenhouse gas emissions target: 11% (compared with 2005 emissions)	7.6%. Based on currently available data non-ETS emissions were increased by 7.6% between 2005 and 2016, which is above the interim target. According to the latest national projections submitted to the Commission and taking into account existing measures, the 2020 target is expected to be met by a small margin of 0.3% points. Source: EC and EEA; 2016 data based on approximated inventory data, 2020 data based on projections with existing measures 2017 submission.
Renewable energy target: 25%	28.8% (2016; Eurostat). Efforts might be needed to avoid the decline of indicator.
Energy efficiency: absolute level of primary energy consumption of 6.5 Mtoe	6.13 (2016; Eurostat).

Commitments	Summary assessment ([1])
Early school leaving target: 9.5 % of the 18-24 year-olds with at most lower secondary education and who are currently not in further education or training.	In 2016 the rate (10.9) improved the from 2015 (12.2 %) and further efforts could help achieve the target.
Tertiary education target: 40 % of those aged 30-34 having successfully completed tertiary education	In 2016, the rate was 45.4 %.
Target for the reduction of population at risk of poverty: 15 % in 2020	A reduction in the at-risk-of-poverty rate from 17.5 % in 2010 (income year) to 15 % in 2020 (income year). The number of people at risk of poverty in 2016 remained unaltered. The national poverty reduction target of 15 % continues to be very challenging. At-risk-of-poverty rate (survey year): 2016: 21.7 % 2014:21.8 %, 2015: 21.6 %

([1]) The following categories are used to assess progress in implementing the 2017 country-specific recommendations (CSRs):

No progress: The Member State has not credibly announced nor adopted any measures to address the CSR. This category covers a number of typical situations, to be interpreted on a case-by-case basis taking into account country-specific conditions. They include the following:
no legal, administrative, or budgetary measures have been announced in the national reform programme,

in any other official communication to the national Parliament/relevant parliamentary committees or the European Commission,

publicly (e.g. in a press statement or on the government's website);

no non-legislative acts have been presented by the governing or legislative body;

the Member State has taken initial steps in addressing the CSR, such as commissioning a study or setting up a study group to analyse possible measures to be taken (unless the CSR explicitly asks for orientations or exploratory actions). However, it has not proposed any clearly-specified measure(s) to address the CSR.

Limited progress: The Member State has:

announced certain measures but these address the CSR only to a limited extent; and/or

presented legislative acts in the governing or legislative body but these have not been adopted yet and substantial further, non-legislative work is needed before the CSR is implemented;

presented non-legislative acts, but has not followed these up with the implementation needed to address the CSR.

Some progress: The Member State has adopted measures

that partly address the CSR; and/or

that address the CSR, but a fair amount of work is still needed to address the CSR fully as only a few of the measures have been implemented. For instance, a measure or measures have been adopted by the national Parliament or by ministerial decision, but no implementing decisions are in place.

Substantial progress: The Member State has adopted measures that go a long way towards addressing the CSR and most of them have been implemented.

Full implementation: The Member State has implemented all measures needed to address the CSR appropriately.

