



Council of the
European Union

Brussels, 1 March 2016
(OR. en)

6603/16

ECOFIN 173
UEM 74
SOC 119
EMPL 78
COMPET 93
ENV 119
EDUC 62
RECH 51
ENER 63
JAI 159

COVER NOTE

From: Secretary-General of the European Commission,
signed by Mr Jordi AYET PUIGARNAU, Director

date of receipt: 26 February 2016

To: Mr Jeppe TRANHOLM-MIKKELSEN, Secretary-General of the Council of
the European Union

No. Cion doc.: SWD(2016) 76 final

Subject: COMMISSION STAFF WORKING DOCUMENT Country Report Estonia
2016 Including an In-Depth Review on the prevention and correction of
macroeconomic imbalances

Delegations will find attached document SWD(2016) 76 final.

Encl.: SWD(2016) 76 final



Brussels, 26.2.2016
SWD(2016) 76 final

COMMISSION STAFF WORKING DOCUMENT

Country Report Estonia 2016

**Including an In-Depth Review on the prevention
and correction of macroeconomic imbalances**

This document is a European Commission staff working document. It does not constitute the official position of the Commission, nor does it prejudge any such position.

EN

EN

CONTENTS

Executive summary	1
1. Scene setter: Economic situation and outlook	4
2. Imbalances, risks, and adjustment issues	13
2.1. Competitiveness developments	13
2.2. Housing prices	25
2.3. MIP assessment matrix	36
3. Additional structural issues	38
3.1. Fiscal framework and taxation framework	38
3.2. Labour market, social policies and education	40
3.3. Technological development	49
3.4. Infrastructure and energy efficiency	53
3.5. Local government reform	56
A. Overview table	60
B. MIP scoreboard	65
C. Standard tables	66

LIST OF TABLES

1.1. Key economic, financial and social indicators - Estonia	12
2.2.1. Composite index of tax incentives for owner-occupied housing	26
2.2.2. Financial soundness indicators	34
2.3.1. MIP assessment matrix(*) - Estonia	36
3.3.1. Venture capital investments as a percentage of GDP (2014 or latest available year)	52
B.1. The MIP scoreboard for Estonia	65
C.1. Financial market indicators	66
C.2. Labour market and social indicators	67
C.3. Labour market and social indicators (continued) (*)	68
C.4. Structural policy and business environment indicators	69
C.5. Green growth	71

LIST OF GRAPHS

1.1. Real GDP growth and contributions	4
--	---

1.2.	Quarterly HICP inflation (yoy % change)	5
1.3.	Labour market indicators	5
1.4.	Poverty and social indicators (1)	6
1.5.	Decomposition of external position (current and capital accounts)	6
1.6.	Export market share growth rate by value of goods and services	7
1.7.	Net international investment position (NIIP, %, of GDP)	7
1.8.	Net lending/net borrowing by sector (% of GDP)	8
2.1.1.	Breakdown of changes in unit labour costs (ULC)	13
2.1.2.	Exports of goods and services (in value) in % of GDP: openness of Estonia, Latvia, Lithuania, Finland and Sweden	14
2.1.3.	Convergence in income per capita in purchasing power standards (PPS): Estonia, Latvia, Lithuania, Spain, Sweden	14
2.1.4.	Growth in exports of goods by value, contribution to export market share for goods, real effective exchange rate (REER)	15
2.1.5.	Actual nominal wage growth and expected wage growth at constant ULC-based REER	15
2.1.6.	Growth in nominal unit labour cost by sector from 2011 to 2014	16
2.1.7.	Working age population (25-64) by educational attainment level and projections for 2016-2030 (in thousands)	16
2.1.8.	Estonian residents employed abroad, emigrants and immigrants, 2004-2014	17
2.1.9.	Relationship between unemployment and the job vacancy rate (Beveridge curve)	17
2.1.10.	Vacancy rate and wage growth in the ICT sector and in the whole economy	18
2.1.11.	Relationship between employment creation and GDP growth (Okun Law)	18
2.1.12.	Saving and investment by sector - Estonia	19
2.1.13.	Gross fixed capital formation by asset type	19
2.1.14.	Rate of change of nominal ULC broken down by growth accounting contributor	20
2.1.15.	Change in average quality rank over time for Estonia, Latvia and Lithuania for manufactured goods (1)	20
2.1.16.	Quality density function per quality rank	21
2.1.17.	High tech trade's share of total exports of goods and services (in %)	21
2.1.18.	Change in export market shares for goods intra-/extra-EU by value of goods	22
2.1.19.	Estonia's export growth by value of goods to the Russian Federation and to the rest of the world	22
2.1.20.	Export competitiveness of Estonian goods vis-à-vis top-10 destinations (2013-2014) (1)	23
2.1.21.	Exported value added by destination (2011)	23
2.2.1.	Deflated house prices	25
2.2.2.	Home ownership with or without a mortgage (% of households)	25
2.2.3.	Share of households renting at 'market price'	26
2.2.4.	Population trends in Estonia and Tallinn	27
2.2.5.	Housing: m ² per household in EU	27
2.2.6.	Housing size trends in Estonia	28
2.2.7.	Average apartment square metre price trends in Tallinn and in the rest of Estonia and number of transactions	28

2.2.8.	Main trends in lending	29
2.2.9.	Households' leverage	29
2.2.10.	Price-to-rent and price-to-income trends	30
2.2.11.	Valuation gaps and house price growth	30
2.2.12.	Valuation gap for main supply and demand fundamentals	30
2.2.13.	Building permits and completions	31
2.2.14.	Residential construction as % of GDP	31
2.2.15.	Construction output volume (lhs) and share of construction sector employment (rhs)	31
2.2.16.	Aggregate wage growth and construction sector wage growth	32
2.2.17.	Construction price index components	32
2.2.18.	Lending to private sector as % of GDP	33
2.2.19.	Main trends in the balance sheet of the banking sector funding (ratio of loans to deposits)	33
3.1.1.	Selected taxes by function, in % of GDP	38
3.2.1.	Activity (1), employment (1) and unemployment rates (2)	40
3.2.2.	Tax wedge of single earners in Estonia and the EU - Various income levels - 2014	41
3.2.3.	Minimum wage in % of the national average wage	42
3.2.4.	Employment rate of women aged 25-49	42
3.2.5.	Enrolment of children up to three years old in formal childcare (2014)	43
3.2.6.	Persons receiving disability pension/pension for incapacity for work	44
3.2.7.	Performance of young people (15-24) on the labour market	45
3.2.8.	Self-reported unmet needs for medical examination by detailed reason (% of respondents, 2013)	46
3.2.9.	EU 2020 headline indicators for early school leavers (ESL) and tertiary attainment (TA) by gender	47
3.3.1.	Gross domestic expenditure on R&D (GERD)	49
3.3.2.	Patent applications to the European Patent Office (by priority year and per million people in the labour force)	50
3.3.3.	Private equity investments as a percentage of GDP - 2014	51
3.4.1.	Energy intensity of the economy: gross inland consumption of energy divided by GDP (kg of oil equivalent per EUR 1000)	53
3.4.2.	Resource productivity in Estonia, compared with the average EU resource productivity	53
3.4.3.	Municipal waste by treatment type (2004-2013)	55
3.5.1.	Number of municipalities and cities by population size (2011)	56
3.5.2.	Entrepreneurship indicators (58
3.5.3.	Total early-stage entrepreneurial activity (1) and established business ownership (2)	58

LIST OF BOXES

1.1.	Investment	9
1.2.	Contribution of the EU Budget to structural change	11

EXECUTIVE SUMMARY

This country report assesses Estonia's economy in the light of the European Commission's Annual Growth Survey published on 26 November 2015. The survey recommends three priorities for the EU economic and social policy in 2016: re-launching investment, pursuing structural reforms to modernise Member States' economies, and responsible fiscal policies. At the same time, the Commission published the Alert Mechanism Report that launched the fifth annual round of the macroeconomic imbalance procedure. The Alert Mechanism Report identified Estonia as warranting an in-depth review.

In 2015, growth slowed down as Estonia's economy suffered from weak external demand and investment, while strong wage growth supported private consumption. From a rate of 1% in 2015, growth is projected to accelerate to more than 2% in the coming years, as external demand and investment are expected to recover gradually. At the same time, household consumption is projected to slow down due to a less dynamic wage growth, mainly linked to wage moderation in the public sector. The fiscal position remains strong, with a budget surplus and a negligible government debt.

Positive developments in the Estonian labour market have to be seen against the backdrop of a shrinking working age population. The Estonian labour market is characterised by its flexibility, participation and employment rates above EU average, and low unemployment. At the same time, low birth rates are forecast to shrink the working age population over the next ten years. This is expected to reduce the unemployment rate.

Estonia is generally performing well on education and training, but closing the gender gap and strengthening human capital will remain challenges in the quest for higher productivity and a high-value added economy. Estonia has high rates of tertiary education attainment and performs well in international skills surveys. Also, participation in lifelong learning is above the EU average. However, some challenges remain, such as early school leaving, gender gaps in educational participation and performance. Labour and skills shortages are considered a barrier to higher investment in high technology sectors.

The Estonian economy is well integrated with its Nordic neighbours and the euro area. The close relationship is characterised by a large share of intra-industry trade flows to and from its immediate neighbours and through relatively large foreign direct investments and credit inflows.

Despite a solid performance of services, Estonia's industry remains dominated by traditional sectors, contributing less to economic growth. Until recently, Estonia has gained in market share as it moved upwards in the global value chain. However, in manufacturing, Estonia's exports structure seems to have shifted towards lower-value goods. The capital stock per worker remains relatively low. Moreover, capital investment remains mostly directed towards low value added sectors such as housing and other buildings. Finally, Estonia's innovation performance has further deteriorated below the European Union average. Overall, this highlights the particular importance for Estonia of strategic investment in research and development, especially at a time when the country's shale oil sector faces serious sustainability risks.

The competition in Estonia's energy market has improved but energy efficiency remains lower than in most other EU Member States. The energy intensity rate in Estonia remains broadly stable against a downward trend in most of the other Member States. Significant investments have been made in public buildings, and investment support has been introduced to improve the energy efficiency of apartment houses. However, there are still many areas in which investment opportunities exist to improve the energy efficiency of local public buildings and residential and industrial buildings. At the same time, given the relatively high share of transport services in GDP, high-quality infrastructure and effective transport systems are vital for Estonia's competitiveness and economic growth.

Overall, Estonia has made some progress in addressing the 2015 country-specific recommendations. On fiscal policy, action was taken to improve tax collection. On labour market, social and education policy issues, some progress was made in alleviating the tax burden on low-income earners, in improving the availability of childcare and, via the Work Ability reform, in reducing the number of health-related exits from

the labour market. Similarly, some progress was made in ensuring the provision of high-quality social services at local level and increasing the labour market relevance of vocational education and training, in particular by improving the availability of apprenticeships. Limited progress was made on action to reduce the gender pay gap. In research, development and innovation, some progress was made in focusing public support on coordinated implementation of a limited number of smart specialisation areas.

Regarding the progress in reaching the national targets under the Europe 2020 Strategy, Estonia is performing well in employment rate, tertiary education attainment, reducing greenhouse gas emissions and renewable energy while more effort is needed in reducing early school leaving, increasing R&D investment, improving energy efficiency and reducing the at risk of poverty.

The main findings of the in-depth review in this country report, and the related policy challenges, are as follows:

- **Unit labour costs have increased rapidly in recent years, driven by strong wage growth and slowing productivity growth.** Estonia benefits from a very flexible labour market, with a decentralised wage setting system and no major matching problems currently. So far, the dynamic wage developments seem to have had a limited impact on net trade. Despite a fall in exports, the nominal trade surplus increased in 2015, with services playing a balancing role. There were specific circumstances that could explain this: the worsening economic difficulties of some of Estonia's main trading partners and falling international oil prices, which made the country's shale oil sector less competitive. Nevertheless, below-average productivity growth and the very slow adaptation to competing in high value added sectors for goods represent a risk if wage growth were to continue at its current pace. Close monitoring of future developments will be necessary.
- **While house price increases have been strong they are still in line with income developments.** This reflects the strong link between the housing demand and wage growth

in recent years. The rapid rise in house prices is not driven by excessive lending, and the construction sector does not appear to have overheated. Compared to the boom years before 2008, lending policies have become more cautious and banks have introduced more restrictive macro-prudential measures. Also, macro-prudential regulations set by the Bank of Estonia have been tightened. House price growth is expected to moderate as supply adjusts to recovering demand. Spillover risks to economic and financial sector stability from the real-estate sector appear low.

Other key economic issues which point to particular challenges facing Estonia's economy are the following:

- **Overall, the tax system is growth-friendly, but categories of taxation that are considered least detrimental to growth are used only to a limited extent.** Tax collection is overall efficient and recent measures to increase tax compliance have been successful. At the same time, the positive impact of recent measures to alleviate the tax burden for low-income earners is expected to fade out relatively soon in a context of still relatively rapid wage increases.
- **Addressing the shrinking working age population will remain a challenge, as it may result in a tight labour market over the years.** This challenge raises the importance of integrating certain groups of the population in the labour market: low-income earners, people with disabilities and mothers with young children. The tax wedge of low-income earners remains relatively high compared with other EU countries despite the measures taken by the government. Also, 10% of the total working age population are currently classified as partially or fully incapable for work. In parallel, insufficient social services at local government level have a direct negative impact on activation measures. Furthermore, the negative impact of parenthood on women's employment in Estonia is high. Reforms in these areas are currently being initiated to address the challenges: incentives to work are being introduced, together with a new Work Ability system so as to increase activity rates.

In parallel, accessibility to childcare services is being improved. The gender pay gap remains a matter for concern as well as drop outs in vocational education and training and the gender gap in education.

- **As the Work Ability reform progresses, matching problems and higher unemployment will need to be addressed.** The Work Ability reform will increase the overall labour supply next year. This will entail significant matching problems and higher unemployment and raise the importance of effective employment measures, together with quality and independence of assessments. For the successful implementation of the Work Ability reform, the role of local governments will be crucial in applying minimum quality standards for social services regulated by the Social Welfare Act and in ensuring the re-entry of incapacity-for-work pensioners into the labour market.
- **Reversing the gradual increase of the population living in poverty or in social exclusion and access to health care are important challenges.** While the long-term unemployment rate, the youth unemployment rate and the severe material deprivation rate have markedly improved, the at-risk-of-poverty rate has increased and is now several points above the EU average due to an increase in the relative poverty threshold, as median equalised disposable household income is increasing rapidly. Also, life expectancy and healthy life expectancy remain low, while Estonia has a problem with health care accessibility.
- **The implementation of the planned local government reform is important.** Many local municipalities are small and population density is uneven across the country, which means that access to local services is not guaranteed in all municipalities and therefore the provision of quality services at local level remains a challenge.
- **Higher investment in technological development is needed to strengthen productivity growth, foster higher value added exports of goods and raise potential output.** Only a limited number of companies collaborate with research institutions, resulting in a low level of patent applications. Also, early stage financing for high-tech projects could be further expanded. Labour and skills shortages may constitute a barrier to higher investment in high technology sectors. Finally, despite recent legislative changes, the lengthy insolvency procedures remain an institutional barrier to investment.
- **Estonia still has substantial work to do on reducing resource intensity.** In particular, limited progress has been registered on the draft regulation for providing district heating systems networks, households and owners of buildings with incentives to reduce losses and invest in energy efficiency. Also, the effectiveness of Estonia's transport infrastructure and passenger rail system has been improved, but transport taxes are almost inexistent, which does not support energy efficiency in road transport. Finally, sufficient future funding does not seem to be ensured for infrastructure maintenance and upgrades and to continue improving logistical services to ensure intermodal connections.

1. SCENE SETTER: ECONOMIC SITUATION AND OUTLOOK

Economic growth

Estonia's economic growth slowed down to about 1.0% in 2015, after 2.9% in 2014, as external demand and investment weakened. Estonia's main export markets were weaker in 2015 especially as a result of the economic crisis in Russia and ongoing economic difficulties in Finland. Also, low world oil prices and cheaper electricity from Nordic countries have hit Estonia's mining, chemical and electricity sectors. Investment activity fell substantially, reflecting the completion of major investment projects in 2013 and 2014.

In 2015, growth was mainly driven by private consumption. Real incomes were supported by low inflation and rising wages. Income tax cuts and higher family benefits also contributed. In 2016 and 2017, growth in household consumption is projected to slow down amid rising inflation and more moderate wage growth.

For 2016 and 2017, growth is expected to rebound to 2.1 % and 2.3 % respectively, as external demand and investment recover (see Graph 1.1). However, Estonia's potential growth rate has been on a declining path as convergence with the EU average progresses. Also, lower potential output growth, in particular related to weak productivity growth, may partly reflect structural bottlenecks discussed later in this document.

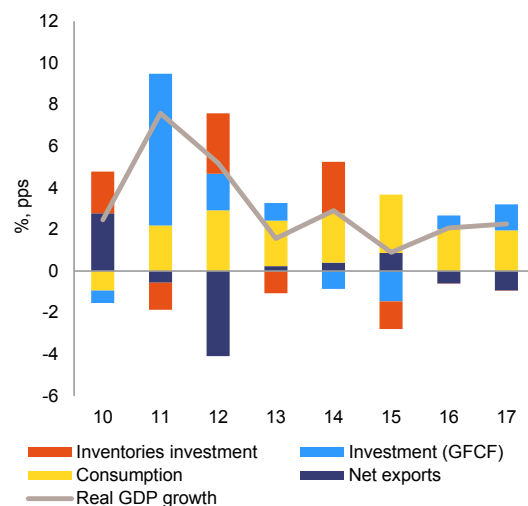
The contribution of Estonian companies to overall growth was small in 2015, but is expected to increase in 2016 and 2017. As external trade recovers, corporate investment, especially in equipment, is forecast to rebound, supported by growing demand from the euro area, favourable financing conditions and efforts by businesses to replace increasingly expensive workers with equipment. At the same time, public investment is projected to gradually start growing again over the course of 2016-2017, as EU funding begins to be dispersed under the new programming period.

Housing market and prices

House prices are expected to continue to grow in the near future, albeit at a slower speed.

Between 2005 and 2007, a major bubble affected the housing market, as huge loan financing from abroad and favourable fiscal measures fostered investment in homes. In 2008-2010, when the credit bubble burst, house prices contracted severely, but they have since recovered strongly. In 2014, deflated (also called 'real') house prices increased by 12.9 %, supported by favourable financing terms and strong wage increases. In 2015, the rise in house prices slowed down in the second half of the year, and, in 2016, moderate growth is expected to continue.

Graph 1.1: Real GDP growth and contributions



(1) Forecasts for 2015-17 based on a no-policy-change assumption

Source: European Commission

Crucially, macro-financial risks appear limited.

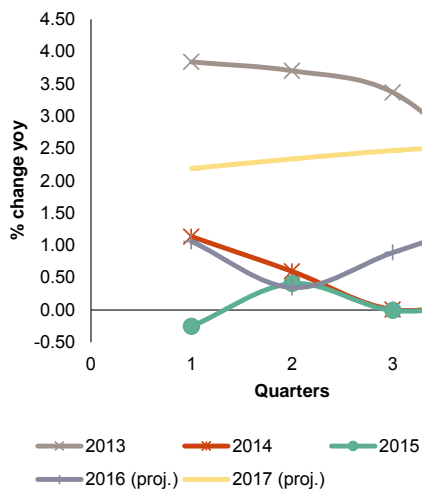
The banking sector is robust, supported by a strengthened prudential framework. Also, credit growth for mortgages remains moderate and stable, while house price increases have broadly followed wage developments. The housing market is looked at in depth in section 2.2.

Inflation

Price pressures have abated since the end of 2013, but inflation is expected to pick up (Graph 1.2). Annual inflation turned almost negative in mid-2014 and stayed only slightly above zero in 2015, reflecting steep declines in energy prices, in particular crude oil, which outweighed the impact of the depreciation of the euro. Overall, the general

price level rose by just 0.1 % in 2015. Harmonised index of consumer prices (HICP) inflation is expected to increase to 1.0 % in 2016 and 2.5 % in 2017, pushed up by several factors including excise tax increases, strong wage growth, (supported by sizeable annual minimum wage increases), and the slow recovery of commodity prices.

Graph 1.2: Quarterly HICP inflation (yoy % change)



Source: European Commission

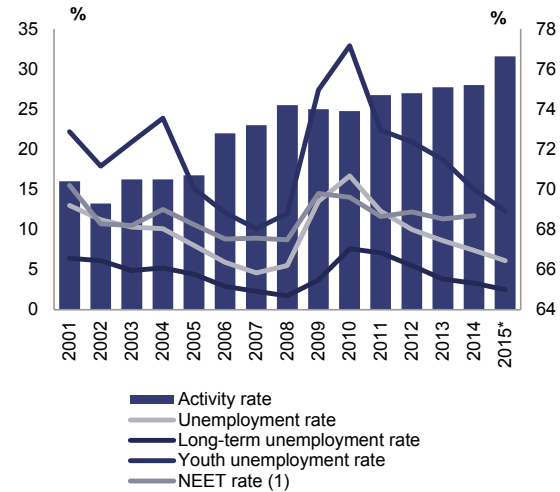
Labour market

After falling sharply in 2015, unemployment is set to rise again from early 2017, as the Work Ability reform will increase labour supply. Entrepreneurs' obligation to register their workforce was tightened in mid-2014. As a result, employment growth reached 2.3 % in 2015. At the same time, as a result of the low birth rate, Estonia's working-age population declined and unemployment fell to 6.1 %, down from 7.4 % in 2014 (Graph 1.3). In early 2017, as a result of the Work Ability reform, many current incapacity for work pensioners are expected to re-enter the labour market as jobseekers. As labour supply will expand, this may pull unemployment back up to about 7.5 % in 2017 ⁽¹⁾. Activity rates were already high at 76,6 % in 2015 (15-64 age category). In 2015, net emigration almost

⁽¹⁾ Commission's winter forecast based on Eesti Pank's estimates (see Eesti Pank (2015) Estonian economy and monetary policy, 1/2015, Bank of Estonia, Tallinn).

disappeared. Immigration is not expected to increase over the next few years.

Graph 1.3: Labour market indicators



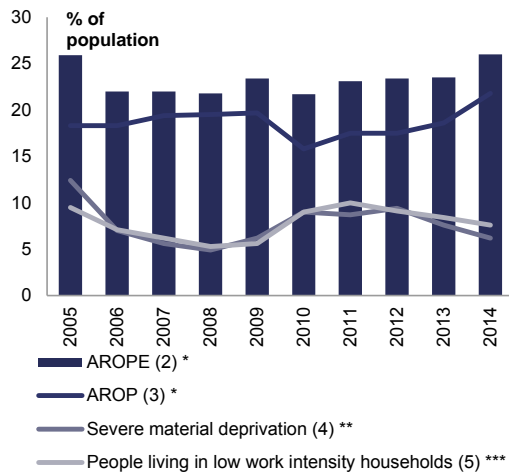
(1) NEET: not in employment, education or training.
 (*) Average of first three quarters of 2015. Data for total unemployment and youth unemployment rates are seasonally adjusted.

Source: European Commission

Unit labour costs

Unit labour costs have risen sharply over the recent years amid strong wage growth and slower productivity growth. At 13 % in the 2014 macroeconomic imbalance procedure scoreboard, the unit labour cost growth over three years in Estonia is now clearly above the usual threshold (9 %), but also above the higher threshold that is applied to non-euro area or catching-up economies (12 %). The persistent wage growth largely reflects a tightening labour market, but also catching-up effects (convergence to EU levels) and successive minimum wage increases. As, a priori, continued high wage growth can negatively affect cost-competitiveness, increases in unit labour costs need to be monitored. This issue is also looked at in depth in section 2.1.

Graph 1.4: Poverty and social indicators (1)



(1) Structural data break: Statistics Estonia has changed its data source in 2013 for calculating poverty rates.

(2) AROPE: At-risk-of-poverty or social exclusion rate (% of total population). People who are at-risk-of poverty (AROP) and/or suffering from severe material deprivation (SMD) and/or living in household with zero or very low work intensity (LWI).

(3) AROP: At-risk-of-poverty rate (% of total population). People who have an equivalised disposable income below 60% of the national equivalised median income.

(4) SMD: Severe material deprivation rate (% of total population). People who experience at least 4 out of 9 deprivations: people cannot 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

(5) LWI: People living in low work intensity households (% of population 0-59). People living in households where the adults (excluding dependent children) work less than 20% of their total work-time potential during the previous 12 months.

(*) AROPE, AROP: previous year income

(**) SMD: current year

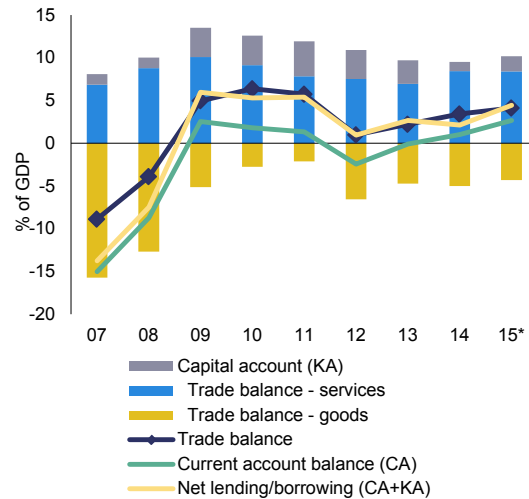
(***) LWI/JLH: previous year

Source: European Commission

Poverty and social exclusion

While the share of the population living in severe material deprivation and in households with very low work intensity is well below European averages and declining, the at-risk-of-poverty rate increased to 21.8 % in 2014, 4.6 percentage points above the EU average (Graph 1.4). This is mainly due to an increase in the median equalised disposable household income. However, not everyone is benefiting from this income growth; in particular, those who live off benefits are not (see section 3.2).

Graph 1.5: Decomposition of external position (current and capital accounts)

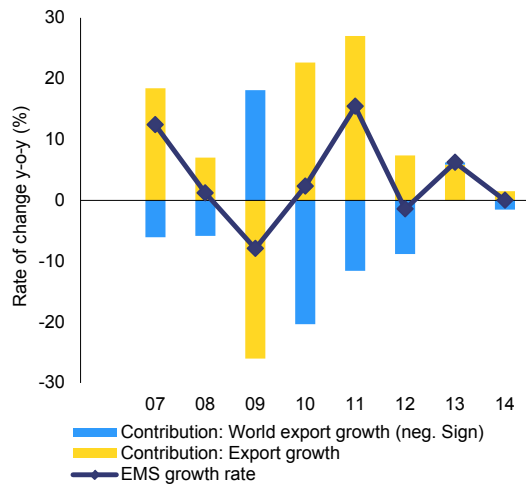


Source: European Commission - Eurostat

Current account

The current account came out of deficit in 2014 at 1.1 % of GDP and is expected to remain positive in 2016 and 2017 (Graph 1.5). The surplus mainly comes from the trade balance, especially from the still growing exports of services. Also, a decline in investment growth in Estonia in 2015 depressed import demand for goods.

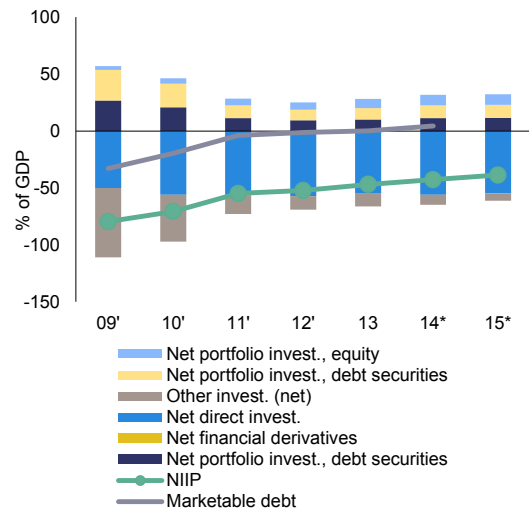
Graph 1.6: Export market share growth rate by value of goods and services



(1) EMS: export market shares
 Source: European Commission

In 2014, Estonia still gained market share in terms of export value (0.2 %) (Graph 1.6), but lost market share measured by volume (down 0.3 %). This was especially related to a strong reduction in demand from neighbouring Russia because of the rouble depreciation. At the same time, though, a reorientation of goods exports towards euro area and EU trading partners is under way. Estonia's competitiveness is looked at in depth in section 2.1.

