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Reviving productive investment in Estonia

Caroline Klein,
Olena Havrylchyk,
Lorenzo Casullo

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ABSTRACT/RÉSUMÉ

Reviving productive investment in Estonia

Since the crisis, Estonia has experienced one of the most pronounced declines in the ratio of non-residential investment to GDP in the OECD. In addition, investment in intangible capital has remained well below OECD standards, partly explaining the low innovative capacities of typical Estonian firms. Uncertainty created by regional geopolitical tensions has played a role but poor investment performance stems from domestic factors too, such as a normalisation after the boom years, the lack of adequate skills and insufficient incentives for risk-taking. Improving lifelong learning and maintaining skilled mothers in employment can contribute to reducing shortages in skills needed by investors. Restructuring of insolvent firms should be eased to increase credit recovery and redirect capital to the most productive ones. Developing alternatives to bank funding can support investment in small and innovative firms. While there is room to improve the quality of infrastructure further, selection and prioritisation of projects should improve. Incentives for green investment, in particular to reduce pollution emitted by the oil shale industry and to achieve energy efficiency gains, could be strengthened.

This Working Paper relates to the 2017 *OECD Economic Survey of Estonia* (www.oecd.org/eco/surveys/economic-survey-estonia.htm).

JEL classification: E22, G21, G23, G28, J24, O52, Q56.

Keywords: Estonia, investment, business environment, FDI, financing, Fintech, insolvency, infrastructure, intangible capital, green investment, skills.

Relancer l'investissement productif en Estonie

Depuis la crise, l'Estonie a enregistré l'un des reculs du rapport de l'investissement non résidentiel au PIB les plus marqués de toute la zone OCDE. De plus, l'investissement dans le capital immatériel reste bien inférieur aux normes de l'OCDE, expliquant en partie la faiblesse des capacités d'innovation des entreprises estoniennes en général. Les incertitudes engendrées par les tensions géopolitiques ont joué un rôle dans ce phénomène, mais le niveau modeste de l'investissement est également attribuable à des facteurs intérieurs comme la normalisation intervenue après les années d'expansion économique, le manque de qualifications adéquates et l'insuffisance des incitations à prendre des risques. Améliorer la formation continue et maintenir en emploi les mères de familles qualifiées peut contribuer à réduire le déficit de compétences recherchées par les investisseurs. La restructuration des entreprises insolvables devrait être facilitée pour accentuer la reprise du crédit et rediriger les capitaux en direction d'entreprises plus productives. Concevoir des solutions autres que le financement bancaire pourrait soutenir l'innovation dans les petites entreprises innovantes. Il est possible d'améliorer encore la qualité des infrastructures, mais les projets devraient être plus judicieusement choisis et les priorités en la matière mieux définies. Les incitations à l'investissement vert, en particulier pour réduire la pollution liée aux émissions de l'industrie des schistes bitumineux et améliorer l'efficacité énergétique, pourraient être renforcées.

Ce Document de travail se rapporte à l'Étude économique de l'OCDE de l'Estonie 2017 (www.oecd.org/fr/eco/etudes/etude-economique-estonie.htm).

Classification JEL: E22, G21, G23, G28, J24, O52, Q56.

Mots clefs: Estonie, investissement, environnement des affaires, IDE, financement, Fintech, insolvabilité, infrastructure, capital incorporel, investissement vert, compétences.

TABLE OF CONTENTS

Introduction 6
Moving towards more productive investment 7
Investment has weakened 7
Investment in intangible capital and R&D is relatively low 9
Low demand only partly explains investment weakness 11
Investment is likely to remain below pre-crisis levels 14
Improving investment conditions 15
Business environment is supportive and competitive 15
Addressing deficiencies in insolvency proceedings 17
Improving access to finance 19
Addressing skill shortages 23
Identifying skill needs and providing adequate career guidance 24
Raising the quality of lifelong learning 25
Removing barriers to female employment 26
Improving infrastructure investment 27
Addressing remaining bottlenecks in the transport sector 28
Improving management of infrastructure projects 29
Supporting green investment 31
Greening the electricity sector 32
Fostering the decarbonisation of transport 33
Increasing financial incentives for green investment 34
Improving effectiveness of public programmes 35
REFERENCES 37