ANNEX B: MACROECONOMIC IMBALANCE PROCEDURE SCOREBOARD

Table B.1: **The MIP scoreboard for Estonia (AMR 2018)**

			Thresholds	2011	2012	2013	2014	2015	2016
External imbalances and competitiveness	**Current account balance, % of GDP**	3 year average	**-4%/6%**	1.9	0.4	0.0	-0.4	0.9	1.4
	Net international investment position	% of GDP	**-35%**	-54.8	-51.1	-50.1	-46.9	-39.8	-37.1
	Real effective exchange rate - 42 trading partners, HICP deflator	3 year % change	**±5% (EA) ±11% (Non-EA)**	-0.8	-3.6	3.1	4.8	5.9	4.5
	Export market share - % of world exports	5 year % change	**-6%**	24.5	7.3	10.2	20.4	7.9	-0.7
	Nominal unit labour cost index (2010=100)	3 year % change	**9% (EA) 12% (Non-EA)**	-2.6	0.0	9.1	14.0	13.5	13.4
Internal imbalances	**House price index (2015=100), deflated**	1 year % change	**6%**	2.7	3.2	7.5	13.0	7.1	3.8
	Private sector credit flow, consolidated	% of GDP	**14%**	-1.1	6.8	3.5	5.7	3.0	5.9
	Private sector debt, consolidated	% of GDP	**133%**	120.4	117.8	115.9	118.0	115.2	115.4
	General government gross debt	% of GDP	**60%**	6.1	9.7	10.2	10.7	10.0	9.4
	Unemployment rate	3 year average	**10%**	14.2	13.0	10.3	8.7	7.4	6.8
	Total financial sector liabilities, non-consolidated	1 year % change	**16.5%**	-0.6	10.4	10.4	13.1	8.7	7.2
Employment indicators	**Activity rate - % of total population aged 15-64**	3 year change in pp	**-0.2 pp**	0.5	0.8	1.2	0.5	1.9	2.4
	Long-term unemployment rate - % of active population aged 15-74	3 year change in pp	**0.5 pp**	5.4	1.8	-3.8	-3.8	-3.1	-1.7
	Youth unemployment rate - % of active population aged 15-24	3 year change in pp	**2 pp**	10.4	-6.5	-14.2	-7.4	-7.8	-5.3

1) This table provides data as published under the Alert Mechanism Report 2018, which reports data as of 24 Oct 2017. Please note that figures reported in this table may therefore differ from more recent data elsewhere in this document. 2) Unemployment rate: i = Eurostat back-calculation to include 2011 Population Census results. 3) Youth unemployment rate: i = Eurostat back-calculation to include 2011 Population Census results.
Source: European Commission 2017, Statistical Annex to the Alert Mechanism Report 2018, SWD(2017) 661.

ANNEX C: STANDARD TABLES

Table C.1: **Financial market indicators**

	2012	2013	2014	2015	2016	2017
Total assets of the banking sector (% of GDP)[1)]	109.7	105.4	108.5	114.2	117.1	107.7
Share of assets of the five largest banks (% of total assets)	89.6	89.7	89.9	88.6	88.0	-
Foreign ownership of banking system (% of total assets)[2)]	96.4	95.7	95.1	94.2	93.4	92.2
Financial soundness indicators:[2)]						
- non-performing loans (% of total loans)[3)]	3.0	1.9	2.6	1.9	1.5	1.9
- capital adequacy ratio (%)	23.2	23.1	41.8	35.4	34.4	35.9
- return on equity (%)[4)]	11.7	10.7	9.7	6.8	11.1	5.6
Bank loans to the private sector (year-on-year % change)[1)]	-0.4	2.7	4.5	9.3	9.5	1.6
Lending for house purchase (year-on-year % change)[1)]	0.2	1.2	2.9	4.5	5.5	6.8
Loan to deposit ratio[1)]	134.4	128.9	124.0	122.1	122.5	120.3
Central Bank liquidity as % of liabilities[1)]	-	-	0.3	0.4	0.4	0.4
Private debt (% of GDP)	117.8	115.9	118.0	115.2	115.4	-
Gross external debt (% of GDP)[2)] - public	7.0	7.6	8.0	7.2	7.1	6.5
- private	49.4	47.4	49.3	46.0	43.7	41.6
Long-term interest rate spread versus Bund (basis points)*	-	-	-	-	-	-
Credit default swap spreads for sovereign securities (5-year)*	101.3	58.6	57.1	58.3	58.5	55.6

1) Latest data Q3 2017. Includes not only banks but all monetary financial institutions excluding central banks
2) Latest data Q2 2017.
3) As per ECB definition of gross non-performing debt instruments
4) Quarterly values are not annualised
* Measured in basis points.
Source: European Commission (long-term interest rates); World Bank (gross external debt); Eurostat (private debt); ECB (all other indicators).