Graph 1.7: Net international investment position (NIIP, % of GDP)

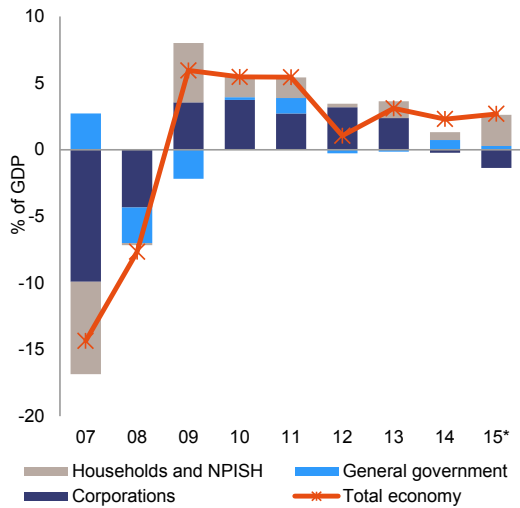


Source: European Commission

Overall external position

The negative net international investment position (NIIP) of Estonia has further receded and mostly reflects foreign direct investment (Graph 1.7). The NIIP position remained above the threshold (-42.7 % of GDP) in 2014, but has been on a declining path and is expected to continue to do so in the coming years (Graph 1.8). The country remains one of the largest beneficiaries of foreign direct investment inflows in an EU comparison, even though flows have been gradually decreasing in recent years.

Graph 1.8: Net lending/net borrowing by sector (% of GDP)



(1) NPISH: non-profit institutions serving households.

Source: European Commission

Budgetary balance

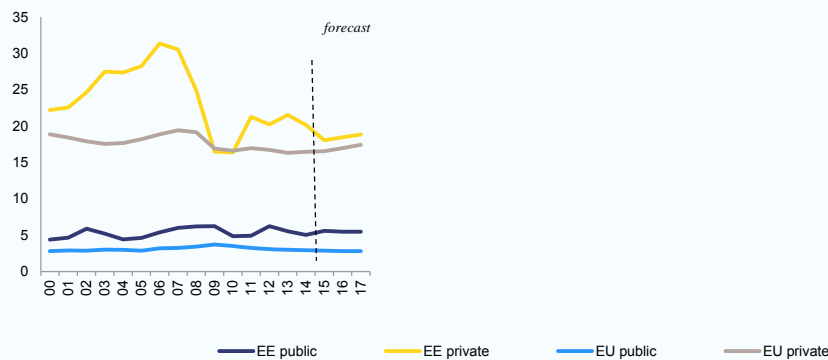
The budget is expected to have remained in surplus in 2015, with tax revenues remaining strong despite slowed down economic growth. Tax revenues were boosted by rapid wage growth, private consumption, measures to improve tax compliance and extraordinary government revenues from corporate income tax. VAT revenues showed a strong increase in recent years, from 13.5 % of GDP in 2013 to 14.4 % in 2015, mostly due to anti-fraud measures such as additional reporting requirements for business-to-business transactions. Public finances are expected to remain in slight surplus in 2016 and in 2017. In structural terms, the fiscal position is expected to also remain positive in 2015 and 2016, but to decrease to close to balance in 2017. Estonia's very low public debt is expected to fall further from 10.4 % of GDP in 2014 to about 9 % of GDP in 2017.

Box 1.1: Investment

Macroeconomic perspective

Estonia has one of the highest ratios of investment to GDP in the EU, for both the public and the private sector (see Graph 1). The private investment ratio was particularly high during the 2007 housing boom, but those levels proved unsustainable (see Section 2.2); in recent years, it has fallen, but is still above the EU average. Based on the 2016 winter forecast, the investment ratio is expected to increase slightly. Public investment has remained relatively stable over the crisis years, helped by EU funds.

Graph 1: Public and private investment as % of GDP

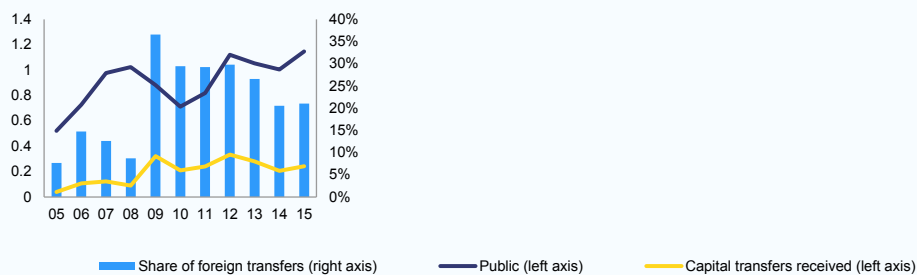


(1) Forecasts for 2015-2017 based on a no-policy-change assumption

Source: European Commission

While domestically funded public investment was cut in 2009-2010 in an attempt to balance the budget, at the same time Estonia managed to significantly accelerate the absorption of EU funds (see Graph 2).

Graph 2: General government investment (bn €) and share of foreign financing in investments



Source: European Commission

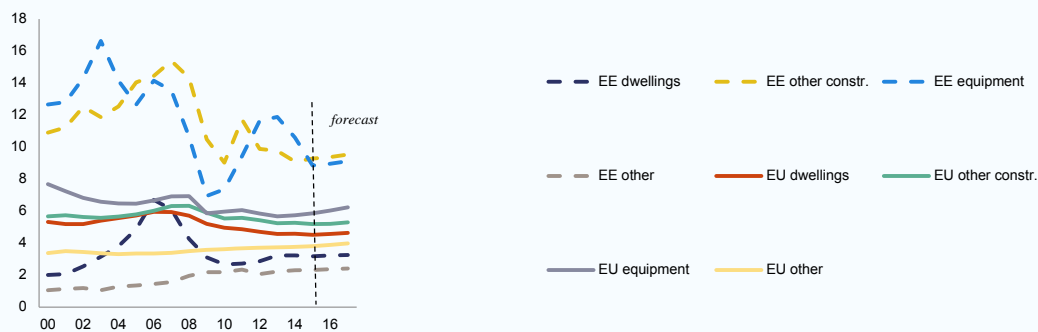
In terms of the assets invested in, Estonia invests substantially more than the EU average in 'equipment' and 'other construction' (the latter reflecting construction activity by enterprises and of infrastructure) (see Graph 3). These investment assets are crucial to expanding productive capacity, but they appear to follow a longer-term trend of slowdown. However, this is likely also linked with the economic convergence process, as the capital investment intensity of converging

(Continued on the next page)

Box (continued)

economies is typically higher than that of more developed economies, where less investment-intensive services account for a larger share of the total. Whether the recent slowdown in investment might also reflect general problems in competitiveness is further analysed in section 2.1. While investment in dwellings appears lower than the EU average, this is typically the case in regional peer countries as well. Compared with its peers, Estonia actually invests more than average in dwellings (see also Subsection 2.2).

Graph 3: Investment by type of asset as % of GDP



Source: European Commission

Structural barriers to investment

Estonia has relatively few barriers to investment, compared to most other EU countries, as outlined in the recent Commission analysis ⁽¹⁾.

Labour and skill shortages are considered a barrier to higher investment in specific sectors. Shortages of some types of skilled labour are more acute in a few sectors, for example IT workers. Estonia has been successful in attracting IT companies and demand for the relevant professionals has therefore increased. Although the number of IT employees has increased substantially in recent years, ⁽²⁾ it is hard to satisfy the rising demand for workers from the domestic labour market only.

The quality of investment (investment in activities with higher value-added) remains an issue, as investment in Estonia has been geared towards capital-intensive production with relatively low value added (see section 2.1). The Commission analysis on investment barriers highlighted limited cooperation between businesses and academia and low RDI investment. Also, financing options for riskier early-stage projects are limited (see section 3.3), but Estonia has continued to make efforts to improve these aspects.

The Commission analysis also highlighted the burdensome insolvency framework as an institutional barrier that might discourage investment. Recent improvements in the insolvency framework appear to have only partly overcome this challenge (see under section 3.5).

⁽¹⁾ Staff working document 'Challenges to Member States' Investment Environments' SWD(2015) 400 final (http://ec.europa.eu/europe2020/challenges-to-member-states-investment-environments/index_en.htm)

⁽²⁾ With 5% of the workforce (of which 3pps. in the IT sector itself), the country now ranks 4th among the Member States.

Box 1.2: Contribution of the EU Budget to structural change

Estonia is a major beneficiary of the European Structural and Investment Funds (ESIF) and can receive up to EUR 4.5 billion for the period 2014-2020. This is equivalent to 2.8% of GDP (on an annual basis) and 49% of the expected national public investment in areas supported by the ESI funds.

A number of reforms were passed as ex-ante conditionalities in areas to benefit from the Funds to ensure successful investments. Reforms in areas such as climate change adaptation, maritime transport and active inclusion are still pending and to be completed by end-2016. Where ex-ante conditionalities are not fulfilled by end 2016, the Commission may suspend interim payment to the priorities of the programme concerned.

The programming of the Funds includes a focus on priorities and challenges identified in recent years in the context of the European Semester such as prioritisation and specialisation in the research and innovation systems and the Work Ability Reform. Regular monitoring of implementation includes reporting in mid-2017 on the contribution of the funds to Europe 2020 objectives and progress in addressing relevant structural reforms to maximise the use of EU financing (notably, in the R&DI, education, and employment sectors).

Financing under the new European Fund for Strategic Investments (EFSI), Horizon 2020, the Connecting Europe Facility and other directly managed EU funds would be additional to the ESI Funds. Following the first rounds of calls for projects under the Connecting Europe Facility, Estonia has signed agreements for EUR 50 million in the energy field and EUR 192 million for transport projects. For more information on the use of ESIF in Estonia, see: <https://cohesiondata.ec.europa.eu/countries/EE>.

Table 1.1: Key economic, financial and social indicators - Estonia

	2003-2007	2008	2009	2010	2011	2012	2013	2014	forecast		
									2015	2016	2017
Real GDP (y-o-y)	8.2	-5.4	-14.7	2.5	7.6	5.2	1.6	2.9	0.9	2.1	2.3
Private consumption (y-o-y)	11.5	-4.9	-15.3	-1.6	3.7	4.4	3.8	3.5	4.8	3.2	3.0
Public consumption (y-o-y)	4.4	4.6	-3.2	-0.4	1.3	3.6	1.5	3.0	1.8	1.7	1.9
Gross fixed capital formation (y-o-y)	14.4	-13.1	-36.7	-2.6	34.4	6.7	3.2	-3.1	-5.8	2.8	5.4
Exports of goods and services (y-o-y)	13.9	0.9	-20.3	24.0	24.2	6.2	4.7	1.8	-1.5	0.9	3.8
Imports of goods and services (y-o-y)	16.1	-6.2	-30.6	21.2	27.2	11.7	4.5	1.4	-2.6	1.8	5.3
Output gap	8.0	6.1	-9.0	-6.6	-1.2	2.1	1.4	1.8	0.2	-0.2	0.0
Potential growth (y-o-y)	5.6	2.5	-0.6	-0.1	1.7	1.8	2.3	2.5	2.5	2.5	2.1
Contribution to GDP growth:											
Domestic demand (y-o-y)	10.7	-6.7	-20.3	-1.5	9.5	4.7	3.0	1.5	1.3	2.7	3.2
Inventories (y-o-y)	0.3	-3.2	-1.4	2.0	-1.3	2.9	-1.1	2.5	-1.3	0.0	0.0
Net exports (y-o-y)	-2.7	5.0	8.1	2.8	-0.6	-4.1	0.2	0.4	0.9	-0.6	-0.9
Contribution to potential GDP growth:											
Total Labour (hours) (y-o-y)	0.3	-1.1	-2.0	-1.2	-0.3	-0.5	0.0	0.3	0.5	0.4	-0.1
Capital accumulation (y-o-y)	3.4	2.5	0.7	0.6	1.5	1.6	1.5	1.2	1.0	1.0	1.0
Total factor productivity (y-o-y)	2.0	1.0	0.7	0.5	0.4	0.7	0.8	1.0	1.0	1.1	1.2
Current account balance (% of GDP), balance of payments	-12.7	-8.7	2.5	1.8	1.3	-2.4	-0.1	1.0	.	.	.
Trade balance (% of GDP), balance of payments	-8.1	-3.9	5.0	6.4	5.7	1.0	2.2	3.4	.	.	.
Terms of trade of goods and services (y-o-y)	1.7	0.2	0.4	-1.9	0.4	-0.7	1.3	1.1	0.2	0.3	0.2
Capital account balance (% of GDP)	1.1	1.2	3.4	3.5	4.1	3.4	2.8	1.1	.	.	.
Net international investment position (% of GDP)	-76.3	-75.4	-80.1	-71.2	-54.8	-50.9	-46.9	-42.7	.	.	.
Net marketable external debt (% of GDP) ¹	-15.9*	-34.7*	-33.0*	-19.6*	-3.9*	-1.3*	0.1	4.3	.	.	.
Gross marketable external debt (% of GDP) ¹	77.0	98.8	104.5	90.3	81.4	81.6	75.1	76.9	.	.	.
Export performance vs. advanced countries (% change over 5 years)	47.0	52.4	26.1	18.3	35.7	20.9	24.4	32.95	.	.	.
Export market share, goods and services (y-o-y)	9.1	0.7	-7.9	2.7	15.6	-1.5	6.2	0.2	.	.	.
Net FDI flows (% of GDP)	-6.4	-2.8	-2.4	-6.9	-10.6	-2.2	-0.5	-2.8	.	.	.
Savings rate of households (net saving as percentage of net disposable income)	-9.9	1.6	6.9	3.3	4.1	1.4	3.9	3.1	.	.	.
Private credit flow (consolidated, % of GDP)	20.1	10.5	-6.0	-7.6	-0.7	10.6	4.1	6.5	.	.	.
Private sector debt, consolidated (% of GDP)	98.8	136.6	153.2	140.4	122.9	123.2	115.8	116.1	.	.	.
of which household debt, consolidated (% of GDP)	32.6	50.4	57.0	53.4	45.6	42.1	39.8	38.9	.	.	.
of which non-financial corporate debt, consolidated (% of GDP)	66.2	86.2	96.2	87.0	77.3	81.1	76.0	77.2	.	.	.
Corporations, net lending (+) or net borrowing (-) (% of GDP)	-7.8	-4.3	3.6	3.7	2.7	3.2	2.4	-0.2	-1.4	-1.1	-1.5
Corporations, gross operating surplus (% of GDP)	32.6	28.7	25.1	29.8	32.9	32.7	32.3	30.9	27.1	26.5	26.0
Households, net lending (+) or net borrowing (-) (% of GDP)	-6.3	-0.2	4.5	1.5	1.6	0.3	1.3	0.6	2.3	2.2	1.6
Deflated house price index (y-o-y)	26.6	-16.6	-37.0	2.0	2.6	3.8	7.3	12.8	.	.	.
Residential investment (% of GDP)	4.9	4.3	3.1	2.7	2.7	2.9	3.2	3.2	.	.	.
GDP deflator (y-o-y)	7.1	7.5	0.4	1.5	5.3	2.7	4.0	2.0	1.2	2.1	2.7
Harmonised index of consumer prices (HICP, y-o-y)	3.9	10.6	0.2	2.7	5.1	4.2	3.2	0.5	0.1	1.0	2.5
Nominal compensation per employee (y-o-y)	14.8	10.6	-2.9	2.6	0.8	6.9	5.8	5.9	5.3	5.1	5.1
Labour productivity (real, person employed, y-o-y)	6.3	-5.2	-5.0	7.8	1.0	3.5	0.3	2.1	.	.	.
Unit labour costs (ULC, whole economy, y-o-y)	8.0	16.7	2.2	-4.8	-0.2	3.3	5.5	3.7	6.8	2.3	2.7
Real unit labour costs (y-o-y)	0.8	8.5	1.8	-6.2	-5.1	0.6	1.5	1.7	5.5	0.2	0.0
Real effective exchange rate (ULC, y-o-y)	6.9	12.0	1.2	-6.3	-1.8	-1.4	5.2	3.7	4.2	1.5	.
Real effective exchange rate (HICP, y-o-y)	2.3	6.5	2.0	-3.7	1.0	-0.8	2.9	2.6	0.5	2.8	-0.1
Tax wedge on labour for a single person earning the average wage (%)	20.4	17.9	18.6	19.4	19.6	19.9	19.5	19.7	.	.	.
Tax wedge on labour for a single person earning 50% of the average wage (%)	16.0*	14.3	14.8	15.5	15.9	16.6	16.4	16.7	.	.	.
Total Financial Sector Liabilities, non-consolidated (y-o-y)	26.8	4.2	-6.8	-2.6	0.3	8.3	1.3	8.6	.	.	.
Tier 1 ratio (%) ²	.	17.0	20.9	20.0	16.8	18.7	17.9	19.3	.	.	.
Return on equity (%) ³	.	15.7	-0.5	7.5	-4.0	6.5	15.3	13.1	.	.	.
Gross non-performing debt (% of total debt instruments and total loans and advances) (4)	.	2.3	8.9	9.3	4.5	3.0	1.9	2.6	.	.	.
Unemployment rate	7.8	5.5	13.5	16.7	12.3	10.0	8.6	7.4	6.3	6.3	7.5
Long-term unemployment rate (% of active population)	3.9	1.7	3.7	7.6	7.1	5.5	3.8	3.3	.	.	.
Youth unemployment rate (% of active population in the same age group)	16.4	12.0	27.4	32.9	22.4	20.9	18.7	15.0	.	.	.
Activity rate (15-64 year-olds)	71.6	74.2	74.0	73.9	74.7	74.8	75.1	75.2	.	.	.
People at-risk poverty or social exclusion (% total population)	24.1	21.8	23.4	21.7	23.1	23.4	23.5	26.0	.	.	.
Persons living in households with very low work intensity (% of total population aged below 60)	8.1	5.3	5.6	9.0	10.0	9.1	8.4	7.6	.	.	.
General government balance (% of GDP)	2.2	-2.7	-2.2	0.2	1.2	-0.3	-0.1	0.7	0.3	0.2	0.1
Tax-to-GDP ratio (%)	30.8	31.6	35.1	33.5	31.7	31.6	31.6	32.2	33.9	33.9	33.8
Structural budget balance (% of GDP)	.	.	.	0.1	0.2	-0.2	-0.6	0.1	0.5	0.3	0.1
General government gross debt (% of GDP)	4.7	4.5	7.0	6.6	5.9	9.5	9.9	10.4	10.1	9.8	9.4

(1) Sum of portfolio debt instruments, other investment and reserve assets

(2,3) domestic banking groups and stand-alone banks.

(4) domestic banking groups and stand-alone banks, foreign (EU and non-EU) controlled subsidiaries and foreign (EU and non-EU) controlled branches.

(*) Indicates BPM5 and/or ESA95

Source: European Commission, winter forecast 2016; ECB

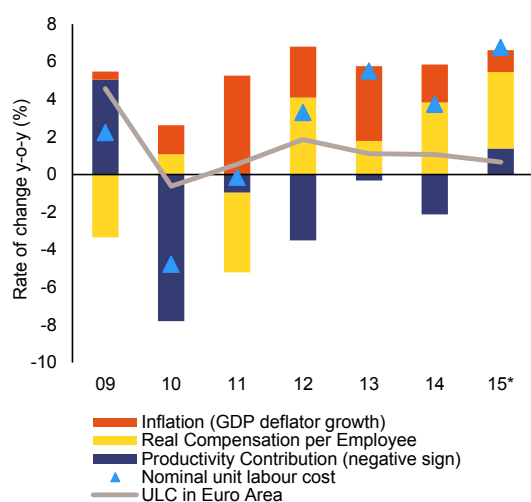
2. IMBALANCES, RISKS, AND ADJUSTMENT ISSUES

This section provides the in-depth review foreseen under the macroeconomic imbalances procedure (MIP) ⁽²⁾. It focuses on the risks and vulnerabilities flagged in the Alert Mechanism Report 2016. The section analyses the reasons behind the rising unit labour costs and housing prices, two possible signs of domestic overheating exposing the country to possible competitive losses and disorderly correction with harmful implication for the real economy. This section first analyses the main drivers of the cost-competitiveness developments and non-cost competitiveness developments in Estonia's economy. Second, as Estonian house prices have grown at the fastest pace in the EU in recent years, the section explores the drivers of the Estonian housing market. It also assesses the outlook for real-estate developments, including possible spillover risks from the real-estate sector to economic and financial sector stability. The section concludes with the MIP assessment matrix which summarises the main findings.

2.1. COMPETITIVENESS DEVELOPMENTS

Over the 2012-2014 period, Estonia experienced a 13 % cumulative increase in unit labour costs (Graph 2.1.1). A priori, a continued increase in unit labour costs could reduce cost competitiveness and weaken Estonia's external position. It could also weaken the country's corporate profit margins, leading to a decrease in investment and lower future potential growth. Together with rising house prices, persistently rising unit labour costs also points to possible signs of overheating.

Graph 2.1.1: Breakdown of changes in unit labour costs (ULC)



* refer to the ECFIN Winter Forecast 2016

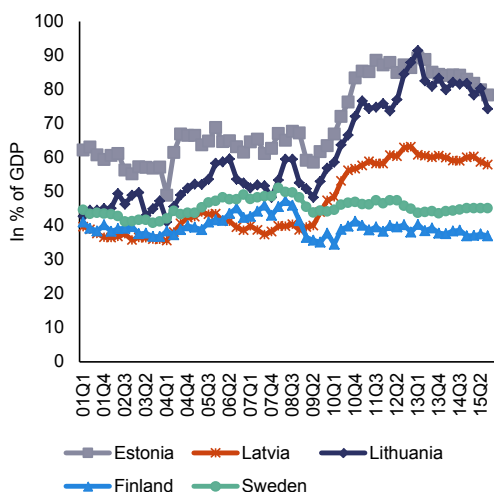
Source: European Commission

Unit labour costs developments depend on two factors: nominal wages and productivity. It is important to have look in depth at both of these in order to single out any potential loss of competitiveness from the normal economic adjustment process. This also means analysing the non-cost competitiveness issues for the Estonian economy. By putting these elements together, and looking more closely at actual export performance in recent years, one can determine whether the developments in unit labour costs pose a risk to the long-term performance of the Estonian economy.

Estonia is a small and very open economy, making it flexible, but also volatile and vulnerable to foreign trade developments. After the credit bubble burst in 2008-2009, the sharp fall in domestic demand freed up production capacity, in particular labour, which led to productivity gains and a downward correction to wages. This allowed large cost-competitiveness gains to be made and production to be redirected towards exports, which increased sharply in the years following the crisis (Graph 2.1.2). This underlines the importance of exports and thus of competitiveness and changes in unit labour costs.

⁽²⁾ According to Article 5 of Regulation (EU) No 1176/2011.

Graph 2.1.2: Exports of goods and services (in value) in % of GDP: openness of Estonia, Latvia, Lithuania, Finland and Sweden

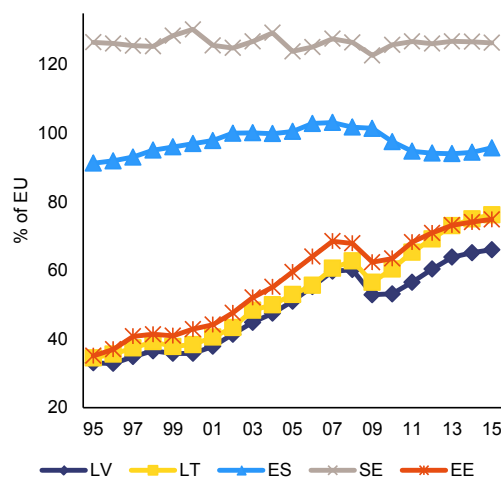


Source: European Commission - Eurostat

Wage dynamics and cost competitiveness

The main driver of the increase in unit labour costs in recent years has been buoyant wage growth. In 2014, nominal wage growth reached 5.9 %, the second highest in the EU and similar to that in 2013. While for 2015 some deceleration, to 5.3 %, is expected, this would still be the second highest rate in the EU. Taken at face value, the strong wage increase, which has been consistently above productivity growth in recent years, shows a worrying trend. But these developments have to be seen in the specific context of the Estonian economy.

Graph 2.1.3: Convergence in income per capita in purchasing power standards (PPS): Estonia, Latvia, Lithuania, Spain, Sweden



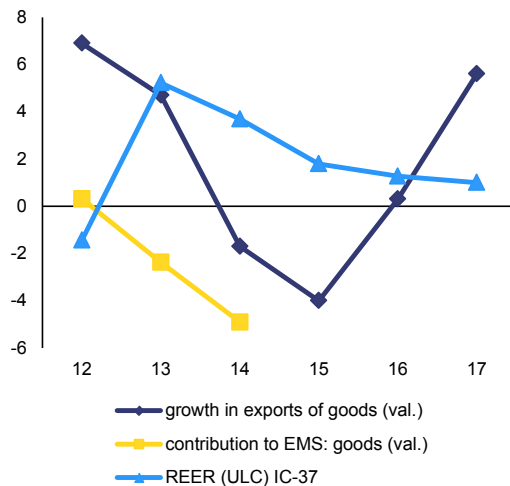
Source: European Commission - Eurostat

Estonia is a catching-up economy. In purchasing power standards, Estonian income per capita has increased from about 35 % of the EU average in the late 1990s to about 75 % in 2015. This implies that there is still ample room for further income convergence (Graph 2.1.3). This process is broadly in line with the other Baltic countries.

Converging economies typically experience high real and nominal growth ⁽³⁾. This implies that nominal unit labour costs are likely to grow faster in Estonia than in more advanced EU economies. In 2015, Eesti Pank (Estonia's central bank) estimated the overall impact from price convergence on wages in recent years at around 1.5 percentage points. The impact is expected to decline over time, as convergence progresses.

⁽³⁾ Galdikiene and Maciulis (2013) estimate the elasticity linking relative price and income levels over the 1995-2011 period at between 0.76 and 0.81 %, depending on the price level index used (GDP deflator or CPI). See Galdikiene, L. and Maciulis, N. (2013) in 'What drives inflation in the Baltic countries?', Swedbank analysis, Swedbank Macro Research, Stockholm, June 2013.

Graph 2.1.4: Growth in exports of goods by value, contribution to export market share for goods, real effective exchange rate (REER)



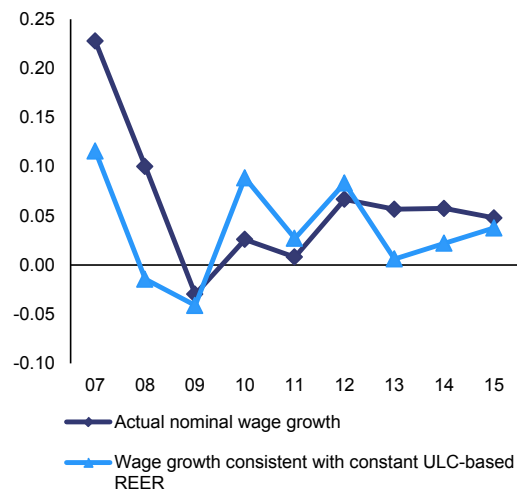
(1) EMS: export market shares
 (2) REER (ULC): real effective exchange rate based on unit labour costs
 (3) IC-37: towards 37 industrial countries
 Source: European Commission

In 2015, unit labour costs growth was only slightly above the level that ensured unchanged external competitiveness in 2015⁽⁴⁾. The real effective exchange rate based on unit labour costs [REER (ULC)] shows changes in Estonia's unit labour costs relative to those in trading partners and is therefore a common measure for external cost competitiveness. A rise in the real effective exchange rate can translate into a loss in export growth and so contribute to a loss of export market share (Graph 2.1.4)⁽⁵⁾. In both 2013 and 2014, the actual nominal wage growth was above the rate that ensures unchanged external competitiveness (Graph 2.1.5), but, in 2015, this gap significantly narrowed.

⁽⁴⁾ Arpaia A. and Kiss A., (2015), Benchmarks for the assessment of wage developments, DG EMPL, Analytical Web Note 2/2015.

⁽⁵⁾ According to the ECB's CompNet research network, a rise of 1% in REER (ULC) would translate into a loss of 1 pp. in export growth of goods (Eesti Pank, 2015).

Graph 2.1.5: Actual nominal wage growth and expected wage growth at constant ULC-based REER



Source: European Commission

The sectoral approach

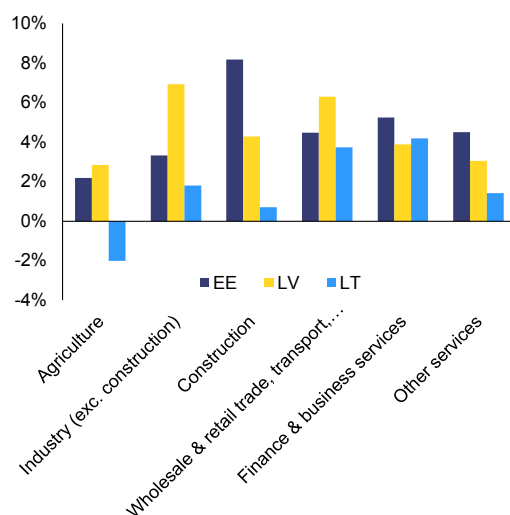
Two sectoral factors affecting wages and nominal unit labour costs are also at play: the Balassa-Samuelson effect and structural shifts between and within sectors.