Tables

1. Fintech providers of debt and equity funding in Estonia 22

Figures

1. Low investment has curbed growth 6
2. Investment has lost ground 7
3. Investment intensity has declined in most sectors 8
4. FDI inflows have dropped and are mostly reinvested earnings 9
5. Intellectual property products account for a small share of total investment 10
6. Fixed broadband penetration and ICT use could improve 10
7. Innovation capacity is low 11
8. Low demand and labour shortages are viewed as main obstacles to business growth 12
9. The GDP slowdown does not fully explain the recent drop in investment 13
10. Increasing savings have not been used to invest 14
11. Capital intensity remains well below the OECD average 15
12. The business environment is favourable 16
13. Credit recovery is low 17
14. The insolvency regime is inefficient 18
15. Firms mainly use internal funds to finance investment 19
16. A large share of firms does not apply for bank financing because of possible rejection 20
17. Estonia is a frontrunner in alternative finance but amounts are low 23
18. A large share of Estonians feels under-skilled 24

19. Parental leave is the lengthiest in the OECD 26
20. The quality of infrastructure is average 27
21. Investments in road and rail have been high 28
22. The quality of logistics infrastructure is poor 29
23. Freight flows have declined 30
24. The share of renewables in electricity is low 33

Boxes

Box 1. Fintech in Estonia 22
Box 2. Capacity utilisation in rail and ports 30
Box 3. Recommendations to revive productive investment 35

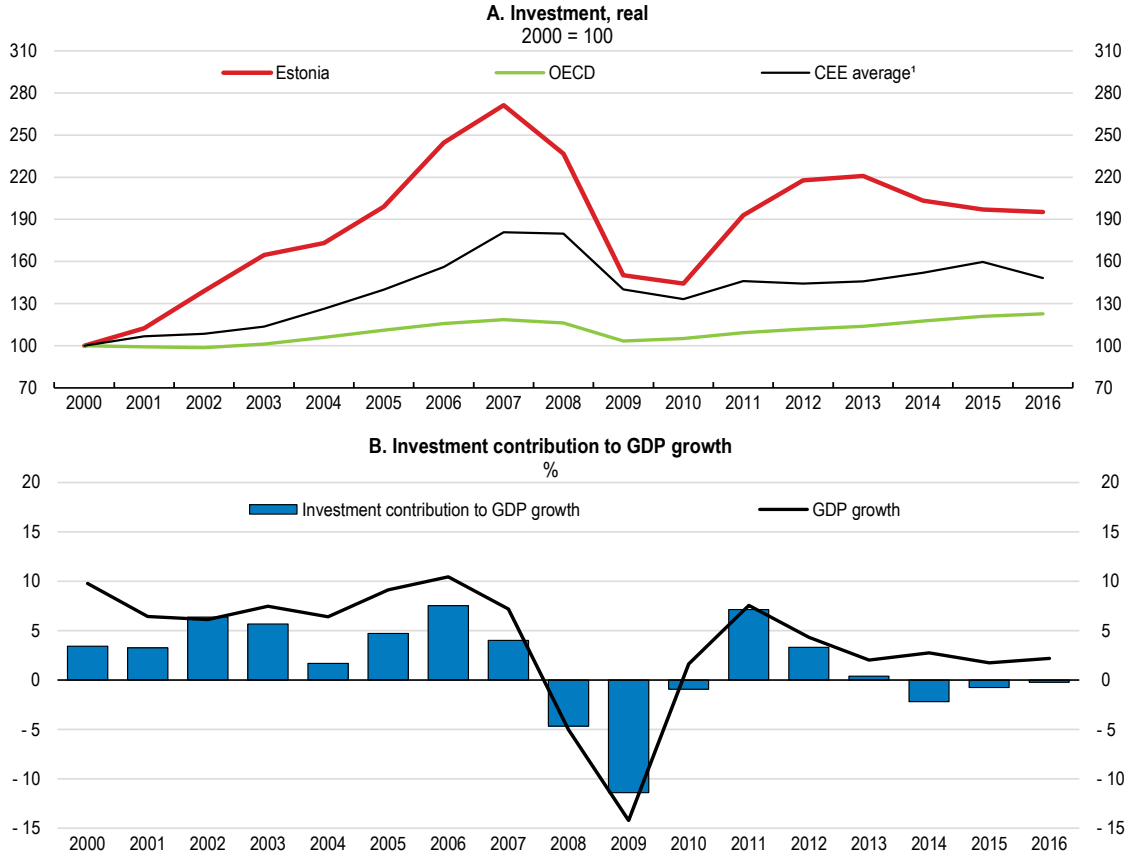
REVIVING PRODUCTIVE INVESTMENT IN ESTONIA

by Caroline Klein, Olena Havrylchyk and Lorenzo Casullo[1]

Introduction

Growth, stimulated by technological progress and innovation, requires productive investment, particularly in intangible capital. In Estonia, poor investment performance between 2013 and 2016 has weighed on growth (Figure 1, Panel A and B). The pace of capital accumulation and its contribution to labour productivity growth have halved between pre- and post-crisis years. Investment in intangible capital has remained well below OECD standards. Understanding the main drivers of investment deceleration over recent years and the barriers to intangible investment is central to identifying avenues for Estonia to seize future investment opportunities.