Table C.2: **Headline Social Scoreboard indicators**

	2012	2013	2014	2015	2016	2017 [5]
Equal opportunities and access to the labour market						
Early leavers from education and training (% of population aged 18-24)	10.3	9.7	12.0	12.2	10.9	:
Gender employment gap (pps)	5.7	6.6	7.7	7.9	8.2	7.6
Income inequality, measured as quintile share ratio (S80/S20)	5.4	5.5	6.5	6.2	5.6	:
At-risk-of-poverty or social exclusion rate[1] (AROPE)	23.4	23.5	26.0	24.2	24.4	:
Young people neither in employment nor in education and training (% of population aged 15-24)	12.2	11.3	11.7	10.8	9.1	:
Dynamic labour markets and fair working conditions†						
Employment rate (20-64 years)	72.2	73.3	74.3	76.5	76.6	78.3
Unemployment rate[2] (15-74 years)	10.0	8.6	7.4	6.2	6.8	6.0
Gross disposable income of households in real terms per capita[3] (Index 2008=100)	:	:	99.9	104.6	:	:
Public support / Social protection and inclusion						
Impact of social transfers (excluding pensions) on poverty reduction[4]	29.4	26.8	23.2	22.3	24.9	:
Children aged less than 3 years in formal childcare	18.0	21.0	19.4	21.4	30.2	:
Self-reported unmet need for medical care	8.3	8.4	11.3	12.7	15.3	:
Individuals who have basic or above basic overall digital skills (% of population aged 16-74)	:	:	:	65.0	60.0	60.0

The Social Scoreboard includes 14 headline indicators, of which 12 are currently used to compare Member States performance. The indicators "participants in active labour market policies per 100 persons wanting to work" and "compensation of employees per hour worked (in EUR)" are not used due to technical concerns by Member States. Possible alternatives will be discussed in the relevant Committees.
(1) People at risk of poverty or social exclusion (AROPE): individuals who are at risk of poverty (AROP) and/or suffering from severe material deprivation (SMD) and/or living in households with zero or very low work intensity (LWI).
(2) Unemployed persons are all those who were not employed but had actively sought work and were ready to begin working immediately or within two weeks.
(3) Gross disposable household income is defined in unadjusted terms, according to the draft Joint Employment Report 2018.
(4) Reduction in percentage of the risk of poverty rate, due to social transfers (calculated comparing at-risk-of poverty rates before social transfers with those after transfers; pensions are not considered as social transfers in the calculation).
(5) Average of first three quarters of 2017, except for the indicator "individual who have basic or above basic digital skills" (annual data). Data for unemployment rate is seasonally adjusted.
Source: Eurostat

Table C.3: **Labour market and education indicators**

Labour market indicators	**2012**	**2013**	**2014**	**2015**	**2016**	**2017** [5]
Activity rate (15-64)	74.8	75.1	75.2	76.7	77.5	:
Employment in current job by duration						
From 0 to 11 months	16.1	15.3	15.2	14.8	15.6	:
From 12 to 23 months	12.3	11.9	11.2	11.9	11.4	:
From 24 to 59 months	17.1	19.0	20.3	20.9	21.2	:
60 months or over	54.6	53.8	53.1	52.2	51.6	:
Employment growth* (% change from previous year)	1.6	1.2	0.8	2.9	0.3	1.6
Employment rate of women (% of female population aged 20-64)	69.4	70.1	70.6	72.6	72.6	74.5
Employment rate of men (% of male population aged 20-64)	75.1	76.7	78.3	80.5	80.8	82.1
Employment rate of older workers* (% of population aged 55-64)	60.5	62.6	64.0	64.5	65.2	67.6
Part-time employment* (% of total employment, aged 15-64)	9.2	8.9	8.3	9.5	9.9	9.5
Fixed-term employment* (% of employees with a fixed term contract, aged 15-64)	3.5	3.5	3.1	3.4	3.7	3.1
Transition rate from temporary to permanent employment (3-year average)	47.0	63.0	62.5	55.7	:	:
Long-term unemployment rate[1] (% of labour force)	5.5	3.8	3.3	2.4	2.1	2.0
Youth unemployment rate (% active population aged 15-24)	20.9	18.7	15.0	13.1	13.4	13.7
Gender gap in part-time employment	8.2	6.9	5.5	7.4	6.5	7.5
Gender pay gap[2] (in undadjusted form)	29.9	29.8	28.1	26.9	:	:
Education and training indicators	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Adult participation in learning (% of people aged 25-64 participating in education and training)	12.8	12.6	11.6	12.4	15.7	:
Underachievement in education[3]	10.5	:	:	11.2	:	:
Tertiary educational attainment (% of population aged 30-34 having successfully completed tertiary education)	39.5	42.5	43.2	45.3	45.4	:
Variation in performance explained by students' socio-economic status[4]	8.6	:	:	7.8	:	:

* Non-scoreboard indicator
(1) Long-term unemployed are people who have been unemployed for at least 12 months.
(2) Difference between the average gross hourly earnings of male paid employees and of female paid employees as a percentage of average gross hourly earnings of male paid employees. It is defined as "unadjusted", as it does not correct for the distribution of individual characteristics (and thus gives an overall picture of gender inequalities in terms of pay). All employees working in firms with ten or more employees, without restrictions for age and hours worked, are included.
(3) PISA (OECD) results for low achievement in mathematics for 15 year-olds.
(4) Impact of socio-economic and cultural status on PISA (OECD) scores. Values for 2012 and 2015 refer respectively to mathematics and science.
(5) Average of first three quarters of 2017. Data for youth unemployment rate is seasonally adjusted.
Source: Eurostat, OECD

Table C.4: **Social inclusion and health indicators**

	2012	2013	2014	2015	2016	2017
Expenditure on social protection benefits* (% of GDP)						
Sickness/healthcare	4.2	4.1	4.4	4.6	:	:
Disability	1.7	1.8	1.8	1.8	:	:
Old age and survivors	6.6	6.6	6.6	7.1	:	:
Family/children	1.7	1.6	1.6	2.1	:	:
Unemployment	0.5	0.5	0.4	0.4	:	:
Housing	0.0	0.0	0.0	0.0	:	:
Social exclusion n.e.c.	0.1	0.1	0.1	0.1	:	:
Total	14.8	14.7	14.9	16.2	:	:
of which: means-tested benefits	0.1	0.1	0.1	0.1	:	:
General government expenditure by function (% of GDP, COFOG)						
Social protection	12.3	11.9	11.9	12.9	13.5	:
Health	5.0	5.0	5.2	5.5	5.3	:
Education	6.3	6.0	5.7	6.1	5.9	:
Out-of-pocket expenditure on healthcare (% of total health expenditure)	21.5	22.6	22.6	22.8	:	:
Children at risk of poverty or social exclusion (% of people aged 0-17)*	22.4	22.3	23.8	22.5	21.2	:
At-risk-of-poverty rate[1] (% of total population)	17.5	18.6	21.8	21.6	21.7	:
In-work at-risk-of-poverty rate (% of persons employed)	8.3	7.6	11.8	10.0	9.6	:
Severe material deprivation rate[2] (% of total population)	9.4	7.6	6.2	4.5	4.7	:
Severe housing deprivation rate[3], by tenure status						
Owner, with mortgage or loan	2.3	4.4	2.2	1.9	0.9	:
Tenant, rent at market price	3.7	5.1	8.1	4.3	6.1	:
Proportion of people living in low work intensity households[4] (% of people aged 0-59)	9.1	8.4	7.6	6.6	5.8	:
Poverty thresholds, expressed in national currency at constant prices*	2812	2965	3151	3428	3754	:
Healthy life years (at the age of 65)						
Females	5.5	5.7	6.0	5.3	:	:
Males	5.4	5.1	4.9	5.3	:	:
Aggregate replacement ratio for pensions[5] (at the age of 65)	0.5	0.5	0.5	0.4	0.5	:
Connectivity dimension of the Digital Economy and Society Inedex (DESI)[6]	:	:	44.8	51.8	56.7	62.2
GINI coefficient before taxes and transfers*	48.6	48.9	51.6	49.9	47.5	:
GINI coefficient after taxes and transfers*	32.5	32.9	35.6	34.8	32.7	:

* Non-scoreboard indicator
(1) At-risk-of-poverty rate (AROP): proportion of people with an equivalised disposable income below 60 % of the national equivalised median income.
(2) Proportion of people who experience at least four of the following forms of deprivation: not being able to afford to i) pay their rent or utility bills, ii) keep their home adequately warm, iii) face unexpected expenses, iv) eat meat, fish or a protein equivalent every second day, v) enjoy a week of holiday away from home once a year, vi) have a car, vii) have a washing machine, viii) have a colour TV, or ix) have a telephone.
(3) Percentage of total population living in overcrowded dwellings and exhibiting housing deprivation.
(4) People living in households with very low work intensity: proportion of people aged 0-59 living in households where the adults (excluding dependent children) worked less than 20 % of their total work-time potential in the previous 12 months.
(5) Ratio of the median individual gross pensions of people aged 65-74 relative to the median individual gross earnings of people aged 50-59.
(6) Fixed broadband take up (33%), mobile broadband take up (22%), speed (33%) and affordability (11%), from the Digital Scoreboard.***Source:*** Eurostat, OECD

Table C.5: **Product market performance and policy indicators**

Performance Indicators	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Labour productivity (real, per person employed, year-on-year % change)							
Labour productivity in Industry	12.60	-1.81	5.99	6.32	9.28	-1.46	-2.01
Labour productivity in Construction	23.68	-5.68	7.83	-1.92	-8.28	-13.46	16.61
Labour productivity in Market Services	4.68	-0.99	5.66	0.01	-0.47	-1.10	1.23
Unit labour costs (ULC) (whole economy, year-on-year % change)							
ULC in Industry	-12.63	-0.66	9.18	1.51	-0.50	3.14	2.93
ULC in Construction	-6.98	-11.14	4.98	5.88	2.16	1.54	5.94
ULC in Market Services	-5.04	0.09	4.81	3.19	7.69	6.10	2.40
Business Environment	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
Time needed to enforce contracts[(1)] (days)	425.0	425.0	425.0	425.0	425.0	425.0	425.0
Time needed to start a business[(1)] (days)	6.5	6.5	6.5	6.5	4.5	3.5	3.5
Outcome of applications by SMEs for bank loans[(2)]	na	0.89	na	0.91	0.66	0.19	0.82
Research and innovation	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**
R&D intensity	1.58	2.31	2.12	1.72	1.45	1.49	1.28
General government expenditure on education as % of GDP	6.60	6.20	6.30	6.00	5.70	6.10	na
Persons with tertiary education and/or employed in science and technology as % of total employment	50	50	51	51	51	51	51
Population having completed tertiary education[(3)]	30	31	32	32	33	33	34
Young people with upper secondary level education[(4)]	84	83	81	84	83	82	84
Trade balance of high technology products as % of GDP	-1.58	-0.67	-0.88	-0.32	-0.33	-0.34	na
Product and service markets and competition					**2003**	**2008**	**2013**
OECD product market regulation (PMR)[(5)], overall					na	1.37	1.29
OECD PMR5, retail					na	1.40	1.50
OECD PMR5, professional services					na	1.81	1.79
OECD PMR5, network industries[(6)]					3.34	2.60	2.40

(1) The methodologies, including the assumptions, for this indicator are shown in detail here: http://www.doingbusiness.org/methodology.
(2) Average of the answer to question Q7B_a. "[Bank loan]: If you applied and tried to negotiate for this type of financing over the past six months, what was the outcome?". Answers were codified as follows: zero if received everything, one if received most of it, two if only received a limited part of it, three if refused or rejected and treated as missing values if the application is still pending or don't know.
(3) Percentage population aged 15-64 having completed tertiary education.
(4) Percentage population aged 20-24 having attained at least upper secondary education.
(5) Index: 0 = not regulated; 6 = most regulated. The methodologies of the OECD product market regulation indicators are shown in detail here: http://www.oecd.org/competition/reform/indicatorsofproductmarketregulationhomepage.htm
(6) Aggregate OECD indicators of regulation in energy, transport and communications (ETCR).
Source: "European Commission; World Bank — Doing Business (for enforcing contracts and time to start a business); OECD (for the product market regulation
indicators); SAFE (for outcome of SMEs' applications for bank loans)."