In transition economies, part of the catching-up process is generally reflected in fast wage growth in the tradable sector, which is transferred to the whole economy via competition in the labour market. Lower productivity in the non-tradable sector then pushes up nominal unit labour costs (Graph 2.1.6). This is the so-called Balassa-Samuelson effect. This effect has also been visible in Estonia, where average nominal unit labour costs growth is to a large extent driven by the non-tradable sector. This generally poses a lower direct risk to competitiveness, as in theory only the cost/price ratio of non-tradable sectors is affected.

Several studies have confirmed the existence of a Balassa-Samuelson effect in Estonia and estimated its overall impact on costs and prices as relatively large. In terms of the price effect only, the Balassa-Samuelson effect is estimated to explain 31% of consumer price index inflation differentials vis-à-vis the euro area and 36% of overall domestic inflation on average over the

period 1997 to 2008 ⁽⁶⁾. During the 2009-2010 crisis, however, the effect was barely visible given the sharp rise in world commodity prices, which led to high inflation in the tradable sector. As income in Estonia progressively rises, the weight of services in the consumer basket has gradually increased (from 15 % in 1998 to about 30 % in 2015), which would amplify the Balassa-Samuelson phenomenon.

Graph 2.1.6: Growth in nominal unit labour cost by sector from 2011 to 2014



Source: European Commission – Eurostat

Over the past decade, and in line with its profile as a catching-up economy, Estonia has seen employment shifts away from low value-added towards higher value-added activities. Agriculture lost 32 % of its workforce, mining 47 %, manufacturing of textiles and leather about 60 %. At the same time, high-skilled services such as information and communication technologies and professional, scientific, technical and business support activities expanded their workforce by 59 % and 85 % respectively. These employment

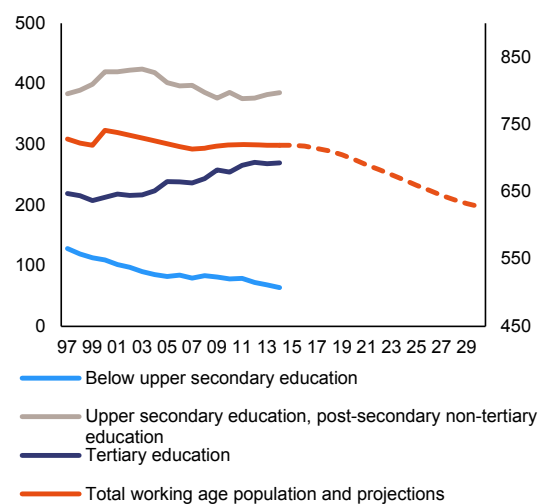
⁽⁶⁾ Egert, B. (2007) 'Real convergence, price level convergence and inflation differentials in Europe', CESIFO, Working Paper, No 2127, October 2007; Mihaljek, D. and Klau, M. (2008 and 2009) 'Catching-up and inflation in transition economies: the Balassa-Samuelson effect revisited', Bank for International Settlements, Basle, December 2008; Staehr, K. (2010) 'Inflation in the new EU countries from Central and Eastern Europe: theories and panel data estimations', Working Paper Series, No 6, Bank of Estonia, 2010; Galdikiene, L. and Maciulis, N. (2013) see footnote (2). The overall impact on wages is expected to be even larger.

shifts between sectors brought wage growth of about 0.4 percentage points per year on average over 2008-2011 and 0.2 percentage points per year over 2011-2014 ⁽⁷⁾.

Within sectors, shifts from low-skilled towards high-skilled occupations and better-paid activities annually added 0.7 percentage points to average wage growth in recent years (Eesti Pank, 2015). This suggests that Estonia is moving upwards in the value chain. This also partly reflects a gradual replacement of older workers by younger, higher-skilled workers (Graph 2.1.7).

A shift to higher value-added sectors or jobs implies more efficient use of labour resources and increasing productivity growth in qualitative terms. From that perspective, wage increases do not signal a loss in competitiveness, but a shift to higher-value competitive markets.

Graph 2.1.7: Working age population (25-64) by educational attainment level and projections for 2016-2030 (in thousands)



Source: Statistics Estonia

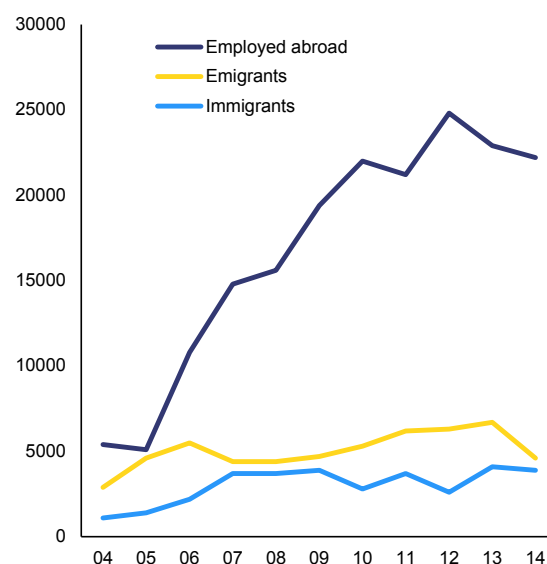
Impact of Finland

In 2013, 3.5 % of the labour force worked outside Estonia by commuting regularly to Finland while remaining resident in Estonia (Graph 2.1.8). On top of that, Finland absorbs 60 % of all genuine Estonian emigration. The reason is a combination of factors such as

⁽⁷⁾ Commission's staff calculations.

geographical and linguistic proximity and an strong Estonian community already established in the country. This, combined with more attractive working conditions in Finland, reduces the labour supply domestically and exerts upward pressure on wages in Estonia, affecting competitiveness. However, as a large part of the foreign-based workers still reside in Estonia, they increase household income, and thus consumption and economic growth. Net emigration, however, substantially declined in 2015, reflecting both the ongoing income convergence and the weak economic developments in Finland⁽⁸⁾.

Graph 2.1.8: Estonian residents employed abroad, emigrants and immigrants, 2004-2014



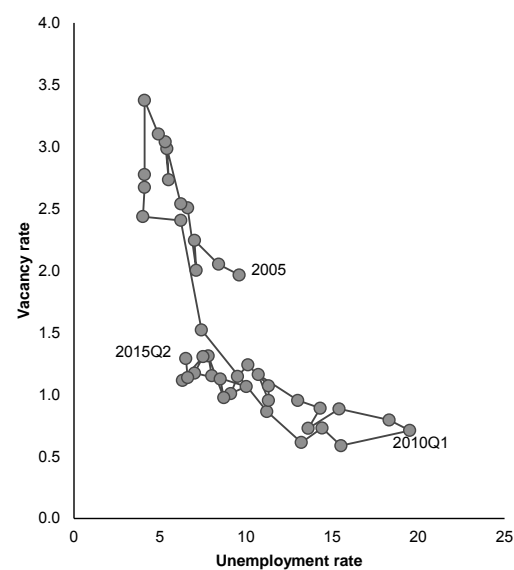
Source: Statistics Estonia, Estonian Labour Force Survey, migration statistics

While the construction sector in particular has seen an increase in unit labour costs as a result of income convergence with Finland, this sector currently does not show any sign of stress. Even with high labour costs, profit margins in the real-

⁽⁸⁾ A lower income level in the source country (given destination-country income) has been shown to increase migration (see e.g. Westmore, B. (2014) 'International migration: The relationship with economic and policy factors in the home and destination country', OECD Economics Department Working Paper No 1140). The incentive to leave is exacerbated by Estonia's poor social safety net (Tarum, H. (2014) 'Migration Potential of Working-Age Population in Estonia in 2013', Sotsiaal Ministeerium, Policy Analysis No 2/2014). See also Durán J. *et al.* (2015) 'Emigration of the less-skilled: the role of incentives to work in Estonia', *Country Focus*, Volume 12, Issue 3, ECFIN, European Commission, March 2015.

estate sector remain favourable (see section 2.2). Commuting and migration to Finland are dominated by low- or medium-skilled workers⁽⁹⁾. This may at least temporarily constrain the overall supply of these categories of workers in Estonia. It could also have contributed to the aggregate upward occupational shift referred to above.

Graph 2.1.9: Relationship between unemployment and the job vacancy rate (Beveridge curve)



Source: European Commission – Eurostat

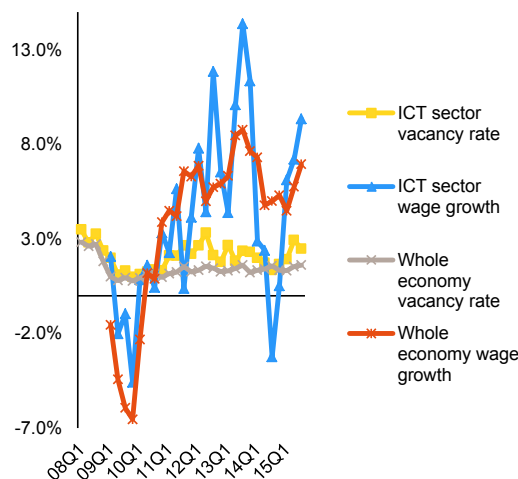
Wage flexibility

Wages in Estonia have proven to be very flexible. As in the other Baltic countries, there does not seem to be a zero-bound for the downward revisions of real or even nominal wages. This is in part related to the fact that Estonia has one of the most decentralised labour markets in the EU, with relatively low employment protection legislation compared with the EU average. Collective bargaining (not only over wages, but over other aspects of working conditions such as working time, paid holidays, training, workplace safety etc.) takes place mainly at company level, in contrast with most other Member States where some higher-level coordination (at industry or at national level) occurs.

⁽⁹⁾ Those in construction, accommodation and catering, healthcare and social welfare, manufacturing, and transport (Tarum, H. (2014) see under footnote (7)).

This is reflected in an efficient labour market, without major matching problems currently, as highlighted by the stable performance of the Beveridge curve (Graph 2.1.9). The curve also shows the swift recovery of the labour market after the crisis. In the particular case of the ICT sector, where vacancy rates have remained high in recent years, it is still small (see also Box 1.1 in section 1) and so has a limited impact on overall wage growth in Estonia. Also, since 2011, ICT wage growth (5.7 %) has been broadly equivalent on average to that of the whole economy (6.1 %), even though the volatility of both vacancy rates and wage growth in the sector has been generally higher (Graph 2.1.10).

Graph 2.1.10: Vacancy rate and wage growth in the ICT sector and in the whole economy



Source: Statistics Estonia

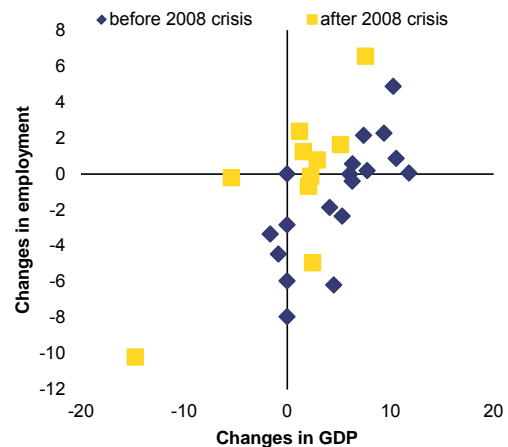
The relationship between employment creation and GDP growth has improved in recent years.

After the 2008 crisis, employment reacted more clearly and more strongly to GDP growth than before the crisis. In other words, the rise in unit labour costs in recent years has not hampered the recovery in employment (Graph 2.1.11).

The minimum wage has been increasing fast (see section 3.2). This could reduce the downward flexibility of the wage setting mechanism and may put pressure on overall cost competitiveness. However, as it is increasing from relatively low

levels and as coverage remains low, no significant impact on employment is expected⁽¹⁰⁾.

Graph 2.1.11: Relationship between employment creation and GDP growth (Okun Law)



Source: European Commission

However, the authorities have recently embarked on significant labour tax reform that is expected to increase labour supply and corporate competitiveness (see also under section 3.2). These reforms are expected to have an attenuating effect on wage growth. They are also expected to contain the future need to further increase the minimum wage, as reducing lower-rate taxes on labour also leads to higher living standards for low-income earners. Finally, wage growth is expected to slow in the coming years, as public sector wage policy provides for wage moderation at central government level.

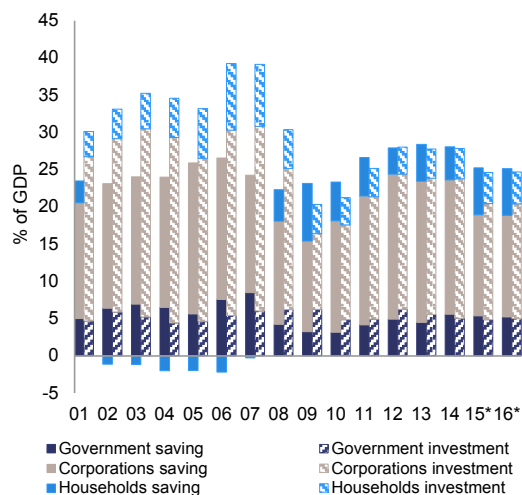
Productivity

Unit labour costs growth can be mitigated through productivity gains but these have been relatively slow in recent years. In 2013, labour productivity per hour worked was still 40 % below the EU average. Despite above EU-average education levels, the capital stock per worker was still relatively low at 85 % of the EU average, hindering productivity. While capital deepening was the major growth driver up to 2012 (accounting for 2.5 percentage points of an average of real GDP growth of 4.1 % in 2001-2012), it has

⁽¹⁰⁾ Duran J. *et al.* (2015) see under footnote (7).

not yet led to a significant increase in productivity through technological developments.

Graph 2.1.12: Saving and investment by sector - Estonia



(*): projections

Source: European Commission

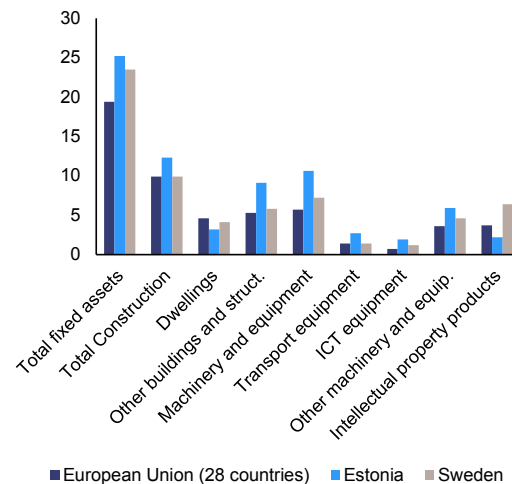
Investment

Investment levels have remained high, despite being negatively affected by weak foreign demand, lower disbursements of EU funds and deleveraging, both active (via macro-prudential measures) and passive. At 25.2 % of GDP in 2014, Estonia's overall investment growth was still the highest in the EU. In 2015, investment growth slowed down moderately, reflecting still relatively weak capacity utilisation (71 %) and industrial confidence below the long-term average. Lack of demand appears to be the main concern of entrepreneurs when making investment decisions — cited five times more than the lack of a qualified labour force ⁽¹¹⁾. This is confirmed by rather low order books as regional demand from neighbouring Finland and Russia remains weak. At the same time, new orders from other euro area countries have been quite strong. Low disbursement of EU funding under the new programme also played a role. At the same time, deleveraging continued, reflecting caution on the part of banks and businesses, as well as binding macro-prudential measures (Graph 2.1.12). The downwards trend in corporate profitability could

⁽¹¹⁾ Estonian Institute of Economic Research, <http://www.ki.ee/en/index.html>.

also partly be seen as a sign of the ongoing convergence with more advanced economies.

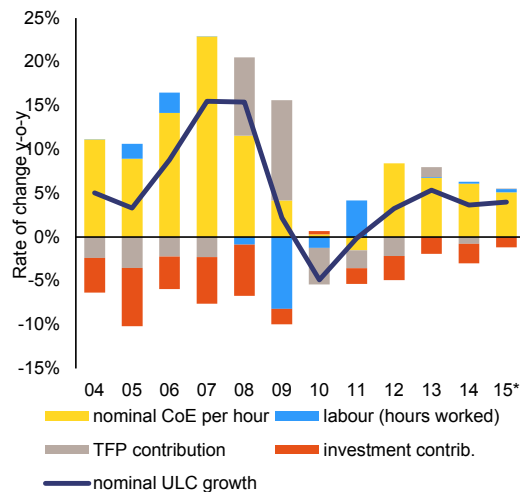
Graph 2.1.13: Gross fixed capital formation by asset type



Source: European Commission - Eurostat

However, investment growth is still dependent on capital-intensive production with relatively low value added, which limits productivity growth. Despite higher investment levels in Estonia than in its Baltic neighbours, the productivity growth figures are similar, suggesting a lower level of return on investment. Between 2010 and 2014, more than half of the country's investment was still in the construction sector. At the same time, the low level of investment in intellectual property products (2.1 % of GDP in 2014) suggests inefficient allocation of funds (Graph 2.1.13). As a result, the contribution of technological development (total factor productivity) to nominal unit labour costs growth was very low in both 2013 and 2014 (Graphs 2.1.1 and 2.1.14). There was room for improvement through better allocation of investment, supporting an economic shift to higher value added and higher productivity.

Graph 2.1.14: Rate of change of nominal ULC broken down by growth accounting contributor



(1) CoE: average nominal compensation per employee per hour

Source: European Commission

While overall foreign direct investment is relatively high, it does not seem to be supportive of high value added sectors. Estonia remained one of the biggest beneficiaries of foreign direct investment both in stock and in inflow, with respective levels of 98.7 % and 5.9 % of GDP in 2014, far above its two Baltic peers. Initially the process of privatisation and low labour costs attracted investment into public utilities and manufacturing. Later, taking advantage of the Baltic's geographical location, further foreign direct investment went to the trade and logistics sectors. Since the beginning of 2000, the bulk of foreign investment has been channelled into financial services and real estate ⁽¹²⁾.

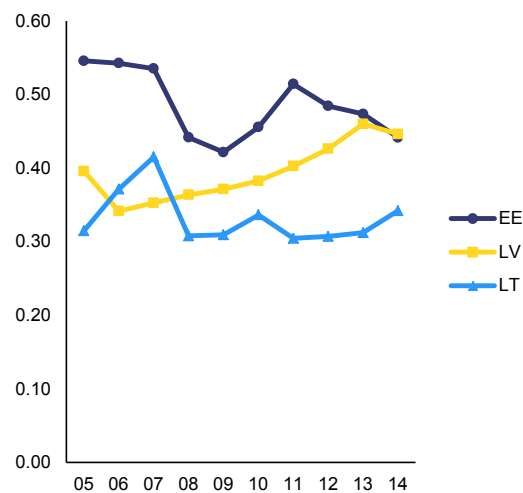
Technological development

At 70 % of the EU average in 2013, technological development (total factor productivity) was still the weakest component of GDP. While Latvia and Lithuania achieved the highest rates of technological development among Member States, over 1995-2014, Estonia's level was similar to that of the other transition Member States.

⁽¹²⁾ Grigonyte, D. (2010) 'FDI and structural reforms in the Baltic States', Country Focus, Volume 7, Issue 5, ECFIN, European Commission, July 2010.

Beyond the progressive completion of the convergence process, the lower contribution of total factor productivity to growth points mainly to problems with capacity to produce innovation and efficiency gains. This is particularly the case in the manufacturing sector, where Estonia's productivity gap with the more advanced Member States seems to be the largest. Although public R&D investment remained relatively steady over time, business R&D investment continued its downward trend from 1.2 % of GDP in 2012 to 0.6 % in 2014. Further analysis is provided in section 3.3.

Graph 2.1.15: Change in average quality rank over time for Estonia, Latvia and Lithuania for manufactured goods (1)



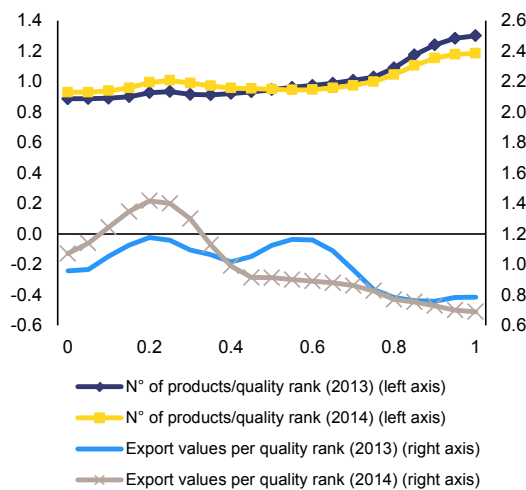
(1): combined nomenclature CN8

Source: European Commission calculations, based on the methodology of Vandenbussche, H. (2014) 'Quality in exports', Economic Papers 528, European Economy, September 2014

Non-cost competitiveness developments

To assess whether the strong wage growth and limited investment in technological development harm competitiveness, it is necessary to analyse non-cost competitiveness factors. Improvements in non-cost competitiveness can offset any loss in price competitiveness.

Graph 2.1.16: Quality density function per quality rank



A quality rank of 1 reflects the highest quality in the EU market for a particular "country of origin-product", while a rank of 0 is the lowest quality rank.

Source: European Commission based on COMEXT and Orbis

Between 1996 and 2011, Estonia was one of the EU's best performers in terms of gains in market share, thanks to large quality gains, and especially a gradual shift upwards in the global value chain⁽¹³⁾. This is to be expected from a catching-up economy. However, a distinction needs to be made between goods and services.

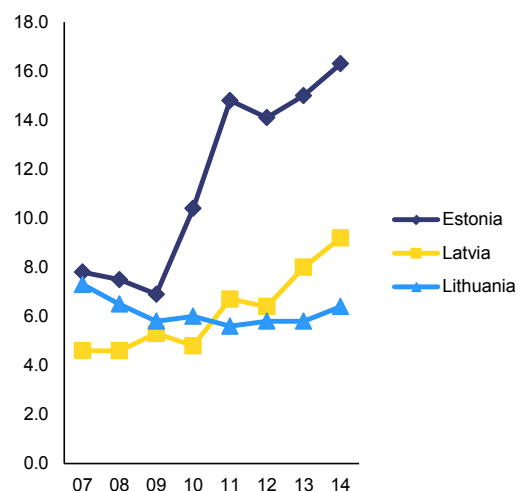
In manufactured goods, over the last decade but especially in the last four years, Estonia's export structure has shifted towards lower-value goods or lower 'quality ranks' in relative terms (Graph 2.1.15)⁽¹⁴⁾. Following a brief recovery after the 2008-2009 crisis, the structure or 'quality rank' of the manufactured goods exported by Estonia has continuously declined in relative terms. This loss of quality rank affected the total value exported by quality rank (Graph 2.1.16). The export structure loss partly reflects, in relative terms, the growing share of products and exports of lower quality ranks (e.g. wood products, etc.), but also a relative decline in the number of higher

⁽¹³⁾ Wörz, J. 2015 'Non-price components of market share gains — Evidence for EU countries, CEEI-CFEE — Warsaw, Foreign Research Division, OeNB, Vienna, October 2015. .

⁽¹⁴⁾ The exported value of Estonia's higher quality products has declined (and that of lower quality products has risen) in relative terms, i.e. when comparing them with the exports of the country's trade partners or competitors. (Vandenbussche, H. (2014) see Graph 2.1.15).

quality rank products and exports. This highlights the particular importance for Estonia of appropriate strategic investment in R&D, especially at a time when the country's shale oil sector faces serious sustainability risks. **However, when services are added to higher-tech exports, Estonia appears to be performing far better than its Baltic neighbours.** This likely reflects Estonia's strategy of promoting and developing investment in ICT services, one of its smart specialisation areas for R&D investment (Graph 2.1.17).

Graph 2.1.17: High tech trade's share of total exports of goods and services (in %)

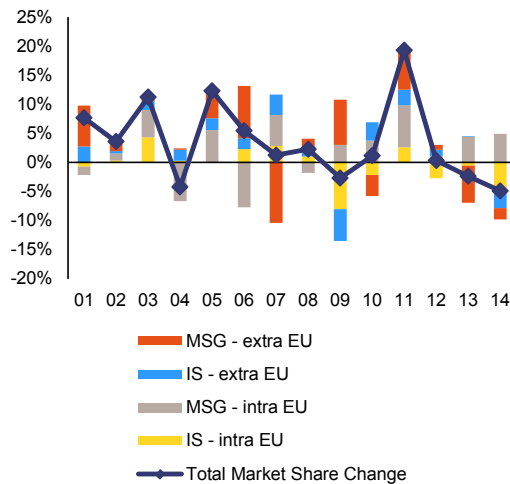


Source: European Commission - Eurostat

Trade and foreign demand

Since 2012, Estonia has lost market share in goods, even without taking into account the impact of trade sanctions with Russia in 2014. From 2010 to 2012, Estonia had managed to gain market share in both value and volume terms, while achieving sizeable productivity gains in 2010. In both 2013 and 2014, its market share for goods fell, even when bilateral trade with Russia is not counted (Graph 2.1.18). Given the lower export values for higher quality products, and apart from the lack of investment in these quality products, there might be an incipient loss of cost competitiveness for such goods. However, exports of services compensated, allowing Estonia to keep its overall trade balance positive over the period (see also 'Specialisation patterns', below).

Graph 2.1.18: Change in export market shares for goods intra-/extra-EU by value of goods



(1) MSG: market share gains

(2) IS: initial specialisation

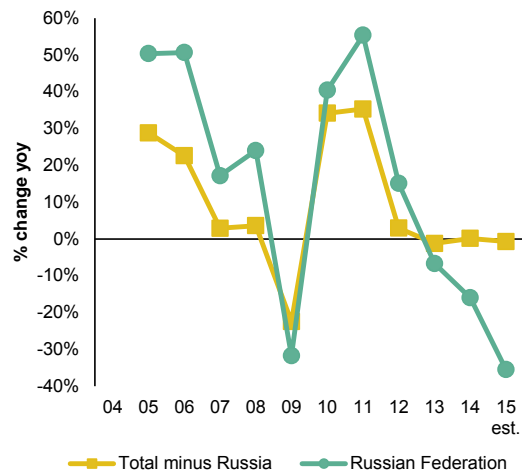
Source: European Commission

Weak foreign demand and mutual trade sanctions with Russia

The collapse of trade with Russia is one of the main factors behind exports deceleration (Graph 2.1.19). Beyond the regional geopolitical difficulties already mentioned, a sharp depreciation of the Russian rouble in late 2014-early 2015 considerably reinforced the decline in export to Russia. In 2013, the share of Estonia's exports of goods to Russia was 12 % of Estonia's total goods exports. In 2015, this percentage dropped to 7 % and there is no sign of a reversal so far ⁽¹⁵⁾.

⁽¹⁵⁾ Transit trade of goods to Russia also declined as new Russian ports developed on the Gulf of Finland. This is not reflected in Graph 2.1.19. However, exports of transport services also declined as a result (see under 'Specialisation pattern' in services).

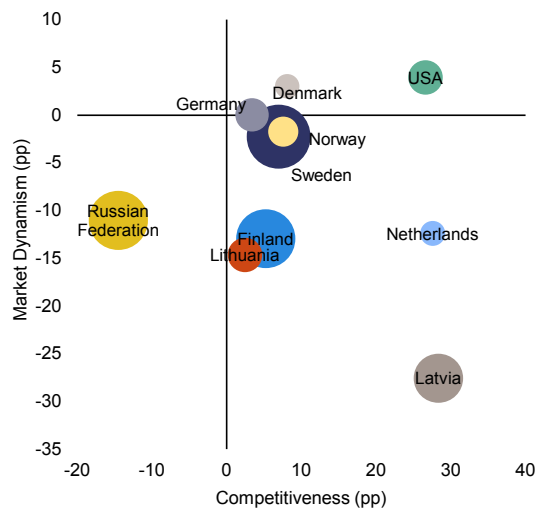
Graph 2.1.19: Estonia's export growth by value of goods to the Russian Federation and to the rest of the world



Source: Statistics Estonia

Weak demand from the other major trading partners put further pressure on the export performance. In 2014, most of the main trading partners of Estonia appeared to lack market dynamism, with overall weak demand in these countries, not just for Estonian products. Surprisingly, the competitiveness of Estonia towards a number of them clearly improved (see Graph 2.1.20). Overall, in 2014, the geographical breakdown approach pointed to large export losses towards Russia and two Member States (Finland and Lithuania). These losses were partly compensated (80 %) by export gains in several Member States (including Belgium, Denmark, Germany, Hungary, Latvia, the Netherlands, Poland, Spain, Sweden) and in Norway.

Graph 2.1.20: Export competitiveness of Estonian goods vis-à-vis top-10 destinations (2013-2014) (1)



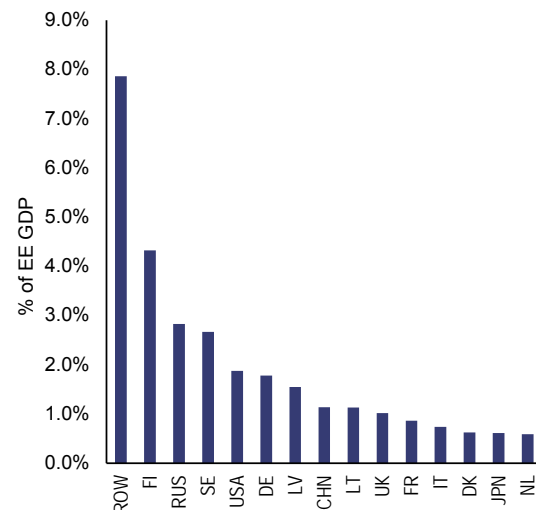
(1): The size of the bubbles indicates the weight of the destination in Estonia's total exports in 2014. Market dynamism stands for the difference between the annualised growth rates of world imports (WI) (proxied by world exports (WE)) per market and global WI (proxied by WE). Competitiveness stands for the difference between the annualised growth rates of Estonian exports per market and WI (proxied by WE) per market.

Source: European Commission

Possible inward spillover effects

Finland and Russia account for a large share of the added value of exports, making Estonia's economy vulnerable to spillover effects. In 2011, Estonia exported, directly or indirectly, more than 7 % of its value added (in value) to these two countries taken together. Graph 2.1.21 indicates that, in 2011, a decline by 50 % in Estonia's exports to Russia would have had an impact on the country's output as large as 1.4 percentage points of GDP. Between 2011 and 2015, exports of goods to Russia declined by 41%.

Graph 2.1.21: Exported value added by destination (2011)



(1) ROW: rest of the world

Source: WIOD database, IMF, European Commission calculations based on the methodology of Koopman, Wang and Wei (AER, 2014)

Specialisation pattern

In 2014, and relative to the world, Estonia appeared still relatively specialised in a number of labour-intensive areas, such as metals, stones, textiles, wood pulp, paper and furniture. However, in 2013 and 2014, for a number of these (e.g. metals and textiles), the country's exports contracted. At the same time, exports in less labour-intensive subsectors expanded (e.g. in computer electronics, pharmaceuticals, printing, machinery and vehicles), by 5 %. These subsectors represented 22 % of Estonia's total exports. The overall export balance (by value) was only slightly positive, as exports of chemicals and vehicles to Russia fell. Overall, the country has become a net exporter of intermediate (semi-finished) goods and has largely reduced its dependence on capital goods (equipment). Simultaneously, it expanded its already large market share in the labour-intensive wood sector. The latter, however, shifted towards higher value-added products such as prefabricated wooden houses (a niche market). Overall, Estonia's position within the global value chain did not seem to deteriorate.

Estonia's exports of services are diverse (construction, transport, telecommunications, tourism, ICT and business services) and their

global market shares are increasing. Over the years, services have played a major role in balancing Estonia's external trade. But even in services, it was still specialised (relative to the world) in relatively labour-intensive activities such as construction and transport. Its specialisation in transport activities, partly related to transit trade with Russia, considerably decreased, as new Russian ports on the Baltics developed and regional geopolitical difficulties emerged. In 2014, transport and storage activities remained the largest service export, but barely expanded year-on-year. Meanwhile, exports in information and communication services, professional, scientific and technical services, and administrative and support services already accounted for a relatively large share of the total (29 %) and were expanding relatively fast.

swifter progress on productivity, in particular on investment in R&D, innovation and intellectual property products ⁽¹⁶⁾.

Outlook

Unit labour costs in Estonia have rapidly increased in recent years, driven by strong wage growth, but the process has been accompanied by significant structural changes in the economy. Furthermore, the country's current-account balance is still positive and the balance of trade in goods and services does not point to imbalances. Looking ahead, nominal wage growth is expected to decrease, as labour supply benefits from the downturn in Finland and the upcoming Work Ability reform. Nevertheless, the latter could also dampen labour productivity growth as many people are returning from long-term unemployment or inactivity and may not sufficiently contribute to high value-added industries.

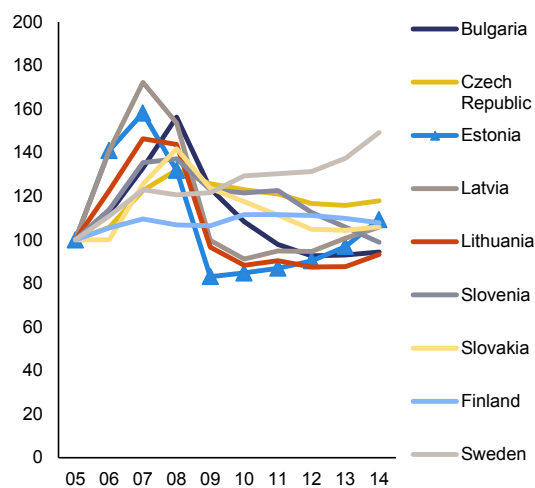
Developments in the external balance do not raise immediate concerns, except possibly for goods. The recent drop in exports of goods largely reflects anaemic foreign demand from weak Russia and Finland. After several years of swiftly climbing the technology ladder, Estonia does not appear to be moving swiftly upwards within the global value chain in goods but is steadily improving in services.

The relatively slow productivity growth, and in particular the lack of investment in R&D, is a source of concern. This, together with the latest signs of a relative loss in quality in exports of manufactured products, highlights the need for

⁽¹⁶⁾ See also: Staehr, K. (2015) 'Economic growth and convergence in the Baltic States: caught in a middle income trap?', Department of Finance and Economics, Tallinn University of Technology, Tallinn, July 2015.

2.2. HOUSING PRICES

Graph 2.2.1: Deflated house prices



Source: European Commission - Eurostat

House prices have grown at the fastest pace in the EU in recent years, which raises the question whether Estonia is entering another housing boom-bust cycle as seen in 2007. Nominal price growth accelerated in 2014 to about 14 %, although it recently slowed down to 4 % year-on-year in the third quarter of 2015. In cumulative terms, house prices rose by 46 % from 2010 to 2014, compared to 29 % in Latvia and 15 % in Lithuania. However, to some extent, this reflects a rebound effect after they possibly fell too far. The cumulative increase in deflated⁽¹⁷⁾ prices over the past 10 years has been only about 10 %, in line with Estonia's regional peers (see Graph 2.2.1). Still, Estonia stands out as regards the strength of recent price hikes. The next section analyses the structural features of the Estonian housing market, namely demand, price and supply factors, and risks to macroeconomic and financial stability.

Features of the Estonian housing market

Home ownership bias

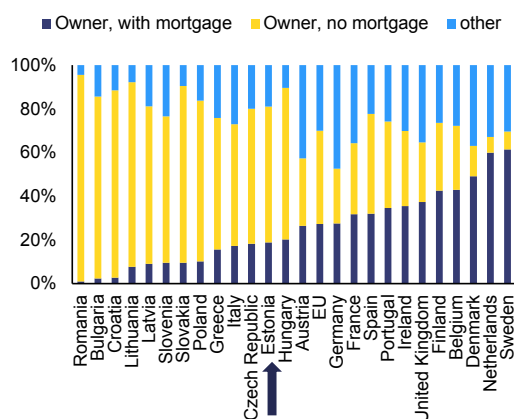
Estonian households have a relatively high share of home ownership. About 80 % of households own their home (see Graph 2.2.2). The high ownership rates in Estonia (and in other Central and Eastern European countries) also

⁽¹⁷⁾ Deflated by HICP, which essentially shows the extent to which house price growth has exceeded overall inflation.

reflect the low-cost transfer of the soviet-era housing stock to inhabitants in the 1990s.

The share of households who own their housing with a mortgage is relatively high in Estonia compared with its transition peer countries (see Graph 2.2.2). About 19 % of Estonian households own their home with a mortgage loan, which is a relatively high percentage in the region, where the mortgage market has only existed since the transition from the planned to open economies. However, compared with the EU as a whole, the transition countries still have a relatively low number of households with mortgage debt.

Graph 2.2.2: Home ownership with or without a mortgage (% of households)

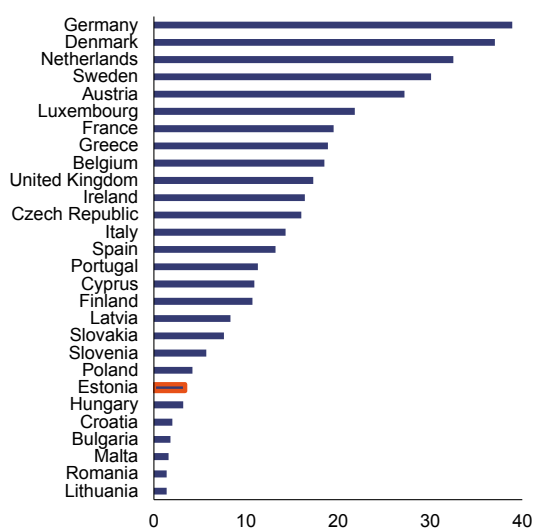


Source: European Commission - Eurostat - SILC, 2013

The rental market's share is small. The number of households renting represents only about 3 % of the total market, compared to 19 % in the EU on average (see Graph 2.2.3)⁽¹⁸⁾.

⁽¹⁸⁾ The share of tenants varies, according to the data source and definition of tenant used. Tenants (all types of rental contracts) account for about one fifth of the housing market according to population census data. Rentals at 'market price' account for about 3 %.

Graph 2.2.3: Share of households renting at 'market price'



Source: European Commission - Eurostat - SILC

The rental market is private and market-based with flexible rents and terms, without significant rent controls. Rental transaction costs are low, which facilitates the mobility of people. At the same time, the long-term rental market, as an alternative to ownership, remains underdeveloped with insufficient security of tenure. This is due to the fact that the rental market mostly operates in the informal economy, with poor income tax compliance on the part of landlords and weak rental contract formalisation and enforcement, and lengthy dispute settlement procedures⁽¹⁹⁾.

Debt bias

Overall, Estonia belongs to the group of EU countries where tax incentives for home ownership are high (see Table 2.2.1). Looking at the previous housing cycle (2000-2008) in the EU, high demand incentives tended to be associated with bigger changes in household indebtedness and house price misalignments⁽²⁰⁾.

⁽¹⁹⁾ European Commission, Rental Market Regulation in the European Union, Economic Papers No 515, *European Economy*, 2014.

⁽²⁰⁾ Quarterly report on the euro area, Volume 13, No 2, 2014.

Table 2.2.1: Composite index of tax incentives for owner-occupied housing

2011	Composite Tax Index	Incentives	2013	Composite Tax Index	Incentives
France	0	None	France	0	None
United Kingdom	0.4	Low	Greece	0	None
Cyprus	0.6	Low	Spain	0	None
Poland	0.6	Low	Cyprus	0.2	Low
Romania	0.6	Low	United Kingdom	0.2	Low
Belgium	0.8	Medium	Ireland	0.4	Low
Greece	0.8	Medium	Latvia	0.4	Low
Italy	0.8	Medium	Poland	0.6	Low
Latvia	0.8	Medium	Portugal	0.6	Low
Spain	0.8	Medium	Romania	0.6	Low
Austria	1	Medium	Belgium	0.8	Medium
Germany	1	Medium	Italy	0.8	Medium
Portugal	1	Medium	Slovenia	0.8	Medium
Hungary	1.2	Medium	Austria	1	Medium
Ireland	1.2	Medium	Germany	1	Medium
Luxembourg	1.2	Medium	Lithuania	1	Medium
Slovenia	1.2	Medium	Denmark	1.2	Medium
Lithuania	1.4	High	Hungary	1.2	Medium
Malta	1.4	High	Luxembourg	1.2	Medium
Slovakia	1.4	High	Czech Republic	1.4	High
Denmark	1.6	High	Finland	1.4	High
Netherlands	1.6	High	Malta	1.4	High
Bulgaria	1.8	High	Slovakia	1.4	High
Estonia	1.8	High	Bulgaria	1.8	High
Finland	1.8	High	Estonia	1.8	High
Czech Republic	2	High	Netherlands	2	High
Sweden	2	High	Sweden	2	High

Source: European Commission Calculations

There are several fiscal incentives for home ownership in place which also favour debt financing. Real-estate activity is encouraged by: tax deductibility of mortgage interest payments, non-taxation of capital gains from selling certain residential property (homes and summer houses), low recurring property taxes based on outdated cadastral land values. While mortgage interest rate deductibility will decrease with a reduction in the annual ceiling on overall income tax deductibility from EUR 1 920 to EUR 1 200, it still incentivises debt financing.

The level of property taxes is among the lowest in the EU. In 2014, property taxes stood at 0.3 % of GDP, which is the second lowest in the EU. The low level of recurrent property taxes and the availability of mortgage interest deductibility favours owner-occupied housing compared to other private investments. The effect of taxation on owner-occupation can be estimated on the basis of the user cost of capital⁽²¹⁾. The tax-adjusted user costs for owner-occupied housing in Estonia are among the lowest in the EU.

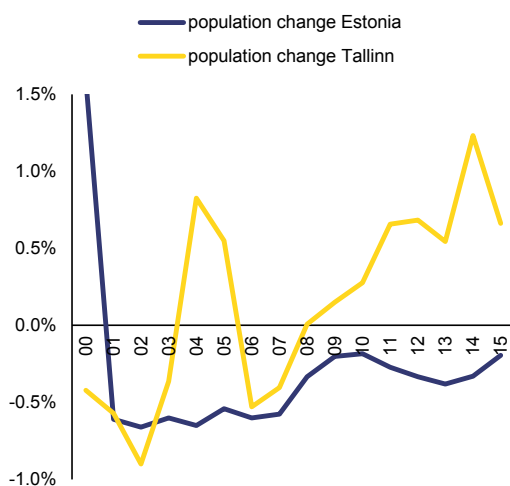
Home ownership is also supported for specific population groups (young families and young specialists) through a mortgage guarantee

⁽²¹⁾ This measures the annual cost of owning and operating the main residence per additional euro of house value. Source: Tax Reform Report 2015, European Commission. .

system run by the Credit and Export Guarantee Fund (KredEx). About one tenth of all mortgages have a KredEx guarantee, which helps younger population groups who have not yet accumulated sufficient savings for a down-payment to qualify for a mortgage.

Apart from taxes, real-estate transaction costs and the related administrative and legal burden is assessed to be one of the lowest and least expensive in the EU ⁽²²⁾. The low transaction costs and limited red tape in housing transactions also encourage a very dynamic market. At the same time, the ease of buying and selling property may lead to higher volatility and have an overall upward effect on house prices. Combined with low taxation, it enables households to increase the maximum mortgage amount that they can afford. This would increase the prevailing price level in the market and allow more new housing supply (assuming housing supply is not constrained).

Graph 2.2.4: Population trends in Estonia and Tallinn



Source: Statistics Estonia

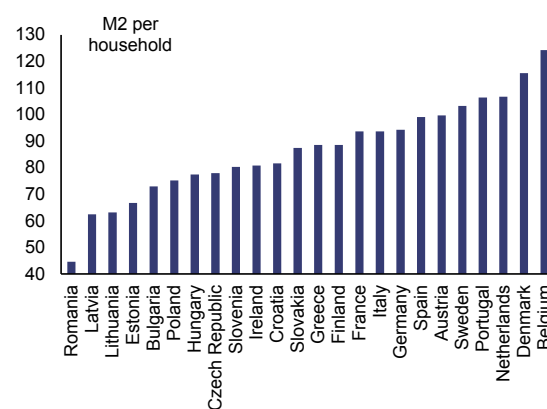
Factors of demand

Tallinn is experiencing longer-term demand pressures, given the favourable population and socioeconomic trends in the capital. Half of all transactions in the Estonian housing market take place in Tallinn. It is the economic centre of the

⁽²²⁾ Lamine, Baudouin (2010) Estonia: analysis of a housing boom, European Commission, Country Focus, volume VII, issue 6.

country and home to about a third of the population and has expanded steadily in recent years (see Graph 2.2.4). Moreover, while overall demographic trends in the country have been negative, the number of one-person households has increased, supporting the demand for housing even in a situation of overall decline in population.

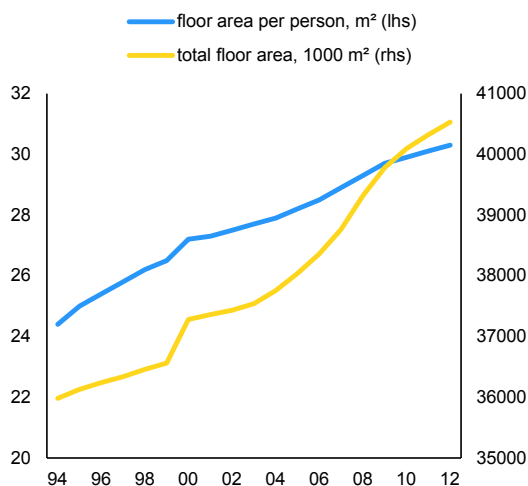
Graph 2.2.5: Housing: m² per household in EU



Source: European Commission - Eurostat, 2012

The average size of dwelling per household member is still significantly lower in Estonia than the EU average, but it has steadily increased over the past decade (See Graphs 2.2.5 and 2.2.6). The housing stock in Tallinn is still characterised by the predominance of soviet-era apartment blocks. It can be expected that as household income rises, the trend of the population moving into higher quality and more spacious housing will continue.

Graph 2.2.6: Housing size trends in Estonia

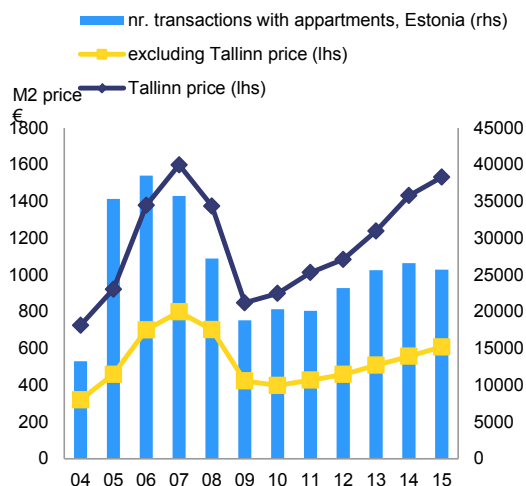


Source: Statistics Estonia

In recent years, house prices have been driven by price rises in Tallinn and sales of new apartments, reflecting higher demand. In Tallinn, the average square metre price of an apartment is already approaching the 2007 boom levels (see Graph 2.2.7). The second largest city, Tartu, also contributes to price growth, but in all other regions of Estonia price increases have been substantially more moderate or even stagnant. Also, prices of apartments have grown more rapidly than those of detached houses or land ⁽²³⁾. As discussed above, the general long-term demand pressures in Tallinn can be explained by the rise in the number of households, ongoing urbanisation, the amortisation of old soviet-era apartment buildings and a move towards quality housing in line with rising incomes. Housing demand and prices are additionally boosted during periods of economic and credit growth and consumer optimism, which was particularly high during the 2007 boom, but these factors have played a lesser role in recent years. The Estonian housing market is still dominated by local buyers, as the share of non-resident investors is only 2-3 %, according to Estonian Land Board data.

⁽²³⁾ See real-estate companies' market overviews, for example Pidi, Ober Haus, Arco Vara, Adaur.

Graph 2.2.7: Average apartment square metre price trends in Tallinn and in the rest of Estonia and number of transactions



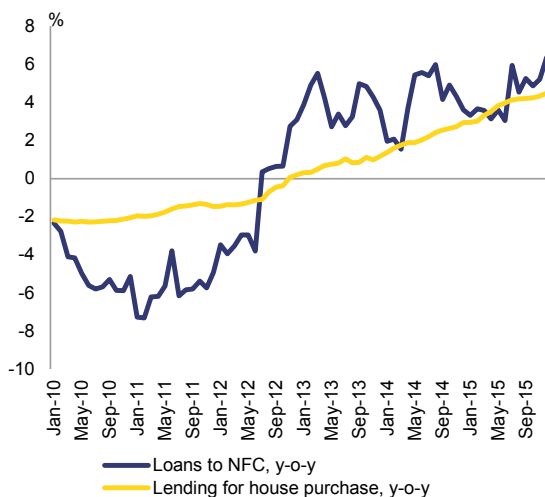
Source: Estonian Land Board - Registry

Lending growth has remained moderate, even in an environment of low interest rates. The banking sector has returned to slight growth since 2012. New housing loans grew 4.5% year-on-year in 2015, having gradually gathered pace since 2013. Lending to corporations has similarly remained restrained (Graph 2.2.8). Household deleveraging has currently slowed after a substantial adjustment following the bust of the 2007 real-estate bubble (Graph 2.2.9). Therefore, the increase in house prices cannot be currently assigned to aggressive bank lending or excessive household debt.

In contrast to the 2007 boom years, mortgages play a smaller role in financing purchases. Mortgage financing has grown less in recent years than the aggregate sum of real-estate transactions ⁽²⁴⁾. This indicates a higher number of cash-only purchases and/or higher down-payments on loans. It suggests that compared to the 2007 boom years, a larger share of home purchases is financed by household savings. This trend is in line with the growing stock of household deposits and the currently low yield on financial savings, which also favours real-estate investment.

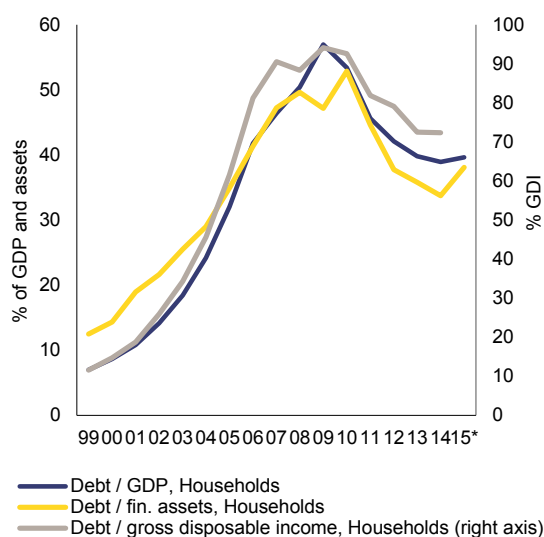
⁽²⁴⁾ Bank of Estonia, Financial Stability Overview, 2015/2.

Graph 2.2.8: Main trends in lending



Source: European Central Bank

Graph 2.2.9: Households' leverage



Source: Eurostat

Housing valuation estimates

Price-to-income (affordability) and price-to-rent (investment yield) trends appear more stable than nominal price growth and are moving back to long-term averages. While nominal house price levels in some segments and geographical areas have come close to their 2007 boom values, nominal GDP and incomes are already well above the level of 2007. Housing affordability, calculated as the price-to-income ratio, improved dramatically after the steep fall in house prices in 2009, but has returned to its long-term values since then (see Graph 2.2.10).

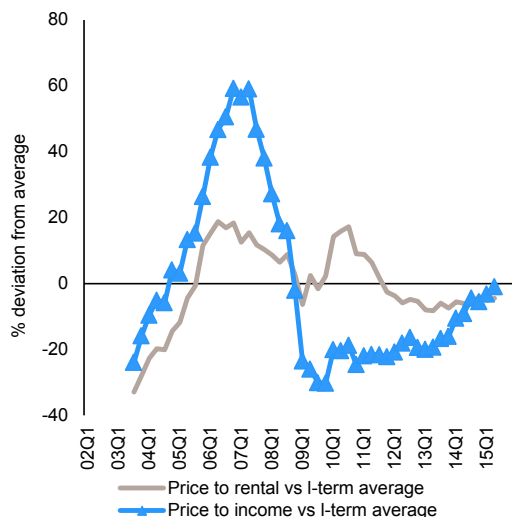
According to different valuation gap models, house prices have increased in recent years close to a notional ‘overvaluation’ estimate, but have not yet significantly passed it. In the EU context, Estonia belongs to the group of countries that are recovering fast from the previous real-estate bust phase, but the valuation gap has not yet grown out of line with fundamentals⁽²⁵⁾⁽²⁶⁾ (see Graph 2.2.11). Alternatively, the results from a different methodology for estimating an overvaluation gap are presented in Graph 2.2.12⁽²⁷⁾. It indicates that prices reached a notional ‘overvaluation’ threshold in 2014. Should the present price increase persist, however, house prices would soon be overvalued. Also, a potential economic shock could weaken the fundamentals (for example real incomes) and thereby change the estimated valuation gap.

⁽²⁵⁾ For further details, see European Commission: ‘Housing market adjustment in the European Union,’ Box 1.3, in European Economic Forecast — Spring 2014, *European Economy*, 2014.

⁽²⁶⁾ See also, European Commission, DG ECFIN, *EU Monitor of Macroeconomic Imbalances*, 2015.

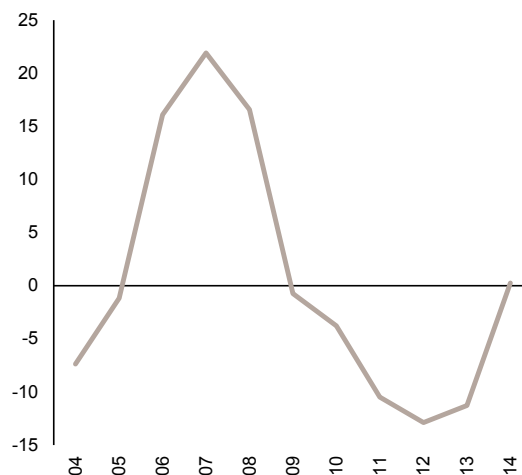
⁽²⁷⁾ This is estimated using an econometric model, based on five fundamental variables: relative house price, total population, real housing investment, real disposable income per capita and real long-term interest rates.

Graph 2.2.10: Price-to-rent and price-to-income trends



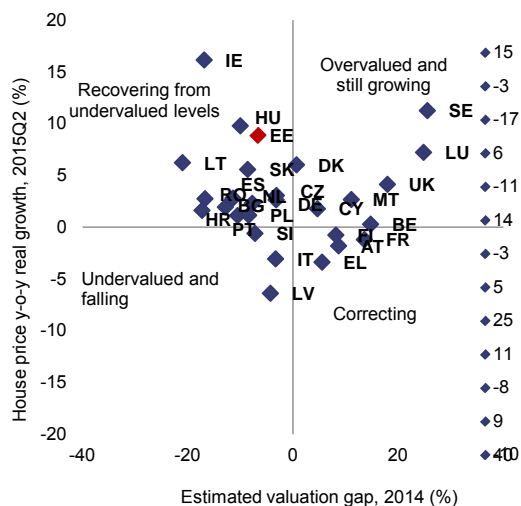
Source: European Commission

Graph 2.2.12: Valuation gap for main supply and demand fundamentals



Source: European Commission - Calculations from Staff

Graph 2.2.11: Valuation gaps and house price growth

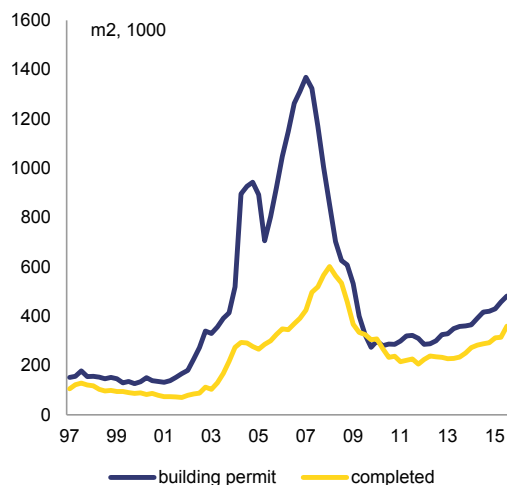


Source: European Commission calculations

Drivers of supply

The supply of new housing has increased in response to higher demand and higher prices. The volume of building permits and completed housing has been on the rise in recent years, although it is still far from the exceptional values of the 2007 boom years (see Graph 2.2.13). In Tallinn, which has the most active construction market, building permits (per square metre) increased by almost 80 % year-on-year in the first three quarters of 2015, and construction start-ups by about 20 %. Compared with other EU peer countries, Estonia has currently one of the highest residential investment rates, at about 3 % of GDP (see Graph 2.2.14).