Table C.6: **Green growth**

Green growth performance		2011	2012	2013	2014	2015	2016
Macroeconomic							
Energy intensity	kgoe / €	0.39	0.37	0.40	0.37	0.36	0.35
Carbon intensity	kg / €	1.34	1.22	1.30	1.22	1.02	-
Resource intensity (reciprocal of resource productivity)	kg / €	2.24	2.16	2.25	2.14	2.06	1.85
Waste intensity	kg / €	-	1.33	-	1.26	-	-
Energy balance of trade	% GDP	-0.4	-1.3	-2.2	-2.1	-1.5	-1.0
Weighting of energy in HICP	%	13.93	14.69	14.42	14.43	13.65	10.58
Difference between energy price change and inflation	%	1.3	7.2	7.4	-4.6	-4.1	-5.1
Real unit of energy cost	% of value added	14.9	15.6	15.7	14.6	-	-
Ratio of environmental taxes to labour taxes	ratio	0.17	0.17	0.16	0.16	0.16	-
Environmental taxes	% GDP	2.7	2.7	2.6	2.7	2.8	3.1
Sectoral							
Industry energy intensity	kgoe / €	0.19	0.18	0.19	0.16	0.14	0.13
Real unit energy cost for manufacturing industry excl. refining	% of value added	13.5	13.5	14.2	13.3	-	-
Share of energy-intensive industries in the economy	% GDP	12.85	12.33	12.76	13.90	14.02	13.23
Electricity prices for medium-sized industrial users	€ / kWh	0.07	0.08	0.10	0.09	0.09	0.09
Gas prices for medium-sized industrial users	€ / kWh	0.03	0.04	0.04	0.04	0.03	0.02
Public R&D for energy	% GDP	0.02	0.02	0.01	0.01	0.02	0.00
Public R&D for environmental protection	% GDP	0.05	0.03	0.04	0.04	0.05	0.02
Municipal waste recycling rate	%	23.3	19.1	17.9	31.3	28.3	28.1
Share of GHG emissions covered by ETS*	%	72.3	69.7	73.5	71.1	67.7	69.7
Transport energy intensity	kgoe / €	0.64	0.63	0.61	0.64	0.68	0.68
Transport carbon intensity	kg / €	1.87	1.84	1.78	1.86	2.00	-
Security of energy supply							
Energy import dependency	%	12.0	17.0	11.9	9.2	7.3	6.8
Aggregated supplier concentration index	HHI	74.7	79.6	73.0	76.6	11.5	-
Diversification of energy mix	HHI	0.49	0.45	0.48	0.48	0.44	0.43

All macro intensity indicators are expressed as a ratio of a physical quantity to GDP (in 2010 prices)
Energy intensity: gross inland energy consumption (in kgoe) divided by GDP (in EUR)
Carbon intensity: greenhouse gas emissions (in kg CO2 equivalents) divided by GDP (in EUR)
Resource intensity: domestic material consumption (in kg) divided by GDP (in EUR)
Waste intensity: waste (in kg) divided by GDP (in EUR)
Energy balance of trade: the balance of energy exports and imports, expressed as % of GDP
Weighting of energy in HICP: the proportion of 'energy' items in the consumption basket used for the construction of the HICP
Difference between energy price change and inflation: energy component of HICP, and total HICP inflation (annual % change)
Real unit energy cost: real energy costs as % of total value added for the economy
Industry energy intensity: final energy consumption of industry (in kgoe) divided by gross value added of industry (in 2010 EUR)
Real unit energy costs for manufacturing industry excluding refining : real costs as % of value added for manufacturing sectors
Share of energy-intensive industries in the economy: share of gross value added of the energy-intensive industries in GDP
Electricity and gas prices for medium-sized industrial users: consumption band 500–20 00MWh and 10 000–100 000 GJ; figures excl. VAT.
Recycling rate of municipal waste: ratio of recycled and composted municipal waste to total municipal waste
Public R&D for energy or for the environment: government spending on R&D for these categories as % of GDP
Proportion of GHG emissions covered by EU emissions trading system (ETS) (excluding aviation): based on GHG emissions (excl. land use, land use change and forestry) as reported by Member States to the European Environment Agency.
Transport energy intensity: final energy consumption of transport activity (kgoe) divided by transport industry gross value added (in 2010 EUR)
Transport carbon intensity: GHG emissions in transport activity divided by gross value added of the transport sector
Energy import dependency: net energy imports divided by gross inland energy consumption incl. consumption of international bunker fuels
Aggregated supplier concentration index: covers oil, gas and coal. Smaller values indicate larger diversification and hence lower risk.
Diversification of the energy mix: Herfindahl index covering natural gas, total petrol products, nuclear heat, renewable energies and solid fuels
* European Commission and European Environment Agency
Source: European Commission and European Environment Agency (Share of GHG emissions covered by ETS); European Commission (Environmental taxes over labour taxes and GDP); Eurostat (all other indicators)