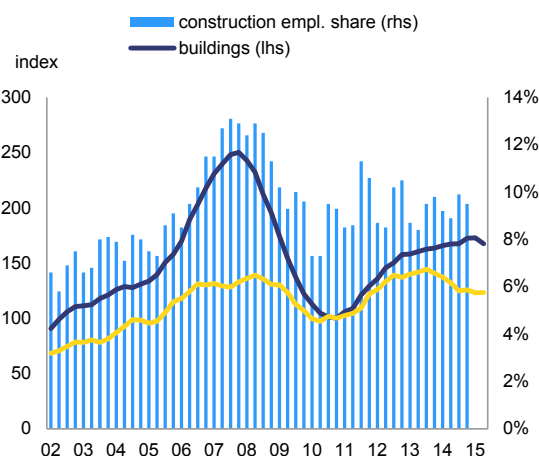
Graph 2.2.13: Building permits and completions



Source: Statistics Estonia

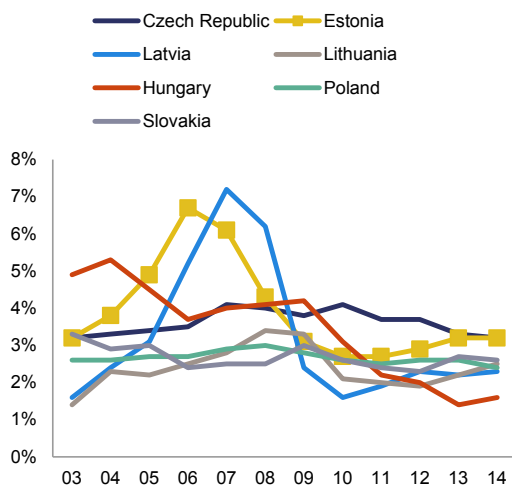
benchmark for Estonia. The construction sector was still markedly underdeveloped in the economic transition years in 1990s and early 2000s, when residential construction was well below its long-term historical average ⁽²⁸⁾.

Graph 2.2.15: Construction output volume (lhs) and share of construction sector employment (rhs)



Source: Statistics Estonia

Graph 2.2.14: Residential construction as % of GDP



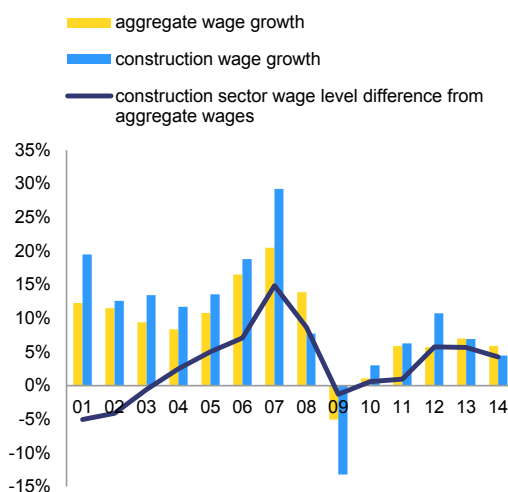
Source: Eurostat

In contrast to the period leading up to the 2007 boom, recent wage trends in the construction sector have been broadly in line with other economic sectors (see Graph 2.2.16). This is a relatively benign development as construction workers' wages in Estonia are strongly influenced by wage competition from the Finnish construction market. While during the 2007 boom years construction sector wages exceeded the national average by 15 %, this fell to about 5 % in 2014.

⁽²⁸⁾ Lamine, Baudouin, Estonia: analysis of a housing boom, European Commission, Country Focus, volume VI, issue 07, July 2009.

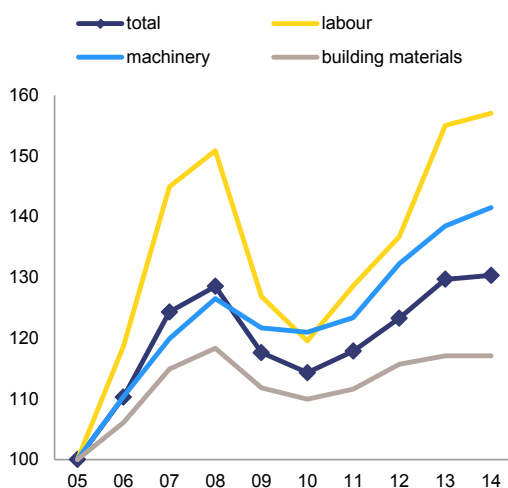
The construction sector does not show signs of overheating. It has recovered from its post-crisis trough but still has spare capacity due to the relatively weak volume of infrastructure construction and declining corporate investment. While the sector is presently more buoyant than before the 2007 boom years (see Graph 2.2.15), this period does not provide the best long-term

Graph 2.2.16: Aggregate wage growth and construction sector wage growth



Source: Statistics Estonia

Graph 2.2.17: Construction price index components



Source: Statistics Estonia - Residential buildings

Overall, construction costs have increased by roughly 14 % since 2010 and around 30 % since 2005. This is slightly lower than the consumer price inflation (HICP). The construction price index has been largely driven by labour costs, while the cost of building materials has been more stable in relative terms (see Graph 2.2.17).

However, the rise in construction costs explains only a small part of the recent rise in real-estate prices. Considering that nominal house prices have grown by 46 % since 2010, the real-estate development sector as a whole (which is broader than the construction sector alone) appears to have managed to increase its margins significantly and has strongly recovered since the real-estate bubble burst in 2009. ⁽²⁹⁾

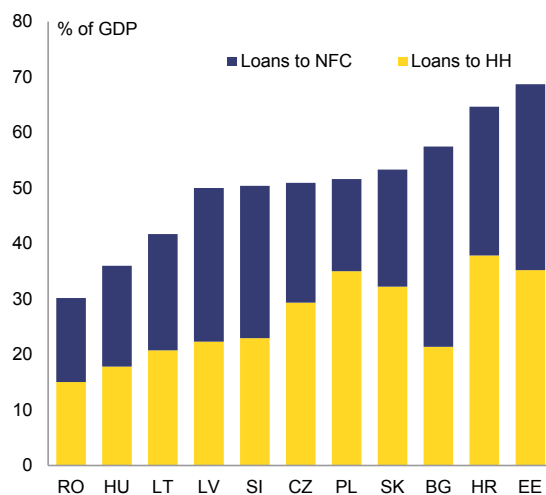
Estonia does not have significant housing supply constraints to an extent that would create long-term price pressures. Overall, the regulatory environment governing housing planning and construction is not considered to be an obstacle that leads to housing shortages. Moreover, considering the low population density in Estonia and even in the capital city, land availability is not a constraint. The responsiveness of housing supply to current demand should attenuate price pressures. Technically, however, the increase in new expensive housing is leading to a further rise in transaction values. In the short term, the supply of new housing could be partly limited by lengthy infrastructure development and planning processes. However, real-estate developers typically have a large reserve of projects at various planning stages ⁽³⁰⁾, limiting the time needed to bring new supply to the market.

As the 2007 boom years showed, in an environment of strong demand pressures, both prices and supply of new housing can increase dramatically. In 2007, the housing and credit boom also led to an overheating of the construction sector and fuelled the current-account deficit. Presently, with the current account in surplus and no capacity overloads in the construction sector, the extent of spillovers to the other sectors of the economy are much more limited.

⁽²⁹⁾ Residential land prices have been relatively stable over the same period and do not explain the rise in prices (Source: Estonian Land Board statistics, and Pindi.ee Market Overviews).

⁽³⁰⁾ Source: Pindi.ee, Market Analyses.

Graph 2.2.18: Lending to private sector as % of GDP



Source: European Central Bank - European Commission (AMECO)

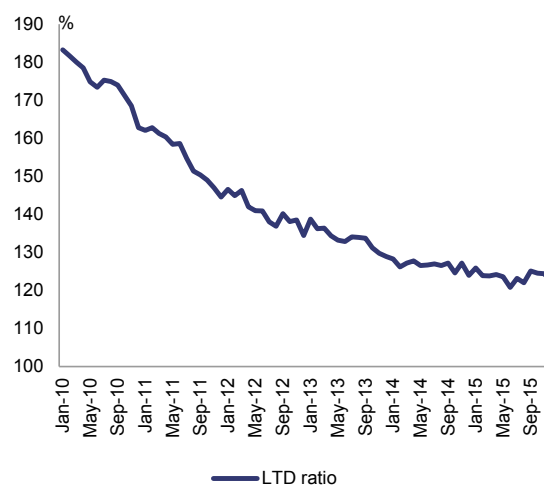
Financial sector

Spillover risks from the housing market to the stability of the financial sector appear limited.

The banking sector in Estonia is growing in line with the economy. Lending to households and corporations generally satisfies the present credit demand. It is largely funded by local deposits and, since recently, increasing foreign liabilities. Mortgage borrowing is expected to grow moderately as banks remain cautious. The stability of the financial sector does not appear to be threatened as the banking sector is well capitalised, liquid and profitable.

Total stock of loans to the private sector was the highest among EU peers in Central and Eastern Europe. In 2015, it stood at 69 % of GDP (Graph 2.2.18), indicating Estonians' relatively high propensity to borrow. Banks are the dominating financial intermediaries in Estonia. Their assets stood at EUR 21.5 billion in 2014, which represented 111 % of GDP

Graph 2.2.19: Main trends in the balance sheet of the banking sector funding (ratio of loans to deposits)



(1) Excluding claims on MFI, government and non-residents
Source: European Central Bank

The present mortgage portfolio reflects conservative lending standards. Practically all (99.8 %) mortgage loans are amortised and the average maturity is 24 years. The share of foreign currency loans is negligible (0.05 %). Almost all loans (99 %) have a variable interest rate and the current average rate is 2.3 %. For newly granted loans, the average loan-to-value ratio is 68 % and the debt-service-to-income ratio is below 20 %⁽³¹⁾. Borrowers often provide double collateral (two properties for one loan) to lower the loan-to-value ratio⁽³²⁾. However, this exposes the households concerned to higher risks if they are unable to service their loan.

Financial soundness indicators suggest that the banking sector is stable. Banks are well capitalised, with the average solvency ratio at 34.2 % in the second quarter of 2015, the highest in the EU. Their capital is almost exclusively core Tier 1 capital (Table 2.2.2). The quality of bank assets remains good. The average ratio of non-performing loans decreased from 2.6 % in 2014 to 2.4 % in the second quarter of 2015. Loan-loss provisions covered 45 % of outstanding non-performing loans, which was below the euro area

⁽³¹⁾ Data from presentation by the Estonian Financial Supervisory Authority, November 2015.

⁽³²⁾ In one large bank, the average LTV is currently around 50 %.

average (50 %). Since 2011, the sector has been making high profits. In 2014, both return on equity (9.7 %) and return on assets (1.6 %) were far above the euro area average (3.6 % and 0.2 %, respectively). The decline in both rates of return by mid-2015 (Table 2.2.2) was temporary, related to dividends paid out by some large banks (which also affected the capital adequacy ratio) and, in part, the negative impact of the low-interest-rate environment.

The funding structure of the banking sector rebalanced towards domestic savings. The loan-to-deposit ratio (resident deposits only) stabilised at around 125 %, a more sustainable level compared to the situation before the crisis, when it exceeded 200 % (Graph 2.1.19). So far, the financial sector has not felt funding constraints, but local deposits may prove insufficient to cover credit expansion going forward. Non-resident deposits, which account for about 18 % of total deposits in the banking system⁽³³⁾, recorded moderate growth and created no particular concern.

Table 2.2.2: Financial soundness indicators

	2010	2011	2012	2013	2014	Q2 2015
NPLs, %	9.3	4.5	3.0	1.9	2.6	2.4
CAR, %	16.3	19.4	23.2	23.1	41.8	34.2
Tier 1 ratio, %	12.7	18.5	22.8	22.7	41.3	33.8
RoE, %	3.6	22.9	11.7	10.7	9.7	2.1
RoA, %	0.4	3.1	2.0	1.8	1.6	0.4
Coverage ratio	85.0	53.4	75.0	75.3	43.9	44.8

(1) All domestic and foreign banks (subsidiaries and branches)

Source: European Central Bank

Consolidated micro-prudential supervision is carried out by the Estonian Financial Supervision Authority (FSA). Under the single supervisory mechanism, a joint supervisory team, led by the ECB and consisting of both ECB and local supervisors, directly supervises two large banks: Swedbank and SEB. Other banks continue to be supervised by the Financial Supervision Authority in close cooperation with the ECB. The supervisory authorities of the parent banks directly supervise their foreign bank branches in Estonia, the largest being Nordea and Danske Bank branches.

Macro-prudential measures controlling credit demand have been tightened recently. They are

aimed at preserving the current conservative lending standards. Eesti Pank is responsible for macro-prudential supervision. Since January 2015, it requires banks to stress-test new borrowers with an interest rate increase to 6 %⁽³⁴⁾, which is crucial considering that almost all loans have variable interest rates. In March 2015, it replaced guidelines on granting housing loans by regulatory requirements that set the limits for the loan-to-value ratio at 85 %, the debt-service-to-income ratio at 50 % and maturity at 30 years. Irrespective of these requirements, banks have recently applied strict credit standards on their own. In contrast to the pre-crisis boom practices, they require not only good collateral but also sufficient cash flows to grant loans. Both the bank's macro-prudential policy and the relevant lending standards contribute to preserving financial stability. Nevertheless, trends in the mortgage market warrant close monitoring.

Eesti Pank introduced a counter-cyclical capital buffer requirement. Starting from 1 January 2016, the buffer was set at zero, with a view to increasing it if and when deemed necessary. The higher capital requirements set during times of rapid growth can help to slow the growth in credit and restrain rises in asset prices. Since credit growth is currently in line with GDP growth, the bank has set the capital buffer rate at 0 %. It will assess changes in the credit cycle every quarter to determine whether to change the capital buffer rate.

Specific external risks stem from the dominant position of Scandinavian financial groups in Estonia. Potential financial stress in the Nordic banking system, e.g. caused by tensions in global funding markets or a correction in housing prices, could have an indirect adverse impact on operations in Estonia. Consequently, this might result in tighter credit supply conditions on the local market. For a more detailed analysis of potential financial spillovers in the Baltic-Nordic region see the 2016 Country Report for Sweden.

Outlook for the real-estate market developments

Spillover risks from the real-estate sector to economic and financial sector stability appear

⁽³³⁾ Bank of Estonia, Financial Stability Review, 2015/2.

⁽³⁴⁾ Or by 2 percentage points, whichever is higher.

low. The recent rapid rise in house prices is not driven by excessive lending, unlike the 2007 boom years. While housing supply has increased in response to the price rises, the construction sector does not appear to have overheated.

In the medium and long term, high demand for housing will likely persist due to the increasing number of households in the largest cities and the move towards higher quality and larger housing as income convergence with the EU is also advancing. However, these fundamental demand pressures are relatively modest, considering the overall population decline in the country.

Latest data shows that prices in the real-estate market have stabilised in recent quarters, which might indicate a moderation in price trends going forward. The previously rapid price increases partly reflected a rebound effect from undervalued prices after the market bubble burst in 2009. In addition, the supply of new housing has increased.

Compared to the boom years before 2008, lending policies have become more cautious and banks have introduced more restrictive macro-prudential measures. Macro-prudential regulations set by Eesti Pank have been tightened recently, but in practice banks already complied with the new limits for the most part. Therefore, no immediate impact on lending trends can be expected and moderate mortgage lending growth is likely to continue. However, if credit demand is deemed to gather pace excessively, the central bank has leeway to further tighten the macro-prudential measures.

2.3. MIP ASSESSMENT MATRIX

This MIP assessment matrix summarises the main findings of the in-depth review in the country report. It focuses on imbalances and adjustment issues relevant for the MIP.

Table 2.3.1: MIP assessment matrix(*) - Estonia

	Gravity of the challenge	Evolution and prospects	Policy response
Imbalances (unsustainable trends, vulnerabilities and associated risks)			
Competitiveness	<p>Unit labour costs (ULC) in Estonia have increased rapidly in recent years, because of both strong wage growth and low productivity growth (p 13) (see Graph 2.1.1).</p> <p>High wage growth can be explained by several factors which do not necessarily undermine competitiveness (pp. 13-18).</p> <p>Likewise, external developments do not raise concerns, except possibly for goods. The lower goods exports largely reflect anaemic foreign demand from Russia and Finland (pp. 21-23).</p> <p>The lower goods exports also reflect an overall decline in quality rank or export structure of Estonia's manufactured products. Here, low productivity growth, and in particular the lack of investment in RDI, is a source of concern (pp. 18-20).</p> <p>The low productivity growth and very slow adaptation to competing in high-value added sectors represent a risk if wage growth continues at its current pace.</p>	<p>While the rise in ULC may pose a risk to cost competitiveness, there are a number of mitigating factors that include a partial recovery after the sharp contraction in 2009, a similar ULC position to Baltic peers, no obvious malfunctioning in the labour market and an increase in household income that is stimulating consumption growth (see Graphs 2.1.9 and 2.1.11). The gap between real wages and productivity is forecast to close in 2016-2017 due both to increases in productivity and to decreases in the real wage.</p> <p>In 2014, the overall level of R&D investment in Estonia as a percentage of GDP (1.46 %) fell further below the EU-28 average of 2 %. The export structure or quality rank of the Estonian manufactured products has also been on a downward trend in recent years (pp. 20-21 and pp. 49-50).</p>	<p>Overall, policies have aimed to strengthen the labour supply. Such policies are expected to be continued, given the rapidly contracting population of working age (pp. 16-17 and pp. 40-48 - Graph 2.1.7).</p> <p>A number of policies were introduced to foster productivity growth, including lifelong learning, vocational education and tertiary education reform. However, given the size of the productivity challenge, the policy response appears insufficient, in particular on investment in RDI and intellectual property products (pp. 18-20 and pp. 49-52).</p> <p>Also, public support is being given to smart specialisation areas. Estonia has made progress in early stage financing for enterprises, but investment in intellectual property products and RDI remains low, even declining for the latter (pp. 49-52). Resource/energy efficiency is being improved, although at a slow pace (pp. 53-55).</p>
House prices	<p>Although increasing fast, current house price levels are still in line with fundamentals, notably incomes, which have also risen rapidly (pp. 29-30).</p> <p>The upward trend in house prices also reflects a rebound since the credit bubble burst in 2009. While demand for housing has revived since the crisis, credit growth is not excessive at around 5-6 % in recent months (pp. 27-29). Also, the construction sector does not currently appear to have overheated (pp. 31).</p>	<p>House prices increased rapidly, by 12.9 %, in 2014 and are expected to continue to rise, although in single digits in 2015 and 2016 (pp. 25). The latest data indicate that house price increases have slowed down (4 % y-o-y in 2015Q3). The housing supply is slowly adjusting, judging from the surge in building permits in recent quarters, and this is expected to ease the increased demand pressure (pp. 30-32).</p>	<p>Important policies have been adopted. The deductibility of mortgage interest payments has been reduced recently by the government. Abolishing it altogether is a further policy option. Property taxation is currently under-utilised (pp. 26-27).</p> <p>Estonia has strengthened its overall macro-prudential framework, an important step towards maintaining financial sector stability. Overall, the risks to financial sector stability appear limited currently, and are much lower than at the time of the 2008 housing bubble (pp. 33-34).</p>

(Continued on the next page)

Table (continued)

Conclusions from IDR analysis
<ul style="list-style-type: none"> • Estonia is characterised by two possible signs of domestic overheating: the rapidly rising unit labour costs and housing prices. Both pose risks, as they expose the country to possible competitive losses and a disorderly correction with harmful implications for the real economy. • The gap between real wages and productivity is forecast to close in 2016-2017, due both to increases in productivity and to decreases in the real wage. On housing, demand pressures are expected to ease as the supply of housing is expected to rise with new permits granted. • Policy efforts to promote investment in science education, telecommunications, and technological development appear currently insufficient to strengthen productivity growth, foster higher value added exports of goods and raise potential output. Efforts to boost the labour supply and release wage pressures are at an early stage and their impact needs to be monitored. Numerous macro-prudential policies have been introduced to limit financial stability risks. It will be necessary to monitor their effects, particularly on movements in house prices.

(*) The first column summarises 'gravity' issues which aim at providing an order of magnitude of the level of imbalances. The second column reports findings concerning the 'evolution and prospects' of imbalances. The third column reports recent and planned relevant measures. Findings are reported for each source of imbalance and adjustment issue. The final three paragraphs of the matrix summarise the overall challenges, in terms of their gravity, developments and prospects, policy response.

Source: European Commission

3. ADDITIONAL STRUCTURAL ISSUES

In addition to the imbalances and adjustment issues addressed in section 2, this section provides an analysis of other structural economic and social challenges for Estonia. Focusing on the policy areas covered in the 2015 country-specific recommendations, this section analyses issues related to taxation and fiscal frameworks, labour market and social policies, technological development, energy efficiency and infrastructure, and public administration.

3.1. FISCAL FRAMEWORK AND TAXATION FRAMEWORK

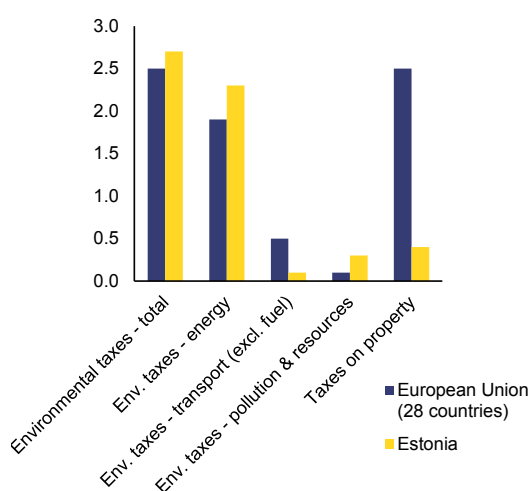
Taxation framework

Overall, the Estonian tax system is growth-friendly. In 2014, the Estonian tax burden, at 32.2 % of GDP, was well below the 38.8 % average for the EU countries. In 2014, 41.3 % of revenue was collected from consumption taxes, which is considerably higher than the EU average of 28.3 %. At the same time, labour tax revenue amounted to 16.3 % of GDP and is below the EU average (19.6 %). The implicit tax rate on labour (34.6 %) was below the EU average (36.4 %).

Estonia continues to pursue a tax shift away from labour. As detailed in section 3.2 (under ‘Tax wedge’), Estonia’s Parliament adopted a series of significant labour taxation cuts in 2015 and additional measures have already been decided to cover the years to 2019. Estonia under-utilises some categories of taxes that are considered least detrimental to growth, such as recurrent property taxes (see section 2) and environmental/transport taxes (see section 3.4) (Graph 3.1.1), which could be also utilised for a further tax shift or for environmental objectives.

Tax collection is efficient, overall. The World Bank estimates that in 2014 it took on average 81 hours per year for Estonian businesses to comply with the tax regulation. That compares favourably with the EU average of 185.6 hours and puts Estonia on second place just behind Luxembourg. The tax administration system functions efficiently with administrative costs for 2013 estimated at 0.4 % of net revenue collected, which is the lowest in the EU.

Graph 3.1.1: Selected taxes by function, in % of GDP



Source: European Commission, 2014

Recent measures to increase tax compliance have been successful. In 2014 the value added tax (VAT) rules were changed in order to broaden the VAT base and to address the VAT gap, which had increased from 10 % in 2010 to 16.8 % in 2013, exceeding the EU average of 14.5 %. Specifically, the rules for VAT deductions on vehicles used for both business and private purposes were changed, limiting the maximum deduction to 50 % of the VAT paid. A notable change was made to the VAT reporting obligation. Since November 2014 all VAT taxable persons have had to report monthly on business-to-business transactions for all vendors with whom the sum of transactions exceeds EUR 1 000. This data allows cross-matching of different vendors to detect VAT fraud. The Estonian Tax and Customs Board considers this measure to be highly successful, resulting in a very sharp VAT increase in 2015. To address the issue of undeclared labour, an employment registry was introduced, to which all employment relations have to be reported. The Estonian Tax and Customs Board reported that 21 000 additional

(previously officially not employed) workers were reported in 2014, which is almost 4 % of the total workforce.

Fiscal framework

The State Budget Act that entered into force on 23 March 2014 has strengthened Estonia's fiscal framework. The cornerstone of Estonia's medium-term fiscal planning is the balanced budget rule in structural terms. At the same time, expenditure rules are under-utilised.

The State Budget Act has also established an independent Fiscal Council, which is now fully operational and has published opinions on the macroeconomic and fiscal forecast underlying the 2016 Draft Budget Plan. The mandate of the Fiscal Council is to assess the economic forecasts that serve as a base for Estonian fiscal policy and to observe whether the national fiscal rules are followed.

Local government revenue is not well balanced with responsibilities. Local authorities are small, fragmented and population density uneven across the country, which means that access to local services is not guaranteed in all municipalities and the provision of quality services at local level remains a challenge (see also section 3.5 on local government reform). Nevertheless, local government's aggregate fiscal performance is sound, because debt financing is restricted.

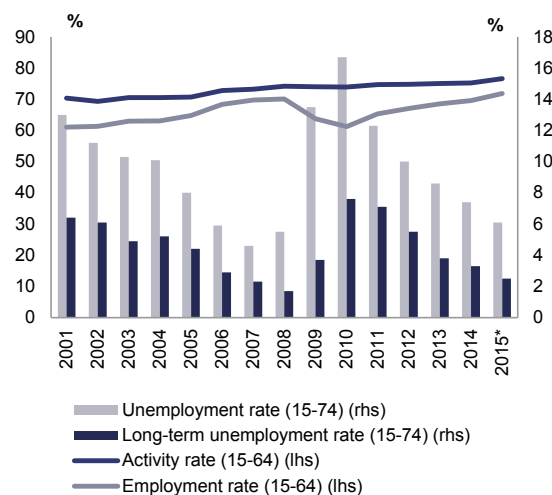
Overall, Estonia's public finances are sound with a very low public debt and a general government fiscal position in surplus. The long-term sustainability risks are also assessed to be low. The fiscal framework was strengthened in recent years, with the balanced budget rule in structural terms as the main cornerstone. However, a lack of more binding multi-annual expenditure rules limits the counter-cyclicality of the framework.

3.2. LABOUR MARKET, SOCIAL POLICIES AND EDUCATION

In spite of a shrinking working age population, employment increased in 2014, mostly driven by economic growth. Unemployment declined and activity rates remained broadly stable (Graph 3.2.1).

In 2014, the aggregate employment rate (15-64) stood at 69.6 %, up from 68.5 % in 2013, and above the EU average of 64.9 %. While it slightly increased for women, employment rate growth was more marked for men (from 76.7 % in 2013 to 78.3 % in 2014), and even more so for low-skilled men. A contributing factor was the extension of the requirement to register workers with the employment register beyond employees to freelancers and voluntary workers. 2015 saw a continuation of these trends: the employment rate increased from 69,6 % in 2014 to 71.9 % in the first three quarters of 2015 (15-64 age category). While employment in agriculture continued on its long-term declining trend, 2014 saw new jobs being created, notably in wholesale and retail, food and accommodation services. In spite of being the largest employment sectors in Estonia, employment in these sectors is still around 10 % below pre-crisis levels. Most of the new jobs created in 2014 were permanent jobs: part-time and temporary work has been declining since 2011, reflecting a more broadly improving labour market.

Graph 3.2.1: Activity (1), employment (1) and unemployment rates (2)



(1) Activity and employment rates (% of population), total (left axis)

(2) Unemployment rate and long-term unemployment rate (% of labour force), total (right axis)

(*) Average of first three quarters of 2015. Data for total unemployment rate is seasonally adjusted.

Source: European Commission - Eurostat - Labour Force Survey

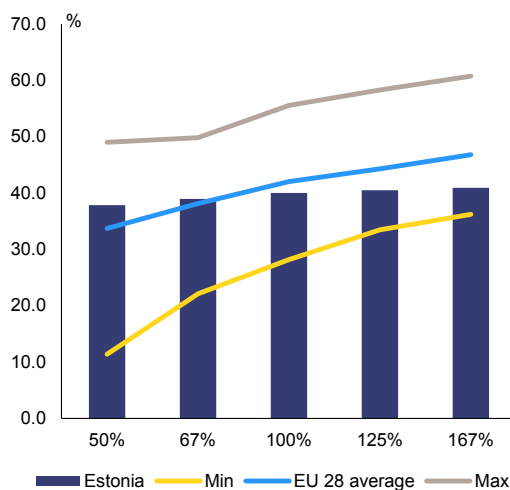
The unemployment rate has fallen considerably since the crisis, even if it is still slightly above pre-crisis levels. Trends in long-term unemployment have broadly followed those in aggregate unemployment. Long-term unemployment fell from 3.8 % in 2013 to 3.3 % in 2014, which is significantly below the EU average. In 2015, this decline continued to 2.5 % (average of 2015Q1-Q3). The Work Ability reform is expected to lead significant numbers of people currently receiving invalidity allowance to register as jobseekers from 2017 onwards, leading to an expected increase in the unemployment rate.

Tax wedge

While Estonia's tax burden on labour is largely aligned with the EU average (Graph 3.2.2), the tax wedge on low income earners remains relatively high. Looking at different levels of income, however, low-income earners face a relatively high tax wedge compared to the other EU countries, while high-income earners face a relatively low tax wedge compared to the other EU countries. This may have a negative impact on labour supply of and/or labour demand for low-

skilled workers, or discourage formal employment. Especially for workers who earn less than a full-time minimum wage (e.g. by working part-time), the tax burden is high because there is a minimum social tax payment for anyone who works. It is set at roughly the amount of social tax due on the (previous year's) minimum wage, which has a disincentive effect on part-time and temporary workers, especially at low wage levels.

Graph 3.2.2: Tax wedge of single earners in Estonia and the EU - Various income levels - 2014



Source: European Commission - Based on OECD Tax-benefits models

In line with the 2015 and 2016 Council Recommendations for the euro area and in particular the recommendation to Estonia, a series of tax measures have been adopted to reduce the tax burden on labour income and to contribute to an increase in labour supply. In 2015, Parliament reduced Estonia's flat rate of personal income tax from 21 % to 20 %; the monthly basic personal income tax allowance was increased from EUR 144 in 2014 to EUR 154; and the unemployment insurance contribution rate paid by employers and employees was reduced from 3.0 % to 2.4 %. In addition, a series of measures will be implemented between 2016 and 2019. The social tax (for health insurance) will be reduced from 33.0 % to 32.5 % in 2017 and further to 32.0 % in 2018. The basic personal income tax allowance was raised from EUR 154 per month in 2015 to EUR 170 in 2016, and gradually further to EUR 205 in 2019. If average wages grow according to current forecasts, these changes will

keep the ratio of the basic allowance to the average wage roughly at its current level.

Also, in order to motivate low-income earners to stay in the labour market or to accept job offers, Estonia introduced a mechanism to refund personal income tax paid on their salaries. As of 2016, low-income earners who work at least six months a year will see their take-home pay significantly increase as a result of a full personal income tax refund in the year they file their taxes. The tax refund applies to incomes around the minimum wage (up to EUR 480 per month). For higher incomes, the tax refund will be reduced linearly to reach zero for those earning at least EUR 649 per month. The government estimates that around 103 600 individuals will benefit from this tax refund: this is about 15 % of the labour force. One weakness that has been identified is that the abrupt decline in the tax refund with rising income gives rise to rather high effective marginal tax rates for incomes between EUR 480 and EUR 649 per month, which risks encouraging non-declaration of earnings or could limit labour supply.

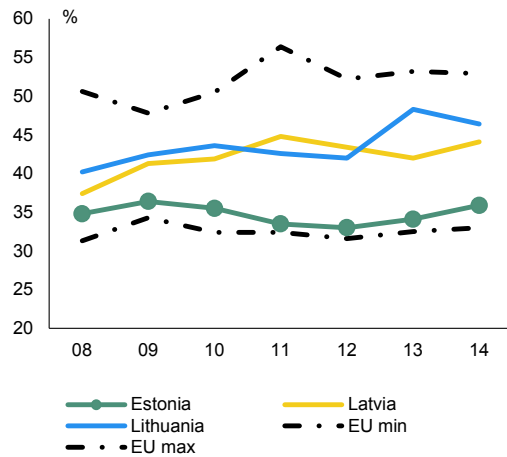
The above tax measures will reduce the tax wedge for all income groups, including for low-income earners. The changes to taxation will likely reduce the overall tax wedge of labour and the planned personal income tax refund mechanism will reduce the relatively high tax wedge for low-income earners, depending on how actively taxpayers request refunds of income tax paid. However, overall, the measures appear to act only on a very narrow range of incomes and their positive impact is expected to fade out relatively soon in a context of still relatively rapid wage increases. Although Estonia performs better on the labour market for low-income earners than its Baltic peers, it would benefit still from further progress in this area.

Minimum wages

The minimum wage has been raised several times in recent years and further increases are planned. After a period of relative stagnation (2009-2012), the minimum wage benefited from annual rate increases of about 10 % — from EUR 290 per month in early 2013 to EUR 390 in 2015. In October 2015, social partners agreed on a further increase to EUR 430 in 2016 and EUR 470

in 2017. These developments should be seen against a background of the relatively low starting levels of the minimum wage and of relatively low coverage of employees in 2013. Also, despite the significant increases in recent years, the Estonian minimum wage is still one of the lowest in the EU when expressed as a percentage of the average wage. At the same time, with the increase already approved for 2017, the minimum wage level will soon exceed 40 % of the average wage and 50 % of the median wage (Graph 3.2.3).

Graph 3.2.3: Minimum wage in % of the national average wage



Source: European Commission - Eurostat

Gender pay gap

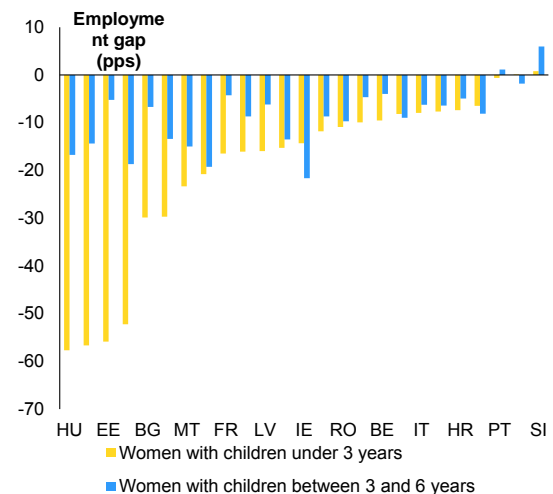
While the employment rate of women is relatively high, Estonia has the highest unadjusted gender pay gap in the EU (29.9 % in 2013 versus an EU average 16.4 %). The unadjusted gender pay gap is split into an explained component, such as education and occupation, and an unexplained (adjusted) component.

The explained gender pay gap in Estonia is estimated at 10.2 % and is driven by gender segregation in the labour market⁽³⁵⁾. Women cluster in industries with comparative low salaries

⁽³⁵⁾ Boll *et al.* (2016): Magnitude and impact factors of the Gender Pay Gap in EU countries (analysis carried out in 2015 on the basis of 2010 EU Structure of Earnings Survey; decomposition method of Oaxaca-Blinder close to the Eurostat methodology), forthcoming.

for a certain level of qualifications (especially education, health, social workers), while men are overrepresented in industries which offer high wages for a certain education level (mainly manufacturing, construction, transportation). Women in Estonia also tend to be in lower paid occupations: they account for almost 80 % of clerical support workers and 60 % of professionals, associate professionals and technicians, but less than 40 % of managers, although they have higher educational attainment than men. In 2014, occupational segregation in Estonia reached 30.7 % (EU average 24.4) and sectoral segregation reached 24.9 % (EU average 18.9). Another important factor is that female workers in Estonia more often work in part-time jobs with lower hourly salaries.

Graph 3.2.4: Employment rate of women aged 25-49



Source: European Commission - Eurostat - EU SILC 2013

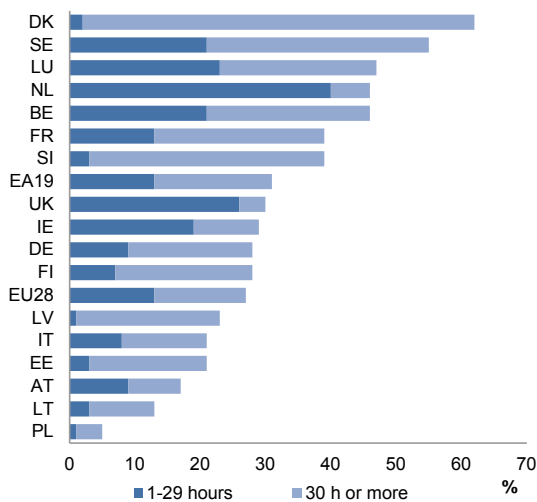
In addition to labour market segregation, women do not receive 'equal pay for equal work'. The unexplained gender pay gap is relatively high (14.9 % in 2010)⁽³⁶⁾. Though it is difficult to attribute causality empirically, various factors could contribute to this unexplained gap, including low transparency on wages in the private sector and low awareness. Wages in Estonia are usually negotiated bilaterally between employers and employees and there is some evidence that wage demand is lower among women than men, as

⁽³⁶⁾ Boll *et al.* (2016) (idem).

the unexplained gender gaps in wages desired and obtained are similar ⁽³⁷⁾.

Moreover, there are sizeable gender differences in actual work experience over the lifecycle. Prolonged career breaks, partly as a result of generous parental leave entitlements that are predominantly taken up by women, have a wage-reducing effect. The take-up rate of parental leave among fathers is very low: in April 2015, 7.5 % of beneficiaries were male. Parenthood has a high negative impact on female employment, especially for children under the age of 3 (Graph 3.2.4), while the impact on men is positive. The prolonged absence of mothers who take on childcare responsibilities can entail human capital depreciation, especially with respect to experience-related knowledge.

Graph 3.2.5: Enrolment of children up to three years old in formal childcare (2014)



Source: European Commission - Eurostat - SILC

The Estonian Government is planning some action in 2016 to address the gender pay gap by amending the Gender Equality Act and implementing the Welfare Plan. According to the government action plan for 2016, a legislative proposal in May will mandate labour inspectors to check that employers apply the principle of equal pay. Policy proposals on making the current parental leave system more flexible, including by

allocating part of the leave to the father, will be submitted to the government in spring 2016. The draft welfare plan 2016-2023, to be adopted in March 2016, includes strategic aims for employment, social protection, gender equality and equal treatment policies. For gender equality, the plan covers awareness raising, training and analysis, with activities to reduce the burden of care in the family. Social partners and civil society organisations have been consulted.

Early childhood education and care

There are still some shortages of early childhood education and care places for 0-3 year-olds, but the situation is improving. The proportion of children under three covered by formal childcare remains low, at 21 % in 2014, around 6 percentage points below the EU average (Graph 3.2.5). On the other hand, the proportion of children between the age of three and compulsory school age in formal childcare is among the highest in the EU. At the beginning of 2015, the unmet need for childcare was estimated at 2 335 places, mostly for children between 18 months and 3 years old, in 45 local communes in Estonia. Local governments are taking steps to solve the shortage and 604 places were created in 2015 with support from the European Social Fund. Another European Social Fund co-financed open call for 600 additional places will be launched in 2017. Additionally, up to 2 300 new childcare places will be created in bigger cities and suburbs with the help of the European Regional Fund. The amendment to the Pre-school Childcare Institutions Act, in force from January 2015, has given municipalities more scope to provide day-care services for parents of children under 3 years of age. The use of (private) day-care, in addition to formal childcare, is estimated at around 5-7 % in 2015 for children up to 3 years of age. In addition, the ministry responsible is working on integrating care conditions for day-care and childcare; a plan will be submitted to the government in February 2016.

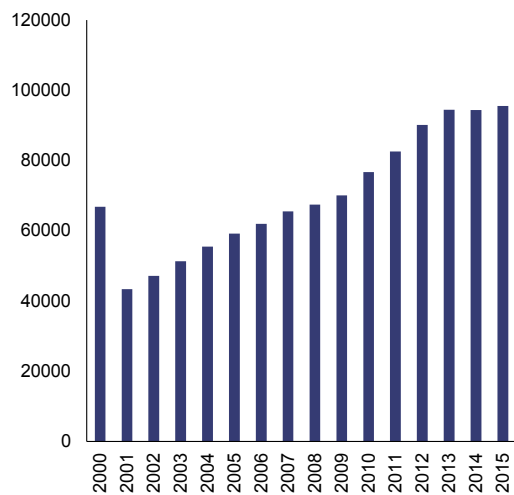
Work Ability reform

In 2015, more than 10 % of the working age population (around 95 500 individuals) received financial support under the incapacity for work scheme. Inflows increased particularly over the crisis years (with more than 17 000 first-time

⁽³⁷⁾ Meriküll, J., Mötsmees, P. (2014) Do you get what you ask? The gender gap in desired and realised wages. Bank of Estonia Working Paper Series 9/2014.

entrants in 2011) and remain high at around 13 500 new entrants in 2014. More than half of the beneficiaries are employed (almost 49 000 in 2014), as it is currently possible to combine pension rights under the scheme with employment income (Graph 3.2.6). Activation measures under the scheme were weak, however, and outflows from the scheme were scarce. Research suggests that the average beneficiary of the old scheme was low-skilled, older than 50, had become unemployed after having worked in sectors such as agriculture and manufacturing, had been inactive for 10 years or more, and lived in an area with low labour demand. ⁽³⁸⁾ This seems to point to potential use of the scheme as de facto income support for the long-term unemployed.

Graph 3.2.6: Persons receiving disability pension/pension for incapacity for work



Source: Statistics Estonia

With a view to addressing the shortcomings of the previous inefficient and costly incapacity for work scheme, the Work Ability reform entered into force on 1 January 2016. Major innovations of the reform are: (a) a new procedure to assess ability to work; (b) a broader set of active labour market services to help people enter the labour market under the scheme, such as counselling, training, work-related rehabilitation and a travel-to-work allowance; and (c) changes in the financial support scheme. Social partners and civil society

⁽³⁸⁾ Leppik, M. (2014) What characterises an average incapacity pensioner? Quarterly Bulletin of Statistics Estonia, 1/2014. .

representatives were involved in drafting the law, which resulted in numerous amendments. From 2016 the Unemployment Insurance Fund is the main implementing body for the reform. In addition to providing active labour market services, it will be responsible for the new assessment procedures and payment of allowances under the terms and conditions of the new scheme that will apply as of 1 July 2016. The system will be fully operational from January 2017, when the re-assessment of current beneficiaries starts. The estimated number of people with a partial ability to work who will receive services under the reform by 2023 is around 54 000, or over half of the current recipients of an allowance for incapacity for work, according to government estimates. More information on the delivery of social services is provided in section 3.5.

The government also intends to address bottlenecks in labour market participation such as high costs of transportation and care obligations.

As part of the Work Ability reform, a temporary mobility allowance will be offered to allow the unemployed to accept jobs more than 30 km from home. The measure is in line with previous research results, suggesting that the largest obstacle to working further away from home is the high cost (41 % of respondents). ⁽³⁹⁾ The Government has also set up a high-level task force to identify integrated solutions (social, health, employment, etc.) to care responsibilities within two years. The government has invited representatives of policy developers, local governments, universities, experts, private and public service providers to this task force. Over 15 000 persons are providing care for family relatives in Estonia.

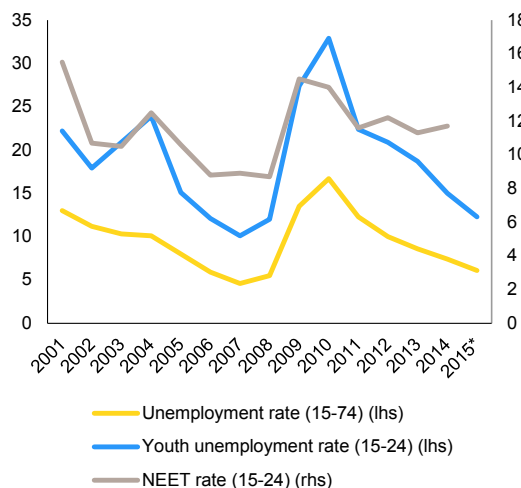
Youth employment

Youth unemployment continued to decline and the proportion of youth not in employment, education or training (NEET) remained constant. Youth unemployment declined, from 18.9 % in 2013 to 15.9 % in 2014, significantly below the EU average of 22.2 %. NEET rates, in contrast, remained broadly stagnant at 11.7 % in

⁽³⁹⁾ RAKE, (2011): Töäjõu siseriikliku mobiilsuse uuring (Analysis of domestic mobility among labour force), Centre for Applied Social Sciences. http://www.ec.ut.ee/sites/default/files/ec_files/Pendelr%C3%A4nde%20l%C3%B5ppraport.pdf

2014, slightly below the EU average of 12.5 % (Graph 3.2.7). Compared to the EU average, the Estonian population of young people who are not in employment, education or training includes a significantly higher share of young people who are inactive due to family responsibilities and illness or disability. This share is higher among those with low educational levels (ISCED 0-2 — pre-primary, primary and lower secondary education).

Graph 3.2.7: Performance of young people (15-24) on the labour market



(1) Unemployment rate (% of labour force), total (left axis)
 (2) Youth unemployment rate (% of labour force), total (left axis)
 (3) NEET: Not in employment, education or training (% of population), total (right axis)
 (*) Average of first three quarters of 2015. Data for total unemployment and youth unemployment rates are seasonally adjusted
 Source: European Commission - Eurostat - Labour Force Survey (LFS)

New measures were launched in 2015 under the Youth Guarantee, to improve school-to-work transitions. A first measure involves the organisation of school-to-work workshops providing labour market information, targeting students in grades 8-12 (the last two grades of basic education and the first three grades of general secondary education). Labour market information provision is expected to better align students' expectations with regard to study choices and labour market outcomes with reality, and as a result reduce dropout. A second measure ('My first job') helps young people who have either no qualifications or a general upper secondary diploma and who have been registered as

unemployed for at least four months to gain professional skills through work-based learning. Employers who offer these youngsters an open-ended or fixed-term contract (for at least two years) which includes a learning component are eligible for a one-year wage subsidy (up to 50 % of the wage, with a ceiling set at twice the minimum wage). The State also covers the social tax (33 %) based on the minimum wage.

Health system

Life expectancy and healthy life expectancy, along with cardiovascular disease and cancer mortality, are causes for concern. A more detailed analysis suggests that lifestyle factors (e.g. alcohol consumption) are the main cause of these health problems. In addition, the percentage of people who leave the labour market due to health problems indicates that Estonians' current health conditions have an impact on the size and quality of the labour force and on the growth potential of the economy.

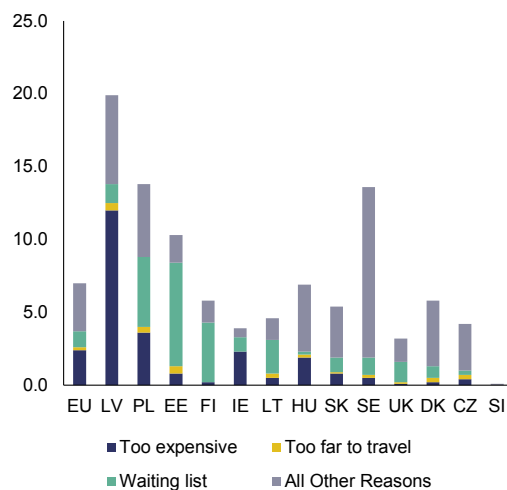
Estonia has a significant problem with healthcare accessibility. The percentage of people who reported having problems with access to healthcare due to a long waiting list is the highest among all Member States (7.1 % of the population — compared to an EU average of 1.1 % — see Graph 3.2.8) and has been increasing since 2009 (when it was reported by 2.9 % of the population). According to national statistics, access difficulties are more frequently reported in relation to specialised care. According to the Estonian Health Insurance Fund this is not a matter of financing, but rather of organisation of the system and division of work between health professionals. The number of nurses per 100 000 inhabitants, at 648.4, is lower than the EU average of 850. The outflow of health professionals, coupled with the ageing of the health workforce, may even worsen future healthcare accessibility.

In order to improve the access to health care, the Estonian authorities have adopted the following measures: for 2016, Estonia has increased the Health Insurance Fund budget by 6.4 % compared to 2015, and the budget for nursing services by 12 %. These changes cover wage increases and an increase in the number of health professionals trained. Estonia plans to invest EUR 141 million of ERDF funding in 2014-2020

to extend and increase the share of primary healthcare services and deliver specialised medical care in a more efficient way and tackle alcohol abuse and addiction.

Efforts are being made to remedy the financial constraints of public long-term care due to limited local government and Estonian Health Insurance Fund budgets. In 2013, only 0.6 % of GDP was spent on long-term care in Estonia. Since then, in order to alleviate the problem of a shortage of long-term care facilities and home care services, the government has allocated additional funds from the EU structural funds for 2014-2020.

Graph 3.2.8: Self-reported unmet needs for medical examination by detailed reason (% of respondents, 2013)



Data are sorted by self-reported unmet needs as a result of financial constraints, distance, and waiting lists
 Source: European Commission - Eurostat, EU-SILC data

Social policies

Since 2010, Estonia has experienced a gradual increase in the population living in poverty or social exclusion from 21.7 % in 2010 to 26 % in 2014, against an EU average of 24.5 % ⁽⁴⁰⁾. While the share of the population living in severe material deprivation and in households with very low work intensity is well below European

⁽⁴⁰⁾ The at-risk-of-poverty and social exclusion rate is defined as the share of the population which is either in at-risk-of-poverty (i.e. has an equalised disposable household income below 60 % of the national median), or severely materially deprived, or living in a household with a very low work intensity.

averages and declining, the at-risk-of-poverty rate increased to 21.8 % in 2014, 4.6 percentage points above the EU average. This is mainly due to an increase in the relative poverty threshold, as median equalised disposable household income is increasing rapidly. However, not everyone is benefiting from this income growth, in particular those who live off benefits. The at-risk-of-poverty rate for the unemployed stood in 2014 at 54.7 %, the fourth highest in the EU and well above the EU average of 47.2 %; for retired persons it stood at 32.6 %, more than twice the EU average. Elderly people are increasingly falling below the at-risk-of-poverty threshold as a result of the strong concentration of pensions around the threshold ⁽⁴¹⁾.

Spending on social protection as a percentage of GDP has decreased continuously and social safety nets in Estonia do not provide adequate income support. Spending decreased from 19.0 % of GDP in 2009 to 15.1 % in 2013 and is now among the lowest in the EU. Spending is particularly low on pensions (6.7 % of GDP; EU: 13.0 %), unemployment benefits (0.5 %; EU: 1.5 %) and social assistance benefits (0.1 %; EU: 0.5 %). The annual indexation of the public pension scheme (at 20 % of the CPI and 80 % of social tax revenues) ensures some alignment with rising living standards. Still, the flat rate 'national pension' for pensioners with less than 15 years of contributions (currently 1.4 % of all pensioners) remains low at EUR 144. From 2015, the tax-exempt amount for pensions was raised, which improved pension adequacy. The unemployment allowance was raised by 10 % in 2016. The subsistence benefit scheme, paid according to the Social Welfare Act, topped up household income to EUR 90 for the first person in the household and for every child, and to EUR 72 for each additional adult household member in 2015. This has been raised to EUR 130 from 1 January 2016. The minimum amount necessary to pay for basic expenses was estimated at EUR 203 for a single individual in 2014 by Estonia Statistics. Recent social measures have mostly targeted children: the universal child allowance and the needs-based family benefit were raised in 2015 and 2016, and

⁽⁴¹⁾ In the third quarter of 2015, the average pension stood at €371, while the at-risk-of-poverty threshold stood at €361 in 2014.

further gradual increases in the universal child allowance have been decided for the coming years.

Although relatively high at current replacement levels, the long-term sustainability of the pension system is being examined with a view to strengthen it further, which could also have a positive impact on labour supply. A working group of experts and stakeholders led by the Ministry of Social Affairs is analysing the Estonian pension system, in particular the pension insurance scheme and pensionable age, including the possibility of linking it with life expectancy. The working group has to submit the results of its analysis to the government by March 2016.

Education, training and skills

Estonia is generally performing well on education and training, but there are still problems in closing the gender gap and strengthening human capital with a view to increasing productivity and shifting to a high-value economy. Estonia has high rates of tertiary attainment and performs well in international skills surveys such as PISA and PIAAC. Participation in lifelong learning is above the EU average. However, some challenges remain: early school leaving, gender gaps in educational participation and performance, and bringing vocational education and training more into line with the labour market.

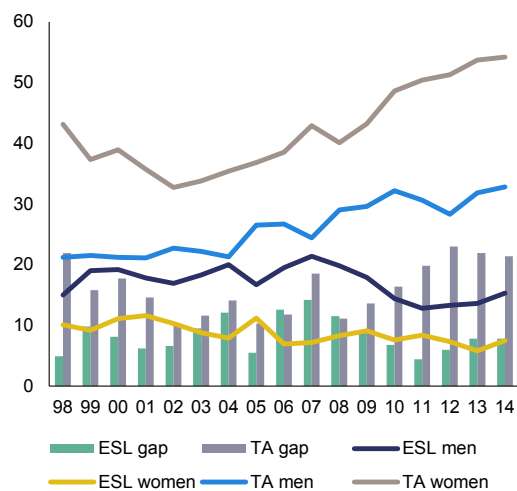
With a view to strengthening education and training systems at all levels, the ‘Lifelong Learning Strategy 2020’ is being implemented. A detailed action plan and thematic programmes were produced in 2015, including specific monitoring benchmarks and a budget for 2015-2018.

The reform of the upper secondary school system is ongoing. Estonia has begun to consolidate the upper secondary school network for general education in order to make public spending more efficient. It has also launched an investment programme aimed at raising quality and adapting upper secondary education to Estonia’s rapidly changing demographics and to labour market developments. Between 2014 and 2020, funding for this project will total EUR 256 million, including EUR 218 million from the European Regional Development Fund. However,

the quality of upper secondary education varies from Estonian-language schools to Russian-language schools. A gradual shift to Estonian-language upper secondary schools is taking place as the transition period for such a move is ongoing.

Estonia’s early school leaving rate is close to the EU average, but has been slightly increasing since 2011 and there are significant differences between rural and urban areas, and between women and men (see Graph 3.2.9). In 2014, the early school leaving rate was 17.3 % in rural areas and 15.2 % in towns and suburbs, as compared to 4.7 % in cities. Moreover, between 2011 and 2014 the gender gap in early school leaving increased, with the rate for males being more than twice that of females at 15.3 % and 7.5 % respectively. The national lifelong learning strategy contains objectives and associated measures to address early school leaving challenges by 2020, including a new school financing model and an investment programme to guarantee access to a quality basic education close to the place of residence.

Graph 3.2.9: EU 2020 headline indicators for early school leavers (ESL) and tertiary attainment (TA) by gender



Source: European Commission - Eurostat

The consolidation of career guidance and counselling mechanisms is continuing. The study and career counselling programme (2014-2020) was presented by the Ministry of Education and Research in late 2014 in conjunction with the implementation of the national lifelong learning strategy. The existing county centres for career and

education counselling were merged from September 2014 into a single state-funded system (*Rajaleidja keskus* or ‘Pathfinders’), which aims to provide systematic and coordinated career services comprising information and counselling.

The government is implementing reforms to raise the proportion of vocational education and training (VET) students in apprenticeships, and to address the high number of VET dropouts. Compared to the academic year 2013/2014, the dropout rate increased in 2014/2015: there were slightly over 6 400 dropouts and less than 50 % of students graduated within the normal timeframe. The reasons for dropping out are in most cases a combination of wrong choice of specialisation, insufficient academic progress, and lack of support and guidance at school ⁽⁴²⁾. In April 2015 the government adopted, and is now implementing, a VET programme for 2015-2018 that, with funding from the European Structural and Investment Funds, will modernise the work experience system, extend the apprenticeship programme and develop entrepreneurship training.

Cooperation with social partners on VET and apprenticeships is picking up. A survey of Estonian employers conducted in 2013 ⁽⁴³⁾ shows that employers in general are dissatisfied with the cooperation between vocational education schools and employers. Therefore the coordinating body for the vocational programmes — Foundation Innove has intensified cooperation with the Employers’ Confederation to raise awareness of apprenticeships among its members. Under the lifelong learning strategy 2020 (as implemented by the VET programme 2015-2018), the aim is to raise the number of students in apprenticeship training gradually from 700 in 2015 to 5 200 by 2018.

Tertiary educational attainment is high and the implementation of the Higher Education Act is showing good results, but the gender gap needs further attention (see Graph 3.2.9). Estonia’s tertiary educational attainment rate for the 30-34 age group increased by around 15 pps. between 2004 and 2014 and is well above the EU average (43.2 % compared to 37.9 % in 2014). Women perform significantly better, with a tertiary educational attainment rate of 54.2 %, as compared to 32.8 % for men. Students in science, technology and mathematics subjects represented 28.9 % of all higher education students in 2014, which represents substantial progress considering Estonia’s aim to foster a technology-intensive economy and the forecast increase in labour market demand. The reforms introduced by the Higher Education Act from September 2013 are starting to deliver good results ⁽⁴⁴⁾.