REFERENCES

Berg, A. and Ostry, J. D. (2011), *Inequality and Unsustainable Growth: Two Sides of the Same Coin? IMF Staff Discussion Note 2011SDN/11/08*, International Monetary Fund, Washington.

Center for Social and Economic Research (CASE) (2017), *Study and reports on the VAT gap in the EU-28 Member States: 2017 final report* (https://ec.europa.eu/taxation_customs/sites/taxation/files/study_and_reports_on_the_vat_gap_2017.pdf).

European Commission (2018a), *EU Single Market Scoreboard 2017* (http://ec.europa.eu/internal_market/scoreboard and https://opentender.eu/).

European Commission (2018b), *Digital Scoreboard* (https://ec.europa.eu/digital-single-market/en/scoreboard/).

European Commission (2017a), *Autumn 2017 Economic Forecast* (https://ec.europa.eu/info/business-economy-euro/economic-performance-and-forecasts/economic-forecasts/autumn-2017-economic-forecast_en#autumn-2017-economic-forecast-continued-growth-in-a-changing-policy-context).

European Commission (2017b), AMECO database (https://ec.europa.eu/info/business-economy-euro/indicators-statistics/economic-databases/macro-economic-database-ameco/ameco-database_en#forecasts).

European Commission (2017c), *Flash Eurobarometer 417: European businesses and public administration*, Publications Office of the European Union, Luxembourg (https://data.europa.eu/euodp/data/dataset/S2089_417_ENG).

European Environment Agency (EEA) (2016), *Air quality in Europe — 2016 report* No 28/2016, Publications Office of the European Union, Luxembourg (https://www.eea.europa.eu/publications/air-quality-in-europe-2016/folder_contents).

OECD (2017), *OECD Economic Surveys: Estonia 2017* (http://dx.doi.org/10.1787/eco_surveys-est-2017-en).

OECD (2015), *"In it Together: Why Less Inequality Benefits All"*, Chapter 2: The impact of income inequality on economic growth, 2015.

PricewaterhouseCoopers, World Bank group (2018), *Paying Taxes 2018* (https://www.pwc.com/gx/en/paying-taxes/pdf/pwc_paying_taxes_2018_full_report.pdf?WT.mc_id=CT13-PL1300-DM2-TR2-LS1-ND30-TTA4-CN_payingtaxes-2018-intro-pdf-button).

OECD/European Observatory on Health Systems and Policies (2017), *Estonia: Country Health Profile 2017*, State of Health in the EU, OECD Publishing, Paris/European Observatory on Health Systems and Policies, Brussels. http://dx.doi.org/10.1787/9789264283350-en.

World Bank Group (2015), *The State of Health Care Integration in Estonia*, https://www.haigekassa.ee/sites/default/files/Maailmapanga-uuring/summary_report_hk_2015.pdf .

European Social Policy Network (ESPN 2018), Flash Report, *Changes to Estonian subsistence benefit system make it more flexible and motivate working*, February 2018.

World Bank (2016), *Doing Business 2016: Measuring Regulatory Quality and Efficiency*, Washington DC (http://www.doingbusiness.org/~/media/WBG/DoingBusiness/Documents/Annual-Reports/English/DB16-Full-Report.pdf).

Ramboll Management Consulting and Corit Advisory (2016), '*Study on Structures of Aggressive Tax Planning and Indicators'*, European Commission Taxation Paper Nr. 61. Publications Office of the European Union, Luxembourg.

van't Riet and Lejour (2017), "*Optimal Tax Routing: Network Analysis of FDI diversion*", *CPB Discussion Paper* 349 (https://www.cpb.nl/en/publication/optimal-tax-routing-network-analysis-fdi-diversion)