To improve the alignment between education and the labour market, a public system for monitoring and forecasting labour market and skills developments is under development (OSKA). Results from OSKA will support the shaping of qualifications, assist curriculum development in educational institutions, and form the base for the establishment of a career counselling service. Three pilot projects have been launched in 2015 in ICT, forestry and wood, and accounting. Sectoral analysis for the metal and engineering industry and for social work will be launched in 2016. To increase the quality of entrepreneurial skills, an entrepreneurial education programme started in 2016 with a view to addressing the lack of teaching materials and guidelines, and making teaching more practical. Teaching in entrepreneurship and business administration in all fields (vocational and higher education) will be encouraged.

⁽⁴²⁾ RAKE, CPD 2012: Reasons for dropping off from vocational education in Estonia. [Õpingute katkestamise põhjuste kutseõppes.]. Tartu University, CPD, 2012. <http://www.hm.ee/index.php?popup=download&id=12110>.

⁽⁴³⁾ Nestor, M., Nurmela, K. (2013) Kutseharidus ja muutuv tööturg. Tööandjate uuringu lõpparuanne. (Vocational education and the changing labour market. Final report of employer’s survey). Tallinn: Praxis Center for Policy Studies. <http://www.praxis.ee/wp-content/uploads/2014/03/2013-Kutseharidus-ja-muutuv-tooturg.pdf>.

⁽⁴⁴⁾ For instance, (a) the new funding system, which establishes sectoral objectives in performance contracts and facilitates support for nationally important areas of development (e.g. the ‘smart specialisation’ areas), and (b) the incentives for increased participation in higher education offered by needs-based study allowances and conditional free tuition options.

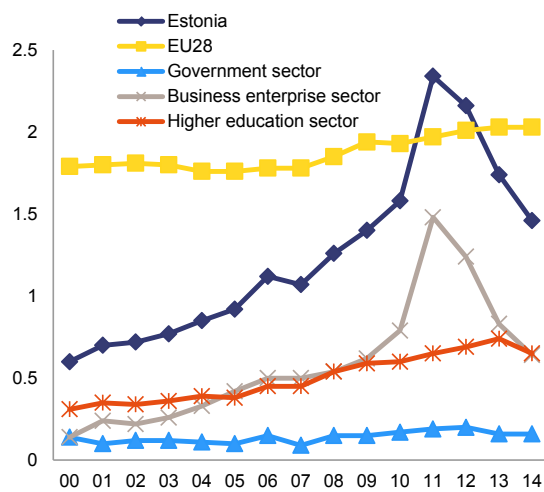
3.3. TECHNOLOGICAL DEVELOPMENT

Estonia faces a number of R&D and innovation challenges, particularly in the sustainability of its funding streams, insufficient prioritisation and a lack of critical mass in support of the country's smart specialisation. This situation is compounded by the small number of companies investing in research and innovation, the low level of cooperation between science and business ⁽⁴⁵⁾ and the scarcity of human resources, together with low internationalisation. The 2014-2020 Operational Programme is set to address the challenges, but activity has only just or will shortly be started.

R&D and innovation

In 2014, the overall level of R&D investment in Estonia as a percentage of GDP (1.46 %) fell further below the EU average of 2 % (see Subsection 2.1) (see Graph 3.3.1).

Graph 3.3.1: Gross domestic expenditure on R&D (GERD)



Source: European Commission - Eurostat

In addition, according to the Innovation Union Scoreboard 2015, Estonia moved down from the ‘innovation followers’ group to the ‘moderate innovators’ group. Its innovation performance increased at a steady rate until 2013, to decline in 2014. Estonia scores well below the EU average in most innovation indicators. These low levels are explained by the slowdown in public research,

⁽⁴⁵⁾ As reflected by the still low level of privately funded public R&D (0.034 % of GDP in 2013) and the low level of public-private co-publications per million population (20 in 2012 compared with an average of 50 for the EU).

development and innovation funding, stemming mostly from the fact that Estonia is caught in between two EU programming periods (instruments from previous period have come to an end but new ones have not yet fully taken off). However, another major contributing factor is the clear underperformance of the business sector. Its past growth in investment (from 2009 to 2011) was due to some non-recurrent large-scale investments in one particular sector (oil shale).

Increasing R&D and innovation funding from the state and local budgets to 1 % of GDP in 2020 remains a crucial, yet ambitious goal. This is expected to ensure the longer-term sustainability of Structural Funds-related public investment.

Smart specialisation

Estonia made some progress in 2015 by taking further measures to implement its research, development and innovation strategy ‘Knowledge-based Estonia’ and the Entrepreneurship Growth Strategy, which together comprise its framework for smart specialisation. However, using synergies in these strategies remain critical to boosting private research, development and innovation investment.

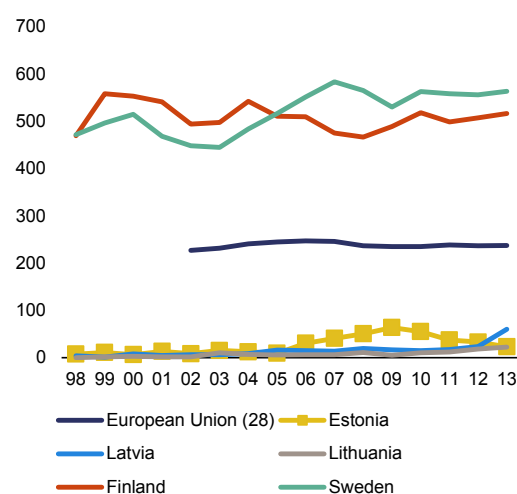
The smart specialisation areas could be narrowed down and their practicality increased for future international competitiveness. This could be done through a bottom-up process involving relevant stakeholders, in particular from the private sector. The Estonian Development Fund is tasked with surveillance and analysis of growth areas working with businesses, to find the narrower niches which show the greatest potential in selected areas. No outputs were reported in 2015, but the steering committee for cross-field management of smart specialisation, in which the fund also is represented, appears to have helped review the relevant draft conditions for support to implement the smart specialisation framework through the Operational Programme.

Cooperation between businesses and academia

Cooperation between businesses and academia is slowly improving but remains underdeveloped, resulting in a still low level of patent applications (see Graph 3.3.2). Also, the

gap between the supply of knowledge from research-performing organisations and the demand from local industry is illustrated by the relatively low amount of funding universities receive from the business sector (less than 5 % in 2014). The Ministry of Education and Research took measures to support stronger science-business links, such as including contract research for the allocation of universities' core funding and providing support for research infrastructure by fostering openness to businesses and industrial PhD schemes. The measures for developing technology transfer capacity in universities had positive results and units for intellectual property rights protection have become operational. However, in spite of the increase in the amount of intellectual property protected, marketing and commercialisation of intellectual property remain a challenge.

Graph 3.3.2: Patent applications to the European Patent Office (by priority year and per million people in the labour force)



Source: European Commission - Eurostat

The business sector is making progress in increasing its research, development and innovation investment, but these investments are concentrated in a limited number of companies, often in traditional low added-value sectors. Together with financial and non-financial measures to support companies with high growth potential, the government is amending the Public Procurement Law to foster innovation procurement. Enterprise Estonia supports the procurement of innovative solutions by providing

financing for training and development of know-how and encouraging dialogue between contracting authorities and the private sector. There are some encouraging signs in manufacturing, where external expenditure on R&D (performed outside the business, e.g. in a scientific institution) increased in recent years.

Instruments to promote technological innovation have been put in place. This includes funding of six technology centres for seven years with the aim of making them sustainable without separate state support; it also includes an innovation voucher system enabling SMEs to cooperate with universities and competence centres, which is gaining popularity. The innovation voucher and the development voucher schemes are also intended to strengthen intellectual property protection. At the same time, the first calls under the Applied Research Programme are ready to be launched, with an injection of EUR 26.6 million (0.1 % of GDP) to support applied research between business and academia and increase private investment in research, development and innovation. The innovation voucher scheme will continue to be used as a support tool.

In addition, the launch of a high-growth business development programme was planned for January 2016. The programme aims to provide support for businesses with the potential to grow. It includes coaching, consultancy, mentoring, training, access to finance and export advice. Finally, the new calls for proposals under the 2014-2020 cluster development programme were open from June 2015.

Internationalisation of research

The 'internationalisation of research' programme was successful in the last programming period, with more than 30 top-level projects receiving support. A new programme will be launched in 2016. In addition, Estonia has a programme to help implement the research infrastructure roadmap (including the EU-level roadmap under the European strategy forum on research infrastructure). Estonia's participation in EU-wide Horizon 2020 calls for proposals for R&D funding proved successful, particularly its SME participation.

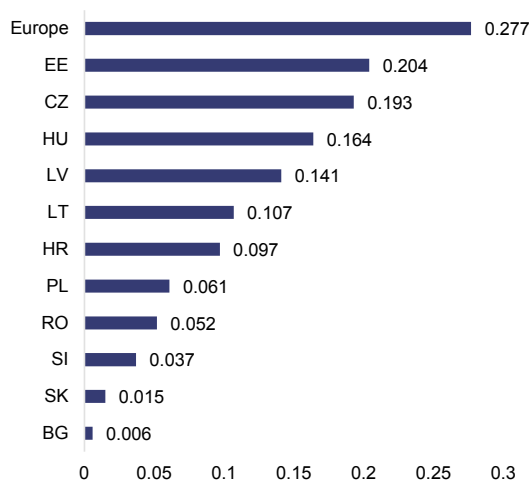
Access to finance

The number of loan applications rejected fell, but the indicator measuring entrepreneurs' fear of failure remained high at 39 % in 2015. This can be explained to some extent by the uncertain economic situation in the main trading partners, the labour market challenges and the low ambitions of Estonian companies.

Banks play a larger role in the financing of companies than does the capital market. The total stock of loans to corporations is 34 % of GDP, compared with 8.6 % of GDP for listed equity and 7 % for debt securities. The stock market is relatively shallow, with capitalisation amounting to EUR 1.9 billion (about 10 % of GDP) in 2015. Capitalisation from all funding sources — in particular equity (see Graph 3.3.3) — is below the EU average. On the other hand, the annual gross operating surplus of Estonian companies is higher than the EU average, suggesting that companies may find it relatively easy to finance investment from retained profits.

Access to finance in Estonia is showing some progress with the development of new financial instruments and venture capital. Crowd-sponsoring and crowd-lending platforms have been operating for several years in the country and the first equity crowdfunding platform started its activities in August 2015. The business angels community is slowly growing. Created in 2012, the Estonian business angels' network, EstBAN, currently has about 100 members. In 2014, it invested EUR 4.8 million in 65 companies, making Estonia one of the best performing countries by investment-to-GDP ratio. A new seven-year programme to support start-ups in Estonia was expected to be launched in early 2016.

Graph 3.3.3: Private equity investments as a percentage of GDP - 2014



Source: European Venture Capital Association (2015), Central and Eastern Europe Statistics 2014

The venture capital market in Estonia is not yet fully developed (see Table 3.3.1) and still relies to a large extent on public support, especially at the early stage of financing. Venture capital investments are supported by KredEx, a state financing institution, through a fund of funds. The main objective is to help Estonian companies at the seed, start-up and growth stages. Early stage support is also provided by the Estonian Development Fund through the Startup Estonia initiative. Also, the action plan on building a capital markets union, adopted by EU institutions in September 2015, includes a commitment to promote the development of capital markets in all Member States, as part of the European Semester. In terms of private equity investment as a percentage of GDP, Estonia is still below Europe's average.

SMEs' access to finance still needs to be improved. High collateral requirements still appear to be one of the main problems for small companies. Bank lending and support measures provided by Enterprise Estonia and KredEx mainly benefit enterprises with strong growth and export potential. Conversely, SMEs with smaller financial capability and business ambitions experience difficulties in accessing finance. The banking sector does not offer enough funds for these high-risk businesses, and the venture capital market is improving, but still underdeveloped.

However, on 18 December, agreement was signed on a first project backed by the European Fund for Strategic Investment⁽⁴⁶⁾ that will give companies the opportunity to obtain loans for high-risk projects. The COSME counter-guarantee agreement will allow KredEx to support loans and leases to 1 000 SMEs to the tune of EUR 200 million (1.0 % of GDP) over the next three years. KredEx will provide subordinated guarantees to banks and leasing companies for investment loans, working capital loans, leases, overdrafts and bank guarantees.

Table 3.3.1: Venture capital investments as a percentage of GDP (2014 or latest available year)

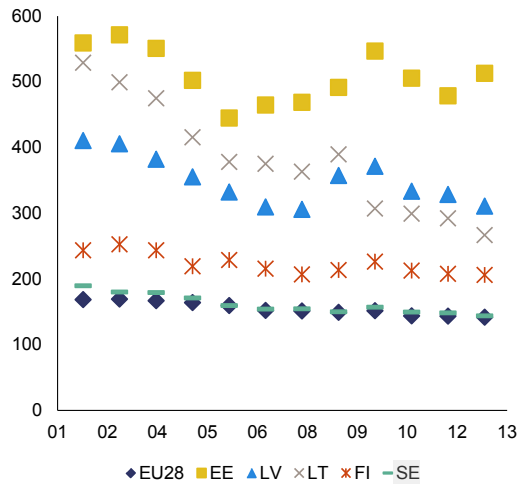
Country	Seed/start-up/early stage	Later stage venture
Sweden	0.03060	0.03546
Finland	0.04197	0.01852
Estonia	0.00596	0.01659

Source: OECD

⁽⁴⁶⁾ <http://www.eib.org/efsi/index.htm?media=shortlink>

3.4. INFRASTRUCTURE AND ENERGY EFFICIENCY

Graph 3.4.1: Energy intensity of the economy: gross inland consumption of energy divided by GDP (kg of oil equivalent per EUR 1000)



Source: European Commission - Eurostat

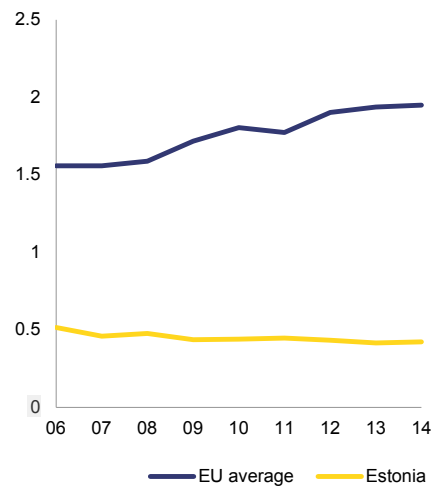
With the liberalisation of its electricity and gas markets and the construction of new energy infrastructure, the competition in the energy market has substantially improved in recent years. However, Estonia still has a lot of work to do on energy and resource intensity (and on resource productivity) and the progress achieved so far seems rather limited (Graphs 3.4.1 and 3.4.2). In particular, primary energy intensity of the economy has increased substantially since 2005 in contrast to the trends in the EU. Current developments also indicate that the country is not on track to meet some of its energy efficiency targets by 2020. On the other hand, with renewable energy sources at 26.5 % of total energy consumption in 2014, Estonia has exceeded its 2020 renewable energy target ahead of time. There has been only limited progress towards reaching the binding 10 % renewable energy sources target in transport — renewable energy sources share remains below 1 %.

Energy efficiency

Estonia's primary energy intensity has increased by more than 20 % (21.3 % by 2013) as compared to a decrease of nearly 10 % in the EU. Estonia's performance in terms of final energy consumption is weaker than in other Member States. The intensity rate remains broadly stable

against a downward trend in most of the other Member States.

Graph 3.4.2: Resource productivity in Estonia, compared with the average EU resource productivity



Source: European Commission - Eurostat

Energy efficiency in buildings

Around 33 % of Estonia's energy is used by households. Therefore, improvements in the household sector could have a large positive impact. Estonia has planned to use about EUR 100 million (0.5% of GDP) from the European Structural Fund during 2014-2020 to renovate apartment buildings, but the impact on the whole stock of residential housing would be rather small. Estonia uses approximately 50 % of the revenues from auctioning allowances under the emissions trading system — EUR 9.0 million in 2013 and EUR 7.4 million in 2014, in support of energy efficiency and modernisation of energy systems.

The government is planning to introduce a regulation on district heating systems which will give networks incentives to reduce losses from 22 % currently to 15 % by 2017. It has also proposed a draft regulation that encourages the use of renewable biomass in district heating. It aims to improve the energy efficiency of public buildings in compliance with Directive 2012/27/EU on

energy efficiency. However, the implementation of some important features of the energy efficiency directive is still unclear and/or missing. These include mandatory audits in large companies, the setting-up of an energy efficiency obligation scheme, the setting-up of an energy efficiency national fund, and the installation of individual consumption meters in multi-apartment buildings. These points are expected to be included in a legislative act currently under discussion.

Energy efficiency in transport

The energy intensity of the transport sector is improving but remains above the EU average.

From 2005, the index for Estonia fell by around 21 % [by 2013], which is slightly faster than the rest of the EU. The incentives for energy efficiency are weak in the transport sector, which is reflected in the low energy efficiency profile of transport vehicles. In 2014, passenger cars bought in Estonia featured the highest emissions rate (141 g CO₂/km) in the EU. Transport taxes (excluding those on fuel) remain among the lowest in the EU and there is no vehicle taxation⁽⁴⁷⁾. In 2014, transport taxes stood at 0.1 % of GDP compared to an EU average of 0.5 % of GDP. However, the government is working on a proposal to introduce a road fee for heavy goods vehicles from 2018. A positive impact can be also expected from the planned increase in the fuel excise tax, which has also been set to gradually rise by more than 30 % in total until January 2018. This is likely to shift consumer preferences towards more energy-efficient cars. To improve transparency for consumers, an energy efficiency labelling scheme is being introduced from 2016. An online registry will allow users to view information about the energy efficiency of all new cars. However, inclusion of older models in the registry is voluntary.

Measures for shifting consumer preferences to electric cars have not or are unlikely to produce considerable improvements. Between 2012 and 2014, Estonia built up an Estonia-wide network of fast-charger stations under the Electro-Mobility

programme. However, the number of new electric cars bought has drastically gone down, since the grant budget supporting the introduction of electric cars was depleted in 2014 after putting slightly more than 1 000 cars into circulation.

Limited access to public transport in non-urban areas is also contributing to high reliance on passenger cars.

However, interurban long-distance coach transport was liberalised in 2015 and is expected to encourage more cost- and energy-efficient alternatives through private service providers. In passenger logistics, the government also supports the development of intelligent transport systems, while in freight logistics the private sector is introducing innovative technological solutions that are also exported to other parts of Europe and the world.

Initiatives are being taken to promote the use of renewable energy in transport.

Estonia has a national target to increase the use of renewables to 10 % by 2020 and in particular for bio-methane to 5 % of all fuels by 2020. The government's annual plan foresees building an Estonia-wide charging network by 2018. Production of bio-methane is also being promoted, and further measures for promoting the use of bio-methane and other renewable fuels in transport are being considered. Furthermore, recent tenders for public transport concessions in several counties replaced ordinary buses with bio-methane-fuelled buses. Efforts to promote green energy in the transport sector are thus contributing to the overall 2020 target for the use of renewable energy.

Energy markets and infrastructure

The functioning of the electricity market has substantially improved

since full liberalisation of the retail segment at the beginning of 2013 and the launch of the EstLink 2 electricity line with Finland in 2014. The latter has substantially increased Estonia's connectivity with the Nordic power market, enabling Estonian and other Baltic consumers to benefit from increased security and competition on the market. The Baltic market received a further boost in December 2015 when Lithuania connected its electricity network to Sweden and Poland. The integration of the Baltic electricity market with the rest of the EU will reduce demand for power transmission through Estonia and Latvia and will largely remove

⁽⁴⁷⁾ See Study on Environmental Fiscal Reform Potential in 12 EU Member States, by D. Hogg et al. (2014). See also Lamine, B. and Löhmuste, E. (2014) 'Do the Baltic States need to tax passenger cars more?', Country Focus volume 12, issue 11, ECFIN, European Commission, November 2014.

congestion risks on the Estonian border with Latvia. These risks will be completely eradicated with the completion of the third electricity interconnection between Estonia and Latvia, work on which is advancing on schedule. The progress made in connecting the Baltics to the EU power market paves the way for full alignment of the power grids in line with the countries' strategic goals. The three Baltic states agreed in the first quarter of 2015 on a common strategic goal of desynchronisation from the Russian IPS/UPS system and fully integrating their power systems with the continental European network. The synchronisation project is included as a key infrastructure project in the European energy security strategy, and is highlighted as one of the key energy priority areas in Baltic energy market interconnection plan.

Estonia's natural gas market remains largely dependent on Russian supplies, but since 2015 the country has been diversifying its imports.

Estonia has natural gas connections with Russia and Latvia. Gas imports flow primarily from Russia to Latvia and then from the Latvian underground gas storage in Inčukalns to Estonia. Since the launch of the liquefied natural gas (LNG) terminal in Lithuania at the end of 2014, Estonia has managed to sign gas imports deals with Lithuania, but the level of diversification and security of supplies is still moderate. However, the first gas deals with Lithuania have been a successful test for the liberalisation of the Estonian gas market. Further progress in the area can be achieved by building the first gas interconnector with Finland (the Baltic connector) and the Poland-Lithuania gas interconnector (GIPL), which will end the gas isolation of the Baltic states.

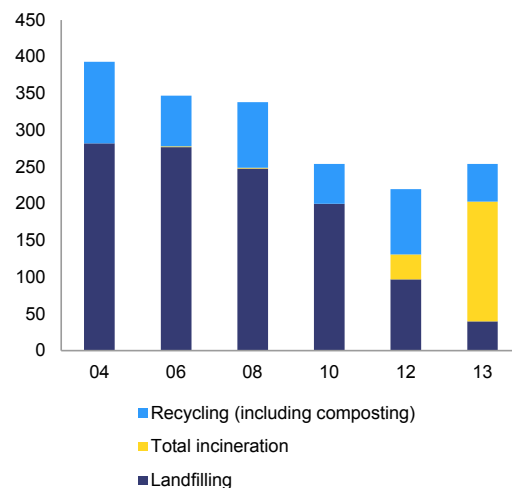
Transport infrastructure

Investment in transport infrastructure is highly dependent on EU funds, while the prospects for providing sustainable long-term financing for infrastructure maintenance and upgrades through national financing remain unclear. While the quality of main roads is being maintained or is improving, the condition of secondary roads is worsening. The possible road fee for heavy goods vehicles is not planned to be directly aimed at increasing national financing for road infrastructure.

In a similar way to road infrastructure, investment in railways is also highly dependent on EU funds. Some progress has been made on cooperation with Latvia and Lithuania in the planning of the European-gauge project Rail Baltic, connecting Estonia to the European rail network. Planned to be completed by 2024, Rail Baltic was pre-identified under the Connecting Europe Facility. The project should provide the impetus for a modal shift to rail transport for freight and improve rail connectivity in passenger transport. It should also introduce rail/road intermodal terminals to Estonia, other than those currently in ports.

Waste management

Graph 3.4.3: Municipal waste by treatment type (2004-2013)



Source: European Commission

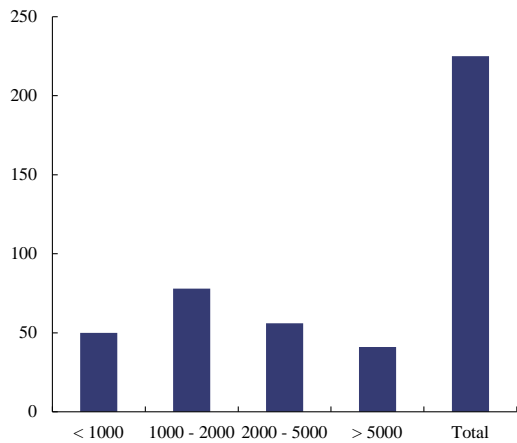
Progress in municipal waste management has been rather limited.

The significant increase in municipal waste incineration and the decrease in recycling pose a risk that Estonia will not be able to meet its 50 % recycling target by 2020, let alone the proposed 65 % recycling target to be met by 2030. Waste management appears underdeveloped in areas such as separate collection, recycling, composting, limiting incineration to non-recyclable waste, and producing combined heat and power from closed landfills. (Graph 3.4.3).

3.5. LOCAL GOVERNMENT REFORM

The possibility of reforming local government and thereby promoting competitiveness and inclusive growth has been discussed for over a decade. Of Estonia's 213 municipalities, around half currently have a population of under 2000 inhabitants (Graph 3.5.1). Public services are provided by local authorities according to the priorities they themselves set. Cooperation between municipalities is picking up, but slowly.

Graph 3.5.1: Number of municipalities and cities by population size (2011)



Source: Statistics Estonia

Many public services to individuals, such as social services, transport, education, childcare and care for the elderly have been provided unevenly and with variable quality throughout Estonia. The varying level of local services has been explained by the small size of many municipalities and the ensuing limited financial means and ability to attract a competent workforce at municipal level. The lack of minimum requirements and of the central monitoring system has also been detrimental for the provision of social services. The inadequacy of social services has a direct negative impact on the efficiency of activation measures that they are expected to support. This challenge is particularly important in the context of the Work Ability reform, which relies on the availability of social services at local level.

The funding principles of local government limit the capacity of the poorest municipalities to better match revenue with their devolved responsibilities. In particular, the Equalisation

Fund scheme ensures a quasi-automatic redistribution of revenue to the poorest municipalities. Without any incentives for them to attract enterprises or support job creation, this acts as a disincentive to take such initiatives. In addition local government currently has no legal obligation to support entrepreneurs or potential investors.

The government has committed itself to making progress on the administrative reform, including the local government reform, first by streamlining all responsibilities at government level under the Ministry of Finance. The proposed Administrative Reform Act is expected to be submitted to the government in March 2016, with adoption expected in June. This would pave the way for the local government reform, involving both voluntary and government-initiated mergers, which will both take effect from the local elections in October 2017. The aim of the mergers is to make economies of scale, offer accessible and quality services and provide more efficient and competent governance. The draft act that was publicly consulted upon sets a minimum criterion of 5 000 inhabitants that would enable local authorities to offer an adequate choice of services, hire more specialists and have scope in the budget for investment. In the initial phase (up to the end of 2016), the government is offering financial incentives to promote voluntary mergers. From 2017, the government would itself take the initiative to merge municipalities, without financial support.

Progress has also been made on setting minimum requirements for nine social services through amendments to the Social Welfare Act. These amendments entered into force in January 2016, with an obligation on local authorities to revise their implementing regulations to ensure application of the requirements from April 2016. The quality of social services is determined by defining the scope for every single service, concrete objectives and minimum standards such as qualification requirements for staff providing the services. This step will lay the basis for developing a common framework that should ensure uniform quality for the services concerned all over Estonia and better access to the services. For people in need of these services, local authorities will have to take the necessary measures (alone or in cooperation with other local

authorities) to comply with the stipulated quality standards. The provision of childcare is already showing good signs of improvement (see section 3.2).

In terms of local government finances, mergers between local authorities are expected to partly address financial disparities between the new entities and reduce any discrepancies between local revenues and responsibilities. Mergers are expected to reduce the need for an Equalisation Fund. Changes to the latter are, however, being considered to remove the remaining disincentives for municipalities to attract businesses. Also, under the planned reform local authorities will in future be entrusted with additional responsibilities, including the development of local entrepreneurship. No change to local taxation is currently considered.

The Operational Programme 2014-2020 for cohesion policy funds involves activities to increase the professional competence and management of general government, and to develop e-government services and applications to provide public services. Although the above activities aimed at strengthening administrative capacity in Estonia are targeted mainly to central government, one of them (European Social Fund activity 'Development capacity at the local and regional level') is linked with the local government reform.

Regional development

As regards fostering economic development and entrepreneurship in regions faced with high unemployment and with respect to enhancing sustainable urban development, Estonia has made some progress, in particular by adopting a number of legal acts (conditions for granting aid), strategies and action plans for the 2014-2020 period. Implementation of the new activities has not fully taken off yet.

Measures for fostering economic development and entrepreneurship in regions are based on the objectives set in the regional development strategy for the years 2014-2020. The strategy is guided by the principle that regional policy must not be aimed at merely helping regions that lag behind, but at satisfying the particular development needs of all Estonian regions and at

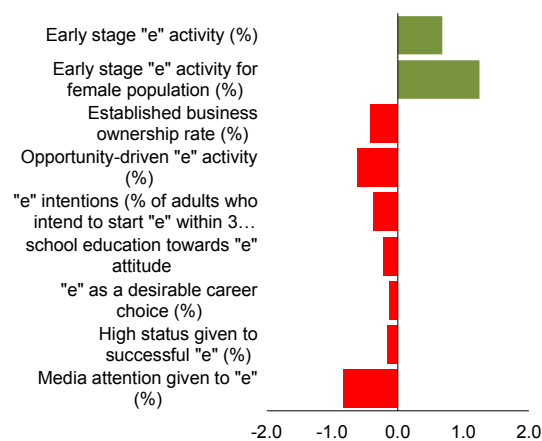
more efficiently exploiting their development potential.

Business environment

According to the Small Business Act Fact Sheet 2015, Estonia scored close to the EU average for entrepreneurship, but did not do as well as in previous years (see Graph 3.5.2). Opportunity-driven entrepreneurial activity was still low and entrepreneurial intentions remained below the EU average. Positive developments have been noticed in 2015. The recently published data by the Global Entrepreneurship Monitor⁽⁴⁸⁾ show significant improvement in total early-stage entrepreneurial activity and in established business ownership even it seems to be still lower than in Latvia (see Graph 3.5.3). Societal Values of Entrepreneurship (entrepreneurship as a good career choice, high status given to successful entrepreneurs, media attention) remain the areas with larger scope for improvement. The degree to which school education helps to develop entrepreneurial attitudes is enhancing, but there are still problems linked to the lack of teaching materials, methodological guidelines for teachers, and more theoretical than practical teaching.

⁽⁴⁸⁾ <http://www.gemconsortium.org/report>.

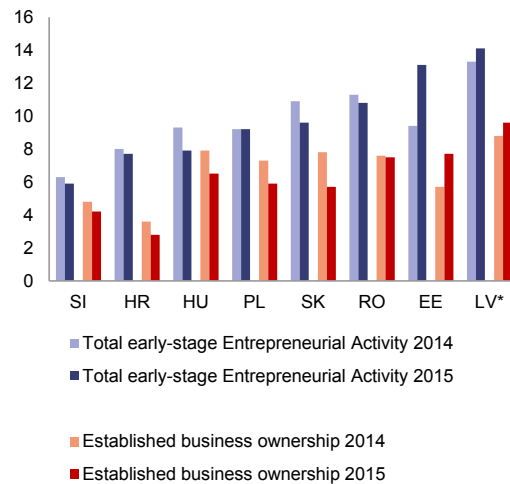
Graph 3.5.2: Entrepreneurship indicators ("e" indicators): variation from the EU average (measured in standard deviations, EU average=0)



Source: 2015 SBA Fact Sheet

Under the planned public administration reform, local authorities will be entrusted with additional responsibilities, including the development of local entrepreneurship. Local support for entrepreneurs is provided by the county development centres. They act as partners for Enterprise Estonia, providing advisory services to entrepreneurs, non-profit associations and local governments, and information on support programmes to applicants. In cooperation with other relevant local and regional organisations, the county development centres have drawn up coordinated plans to improve employment and entrepreneurial activity in the region, based on the region's potential and needs. The plans combine existing interventions with proposals for the new region-specific mechanisms that will be co-financed from the EU funds.

Graph 3.5.3: Total early-stage entrepreneurial activity (1) and established business ownership (2)



(1) Those who are either a nascent entrepreneur or owner-manager of a new business - In % of total entrepreneurial 18-64 population.

(2) Those who are currently an owner-manager of an established business, i.e., owning and managing a running business that has paid salaries, wages, or any other payments to the owners for more than 42 months - In % of total entrepreneurial 18-64 population.

Source: Global entrepreneurship Monitor - 2015/16 Global Report

Estonian companies are benefiting from a favourable business environment and well developed e-government. The country is relatively well-positioned among Member States with regard to the regulatory quality and government effectiveness index — in 8th and 14th place respectively. In the World Bank Doing Business 2016 Report, Estonia ranks 16th out of 189 economies. The country's weakest results are for protecting minority investors (81st) and resolving insolvency (40th). One of the areas in which the country is performing below the EU average, mainly due to the long insolvency procedures, is in giving a 'second chance' to entrepreneurs who have gone bankrupt. Revision of the insolvency framework is envisaged through a project to further improve the business environment launched by the Ministry of Justice in 2015. Another initiative to reduce administrative burdens, 'zero bureaucracy', started in the summer of 2015. It is led by the Ministry of Economic Affairs and Communications in cooperation with business organisation. Apart from long insolvency procedures, another factor that may contribute to weakening the business environment is the current

lack of national rules or procedures on cross-border transfers ⁽⁴⁹⁾.

In an overall assessment of performance in digitisation of the economy, Estonia performs above the EU average. However, it outperforms most of the other Member States and is seventh in the EU under the Digital Economy and Society Index 2016. It is also at the forefront of the supply and use of digital public services. Fixed broadband is available to 89 % of households, which puts Estonia 25th among the Member States; in contrast, Estonia ranks fourth in take-up of mobile broadband.

Public procurement

Estonia has a generally well-functioning and modern public procurement system with competent institutions, training and guidance, but the country lags behind on quality. The number of public procurement contracts carried out in Estonia in 2012 was about 9 000, with a total value of close to EUR 1.6 billion, which represents 12 % of GDP. However, most of the contracts in 2015 (78 %) are awarded on the basis of only one criterion — the lowest price. This limits the development of various policy options — e.g. green, social or innovative public procurement. In this context, the Ministry of Economic Affairs and Communications, the Ministry of Finance, and Enterprise Estonia have recently launched an initiative to promote innovation in public procurement (see section 3.3).

⁽⁴⁹⁾ Direct cross-border transfers from a registered office (of Estonian companies abroad or of foreign companies in Estonia) are not allowed under Estonian national legislation, except for European Companies (SEs), making it more difficult for companies to relocate and therefore to better seize business opportunities. See the 2013 study on the application of the Cross-Border Mergers Directive. ([http://www.europarl.europa.eu/RegData/etudes/etudes/join/2013/494460/IPOL-JOIN_ET\(2013\)494460_EN.pdf](http://www.europarl.europa.eu/RegData/etudes/etudes/join/2013/494460/IPOL-JOIN_ET(2013)494460_EN.pdf)).

ANNEX A

Overview table

Commitments

Summary assessment⁽⁵⁰⁾

2015 Country-specific recommendations (CSRs)	
CSR1: Avoid deviating from the medium-term budgetary objective in 2015 and 2016.	CSRs related to compliance with the Stability and Growth Pact will be assessed in spring once the final data will be available.
CSR2: Improve labour market participation, including by implementing the Work Ability reform. Improve incentives to work through measures targeting low-income earners. Take action to narrow the gender pay gap. Ensure high-quality social services and availability of childcare services at local level.	<p>Estonia has made some progress in addressing CSR 2:</p> <p>Some progress in improving labour market participation, including by implementing the Work Ability Reform as the Work Ability reform was enforced from January 1st, 2016 by providing active labour market services. With the entry into force of the Work Ability Allowance Act from July 1st assessment according to the new methodology will start and work ability allowances paid out. However, the new system will be fully operational only from January 2017 when the re-assessments start.</p> <p>Some progress in improving incentives to work for low-income earners, as Estonia has adopted a series of measures increasing the minimum wage and reducing labour taxation. However, overall, the tax measures adopted appear to act only on a relatively narrow range of incomes and their positive impact is expected to fade out relatively soon in a context of still relatively rapid wage increases. Finally, the tax refund for low-income earners gives rise to rather high effective marginal tax rates for incomes between EUR 480 and EUR 649 per month and risks providing disincentives in this part of the income distribution.</p> <p>Limited progress in reducing the gender pay gap. The Estonian government is planning some actions in 2016 to address the gender pay gap, through a legislative change of the Gender Equality Act and implementation of the Welfare Plan. A legislative proposal is planned for May 2016 to mandate labour inspectors the right to observe the implementation of the principle of equal pay by employers. Policy proposals are also planned on</p>

⁽⁵⁰⁾ The following categories are used to assess progress in implementing the 2015 CSRs:

No progress: The Member State (MS) has neither announced nor adopted measures to address the CSR. This category also applies if the MS has commissioned a study group to evaluate possible measures.

Limited progress: The MS has announced some measures to address the CSR, but these appear insufficient and/or their adoption/implementation is at risk.

Some progress: The MS has announced or adopted measures to address the CSR. These are promising, but not all of them have been implemented and it is not certain that all will be.

Substantial progress: The MS has adopted measures, most of which have been implemented. They go a long way towards addressing the CSR.

Fully implemented: The MS has adopted and implemented measures that address the CSR appropriately.

	<p>making the current parental leave system more flexible. The draft Welfare Plan 2016-2023, to be adopted in March 2016, encompasses strategic aims for employment, social protection, gender equality and equal treatment policies. These measures have been announced but remain to be implemented.</p> <p>Some progress in ensuring high-quality social services at local level, as amendments have been made to the Social Welfare Act and minimum requirements for nine social services entered into force on 1 January 2016. However, the actual impact of these measures depends on the level of cooperation between the local authorities and on the overall local government reform.</p> <p>Some progress in the availability of childcare services, as the trend of meeting the need is clearly improving, with additional places being created each year with the help of the European Structural and Investment Funds.</p>
<p>CSR3: Increase participation in vocational education and training, and its labour market relevance, in particular by improving the availability of apprenticeships. Focus public support for research and innovation on a coordinated implementation of the limited number of smart specialisation areas.</p>	<p>Estonia has made some progress in addressing CSR 3:</p> <p>Some progress in increasing participation in vocational education and training, and its labour market relevance, in particular by improving the availability of apprenticeships. Cooperation with social partners on VET and the provision of apprenticeships are picking up with the implementation of the thematic programme on VET, although dropout rates remain high.</p> <p>Some progress in focusing public support for research and innovation on coordinated implementation of a limited number of smart specialisation areas. Estonia has put on place its smart specialisation framework, taking measures to implement its research, development and innovation strategy 'Knowledge-based Estonia' and its Entrepreneurship Growth Strategy. A steering committee worked to ensure synergies in implementation, involving the two main ministries, industry and academia. However, although the Estonian Development Fund monitored progress in the analysis of growth areas, it reported no outputs in 2015. Institutional coordination of implementation needs to be reinforced.</p>

Europe 2020 (national targets and progress)	
Employment rate target set in the 2013 NRP: 76 %	<p>The Estonian national target for employment (20-64 age group) is set at 76 %, which means bringing an additional 38 000 persons into employment compared to 2009. As the employment rate is still rising, and stood at 76,5 % in 2015 Q1-3, this national target appears almost achieved, partly assisted by the 'denominator effect' of a shrinking working age population.</p> <p>Employment rate (%):</p> <p>2013: 73.3 %</p> <p>2014: 74.3 %</p> <p>2015Q1-3: 76.5%</p>
R&D target set in the 2013 NRP: 3% of GDP, of which 2% for the private sector.	<p>In 2014, R&D investment in Estonia fell further below the EU average of 2 % of GDP. While public R&D investment fell only slightly from 0.89 % of GDP for 2013 to 0.86 % for 2014, business R&D investment continued its sharply declining trend from 1.2 % of GDP in 2012 to 0.64 % in 2014 (see Graph 3.3.1).</p> <p>Estonia is moving away from reaching its national Europe 2020 R&D target and needs to step up efforts to tackle the lack of skilled personnel hindering growth and the low science-business cooperation hampering the translation of R&D into market results.</p>
Greenhouse gas emissions, base year 1990: +11% in 2020 compared to 2005 (in non-ETS sectors)	<p>2020 target: +11%</p> <p>According to the latest national projections and taking into account existing measures, the target is expected to be achieved: -2 % in 2020 compared to 2005 (with a margin of 13 percentage points).</p> <p>Non-ETS 2014 target: +8%.</p> <p>According to approximated data for 2014, greenhouse gas emissions from sectors not covered by the emissions trading scheme fell by 5 % between 2005 and 2014.</p>

<p>Renewable energy target set in the 2013 NRP: 25%</p> <p>Share of renewable energy in all modes of transport: 10%</p>	<p>With a renewable energy share of 26.5 % in 2014, Estonia is already above its 25 % target for 2020. However, it is far from reaching the binding 10 % renewable energy target for transport. The renewable energy share for transport was 0.2 % in 2014 and there has been no progress since the Renewable Energy Directive was adopted in 2009. Estonia has been holding negotiations with other Member States on sharing its excess renewables production (up to 2020) in the ‘cooperation mechanisms’ for renewable energy. The Commission strongly encourages this initiative and hopes that it will result in the relevant cooperation agreements being signed.</p>
<p>Energy efficiency: reduction of energy consumption by 6.5 Mtoe expressed in primary energy consumption (2.8 Mtoe expressed in final energy consumption).</p>	<p>Additional actions are required to ensure that the target is met, including in buildings and the transport sector, since if the trends in final energy consumption in 2005-2013 continue, the target is at risk of being missed. Primary energy intensity in Estonia increased from 2005 and remains significantly above the EU average. Nevertheless, the industrial sector has seen a steep reduction in energy intensity, of around 24 % between 2005 and 2013, significantly more than the EU average.</p>
<p>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.</p>	<p>The EU 2020 target is 10 %. In 2014, the rate was 11.4 %.</p> <p>The early school leaving rate was 17.3 % in rural areas and 15.2 % in towns and suburbs, as compared with 4.7 % in cities, and the rate for males (15.3 %) was still more than twice the rate for females (7.5 %) (2014 Eurostat data).</p>
<p>Tertiary education target: 40% of those aged 30-34 having successfully completed tertiary education</p>	<p>In 2014 the completion rate was 43.2 %. However, there is a significant gender gap (54.2 % for women compared with 32.8 % for men). Students in science, technology and mathematics subjects represented 28.9 % of all higher education students in 2014.</p>

<p>Target for the reduction of population at risk of poverty: 15% in 2020</p>	<p>A reduction in the at-risk-of-poverty rate from 17.5 % in 2010 (income year) to 15 % in 2020 (income year) would equate to a 36 248 fall in the number of people at risk of poverty in absolute terms.</p> <p>The number of people at risk of poverty in 2013 increased due mainly to the increase in households' disposable median income, thereby moving the country further away from its national poverty reduction target of 15 %.</p> <p>At-risk-of-poverty rate (survey year):</p> <p>2012: 17.5 %</p> <p>2013: 18.6 %</p> <p>2014: 21.8 %</p>
---	--

See additional contextual indicators at: <http://ec.europa.eu/education/monitor>.

See additional contextual indicators at: <http://ec.europa.eu/education/monitor>

ANNEX B

MIP scoreboard

Table B.1: The MIP scoreboard for Estonia

			Thresholds	2009	2010	2011	2012	2013	2014
External imbalances and competitiveness	Current account balance, (% of GDP)	3 year average	-4%/6%	-7.1	-1.5	1.9	0.2	-0.4	-0.5
	Net international investment position (% of GDP)		-35%	-80.1	-71.2	-55.6	-52.0	-47.6	-43.6
	Real effective exchange rate - 42 trading partners, HICP deflator	3 years % change	±5% & ±11%	13.6	4.6	-0.8	-3.6	3.1	4.7
	Export market share - % of world exports	5 years % change	-6%	16.3	9.3	24.8	8.5	14.5	24.5
	Nominal unit labour cost index (2010=100)	3 years % change	9% & 12%	39.2	13.6	-2.8	-1.8	8.8	13.0
Internal imbalances	Deflated house prices (% y-o-y change)		6%	-37.0	2.1	2.6	3.8	7.3	12.8
	Private sector credit flow as % of GDP, consolidated		14%	-6.0	-7.6	-0.7	10.6	4.2	6.4
	Private sector debt as % of GDP, consolidated		133%	153.2	140.4	122.9	123.2	115.8	116.1
	General government sector debt as % of GDP		60%	7.0	6.6	5.9	9.5	9.9	10.4
	Unemployment rate	3 year average	10%	7.9	11.9	14.2	13.0	10.3	8.7
	Total financial sector liabilities (% y-o-y change)		16.5%	-7.8	-8.9	1.0	11.9	2.9	12.2
New employment indicators	Activity rate - % of total population aged 15-64 (3 years change in p.p)		-0.2%	1.2	0.7	0.5	0.8	1.2	0.5
	Long-term unemployment rate - % of active population aged 15-74 (3 years change in p.p)		0.5%	0.8	5.3	5.4	1.8	-3.8	-3.8
	Youth unemployment rate - % of active population aged 15-24 (3 years change in p.p)		2%	15.3	22.8	10.4	-6.5	-14.2	-7.4

p: provisional.

Figures highlighted are those falling outside the threshold established in the European Commission's Alert Mechanism Report. For REER and ULC, the first threshold applies to euro area Member States.

Source: European Commission

ANNEX C

Standard tables

Table C.1: Financial market indicators

	2010	2011	2012	2013	2014	2015
Total assets of the banking sector (% of GDP)	138.2	114.1	109.2	104.9	107.5	113.1
Share of assets of the five largest banks (% of total assets)	92.3	90.6	89.6	89.7	89.9	-
Foreign ownership of banking system (% of total assets)	94.5	89.2	34.3	33.3	32.0	-
Financial soundness indicators:						
- non-performing loans (% of total loans) ¹⁾	5.4	4.0	2.6	1.5	1.4	1.3
- capital adequacy ratio (% ¹⁾)	22.1	18.6	19.3	20.0	35.7	27.6
- return on equity (% ¹⁾)	2.1	33.3	14.2	17.1	12.2	28.9
Bank loans to the private sector (year-on-year % change)	-4.4	-3.5	-0.4	2.7	4.5	9.3
Lending for house purchase (year-on-year % change)	-2.1	-1.5	0.2	1.2	2.9	4.5
Loan to deposit ratio	162.8	144.5	134.4	128.9	124.0	122.1
Central Bank liquidity as % of liabilities	0.4	0.1	0.3	0.2	0.3	0.4
Private debt (% of GDP)	140.4	122.9	123.2	115.8	116.1	
Gross external debt (% of GDP) ²⁾ - public	5.2	3.1	7.0	7.6	7.9	7.5
- private	47.4	46.0	49.2	47.2	48.8	47.5
Long-term interest rate spread versus Bund (basis points)*	-	-	-	-	-	-
Credit default swap spreads for sovereign securities (5-year)*	107.4	102.4	101.3	58.6	57.1	58.3

1) Latest data Q3 2015.

2) Latest data September 2015. Monetary authorities, monetary and financial institutions are not included.

* Measured in basis points.

Source: IMF (financial soundness indicators); European Commission (long-term interest rates); World Bank (gross external debt); Eurostat (private debt); ECB (all other indicators).

Table C.2: Labour market and social indicators

	2010	2011	2012	2013	2014	2015 ⁽⁴⁾
Employment rate (% of population aged 20-64)	66.8	70.6	72.2	73.3	74.3	76.5
Employment growth (% change from previous year)	-5.0	6.5	1.7	1.2	0.8	3.4
Employment rate of women (% of female population aged 20-64)	65.9	67.8	69.4	70.1	70.6	72.5
Employment rate of men (% of male population aged 20-64)	67.8	73.5	75.1	76.7	78.3	80.5
Employment rate of older workers (% of population aged 55-64)	53.8	57.5	60.5	62.6	64.0	64.3
Part-time employment (% of total employment, aged 15 years and over)	11.1	10.8	10.5	10.2	9.6	10.7
Fixed term employment (% of employees with a fixed term contract, aged 15 years and over)	3.7	4.5	3.7	3.5	3.2	3.5
Transitions from temporary to permanent employment	17.2	60.5	63.4	65.0	59.1	-
Unemployment rate ⁽¹⁾ (% active population, age group 15-74)	16.7	12.3	10.0	8.6	7.4	6.1
Long-term unemployment rate ⁽²⁾ (% of labour force)	7.6	7.1	5.5	3.8	3.3	2.5
Youth unemployment rate (% active population aged 15-24)	32.9	22.4	20.9	18.7	15.0	12.3
Youth NEET ⁽³⁾ rate (% of population aged 15-24)	14.0	11.6	12.2	11.3	11.7	-
Early leavers from education and training (% of pop. aged 18-24 with at most lower sec. educ. and not in further education or training)	11.0	10.6	10.3	9.7	11.4	-
Tertiary educational attainment (% of population aged 30-34 having successfully completed tertiary education)	40.2	40.2	39.5	42.5	43.2	-
Formal childcare (30 hours or over; % of population aged less than 3 years)	19.0	15.0	14.0	18.0	-	-

(1) 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.

(2) Long-term unemployed are peoples who have been unemployed for at least 12 months.

(3) Not in education employment or training.

(4) Average of first three quarters of 2015. Data for total unemployment and youth unemployment rates are seasonally adjusted.

Source: European Commission (EU Labour Force Survey)

Table C.3: Labour market and social indicators (continued) (*)

Expenditure on social protection benefits (% of GDP)	2009	2010	2011	2012	2013	2014
Sickness/healthcare	5.3	4.7	4.3	4.2	4.1	-
Invalidity	1.8	1.9	1.8	1.7	1.8	-
Old age and survivors	7.9	7.7	6.8	6.6	6.5	-
Family/children	2.2	2.2	1.9	1.7	1.6	-
Unemployment	1.2	0.7	0.5	0.5	0.5	-
Housing and social exclusion n.e.c.	0.0	0.0	0.0	0.0	0.0	-
Total	18.6	17.4	15.5	14.8	14.6	-
of which: means-tested benefits	0.1	0.1	0.2	0.1	0.1	-
Social inclusion indicators	2009	2010	2011	2012	2013	2014
People at risk of poverty or social exclusion ⁽¹⁾ (% of total population)	23.4	21.7	23.1	23.4	23.5	26.0
Children at risk of poverty or social exclusion (% of people aged 0-17)	24.5	24.0	24.8	22.4	22.3	23.8
At-risk-of-poverty rate ⁽²⁾ (% of total population)	19.7	15.8	17.5	17.5	18.6	21.8
Severe material deprivation rate ⁽³⁾ (% of total population)	6.2	9.0	8.7	9.4	7.6	6.2
Proportion of people living in low work intensity households ⁽⁴⁾ (% of people aged 0-59)	5.6	9.0	10.0	9.1	8.4	7.6
In-work at-risk-of-poverty rate (% of persons employed)	8.1	6.5	7.9	8.3	7.6	11.8
Impact of social transfers (excluding pensions) on reducing poverty	23.9	36.5	29.7	29.4	26.8	23.2
Poverty thresholds, expressed in national currency at constant prices ⁽⁵⁾	3155	2905	2764	2812	2966	3151
Gross disposable income (households; growth %)	-9.1	-1.3	9.1	3.6	9.5	2.8
Inequality of income distribution (S80/S20 income quintile share ratio)	5.0	5.0	5.3	5.4	5.5	6.5

(*) Structural data break: Statistics Estonia has changed its data source in 2013 for calculating poverty rates.

(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) At-risk-of-poverty rate (AROP): proportion of people with an equivalised disposable income below 60 % of the national equivalised median income.

(3) 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.

(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) For EE, CY, MT, SI and SK, thresholds in nominal values in euros; harmonised index of consumer prices (HICP) = 100 in 2006 (2007 survey refers to 2006 incomes)

Source: For expenditure for social protection benefits ESSPROS; for social inclusion EU-SILC

Table C.4: Structural policy and business environment indicators

Performance indicators	2009	2010	2011	2012	2013	2014
Labour productivity (real, per person employed, y-o-y)						
Labour productivity in industry	4.55	12.60	-1.81	5.84	8.08	5.77
Labour productivity in construction	4.76	23.68	-5.68	5.94	-5.71	-6.44
Labour productivity in market services	-2.93	5.11	-1.03	7.57	-0.06	2.65
Unit labour costs (ULC) (whole economy, y-o-y)						
ULC in industry	1.75	-12.63	-0.67	7.54	-3.36	5.35
ULC in construction	4.24	-6.98	-11.16	-5.61	17.76	9.80
ULC in market services	4.56	-5.54	0.18	4.53	5.13	1.61
Business environment	2009	2010	2011	2012	2013	2014
Time needed to enforce contracts ⁽¹⁾ (days)	425	425	425	425	425	425
Time needed to start a business ⁽¹⁾ (days)	6.5	6.5	6.5	6.5	6.5	6.5
Outcome of applications by SMEs for bank loans ⁽²⁾	0.95	na	0.89	na	0.91	0.66
Research and innovation	2009	2010	2011	2012	2013	2014
R&D intensity	1.40	1.58	2.34	2.16	1.74	1.46
Total public expenditure on education as % of GDP, for all levels of education combined	6.03	5.66	5.16	4.82	na	na
Number of science & technology people employed as % of total employment	49	50	50	51	51	51
Population having completed tertiary education ⁽³⁾	30	30	31	32	32	33
Young people with upper secondary level education ⁽⁴⁾	83	84	83	81	84	84
Trade balance of high technology products as % of GDP	-1.21	-1.58	-0.67	-0.88	-0.19	-0.30
Product and service markets and competition				2003	2008	2013
OECD product market regulation (PMR) ⁽⁵⁾ , overall				na	1.37	1.29
OECD PMR ⁽⁵⁾ , retail				na	1.40	1.50
OECD PMR ⁽⁵⁾ , professional services				na	1.81	1.79
OECD PMR ⁽⁵⁾ , 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 answer 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.5: Green growth

Green growth performance		2009	2010	2011	2012	2013	2014
Macroeconomic							
Energy intensity	kgoe / €	0.49	0.55	0.51	0.48	0.51	-
Carbon intensity	kg / €	1.50	1.80	1.72	1.55	1.71	-
Resource intensity (reciprocal of resource productivity)	kg / €	3.05	3.02	2.97	3.08	3.20	3.15
Waste intensity	kg / €	-	1.72	-	1.76	-	-
Energy balance of trade	% GDP	-2.2	-1.5	-0.4	-1.3	-2.2	-2.0
Weighting of energy in HICP	%	12.66	13.26	13.93	14.69	14.42	14.43
Difference between energy price change and inflation	%	3.7	3.9	1.3	7.2	7.4	-4.6
Real unit of energy cost	% of value added	14.6	14.6	14.6	-	-	-
Ratio of labour taxes to environmental taxes	ratio	6.2	6.1	6.0	5.9	6.3	6.1
Environmental taxes	% GDP	2.9	2.9	2.7	2.7	2.5	2.7
Sectoral							
Industry energy intensity	kgoe / €	0.29	0.26	0.25	0.23	0.25	-
Real unit energy cost for manufacturing industry	% of value added	16.2	16.2	16.2	-	-	-
Share of energy-intensive industries in the economy	% GDP	10.74	12.19	12.21	11.36	12.27	12.72
Electricity prices for medium-sized industrial users	€/ kWh	0.06	0.07	0.07	0.08	0.10	0.09
Gas prices for medium-sized industrial users	€/ kWh	0.03	0.03	0.03	0.04	0.04	0.04
Public R&D for energy	% GDP	0.02	0.02	0.02	0.02	0.01	0.01
Public R&D for environment	% GDP	0.03	0.07	0.05	0.03	0.04	0.04
Municipal waste recycling rate	%	21.2	18.2	26.3	44.2	72.8	-
Share of GHG emissions covered by ETS*	%	64.1	73.0	72.3	70.6	73.2	73.0
Transport energy intensity	kgoe / €	1.01	1.01	0.95	0.88	0.89	-
Transport carbon intensity	kg / €	2.91	2.90	2.77	2.57	2.62	-
Security of energy supply							
Energy import dependency	%	22.0	13.6	12.0	17.0	11.9	-
Aggregated supplier concentration index	HHI	19.2	108.3	74.7	116.1	73.0	-
Diversification of energy mix	HHI	0.39	0.47	0.49	0.45	0.48	-

All macro intensity indicators are expressed as a ratio of a physical quantity to GDP (in 2005 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 a percentage of total value added for the economy

Environmental taxes and labour taxes: from European Commission, 'Taxation trends in the European Union'

Industry energy intensity: final energy consumption of industry (in kgoe) divided by gross value added of industry (in 2005 EUR)

Real unit energy costs for manufacturing industry: real costs as a percentage 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 500–20 000 MWh and 10 000–100 000 GJ; figures excl. VAT.

Municipal waste recycling rate: ratio of recycled municipal waste to total municipal waste

Public R&D for energy or for the environment: government spending on R&D (GBAORD) for these categories as % of GDP

Proportion of greenhouse gas (GHG) emissions covered by EU Emission Trading System (ETS): based on greenhouse gas 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 2005 EUR)

Transport carbon intensity: greenhouse gas 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 over natural gas, total petrol products, nuclear heat, renewable energies and solid fuels. * European Commission and European Environment Agency

Source: European Commission (Eurostat) unless indicated otherwise