Figure 1. Low investment has curbed growth



1. Simple average of Czech Republic, Hungary, Latvia, Lithuania, Poland, Slovak Republic, and Slovenia.

Source: OECD Economic Outlook 101 database (updated with information available on 1 September 2017)

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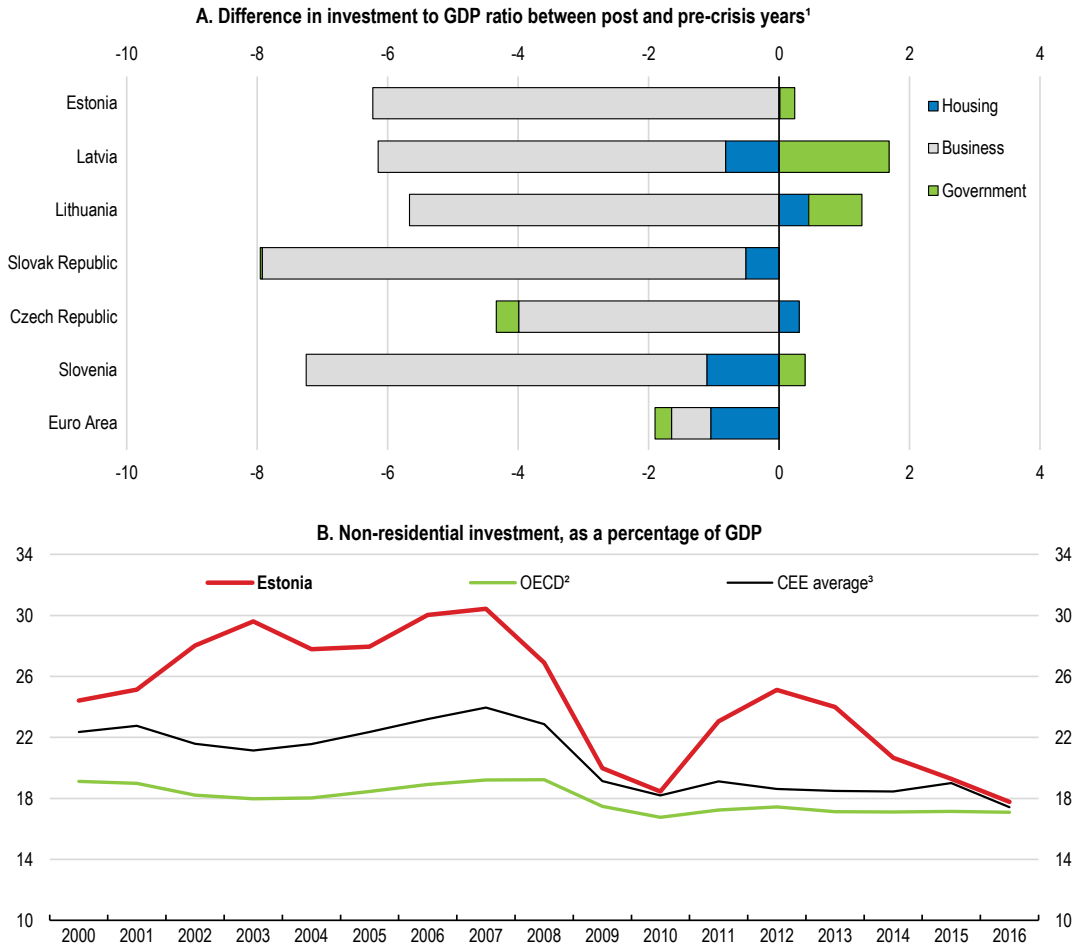
This working paper analyses the drivers of investment developments in Estonia, including investment in intangible capital and FDI. It then discusses how to improve framework conditions to support capital spending, with particular attention to access to finance and efficiency of the insolvency regime. Because investment in intangible capital relies on the availability of a skilled labour force, policy options to improve allocation and upskilling of labour resources are also examined. Finally, the paper discusses investment required for improving the quality of infrastructure and greening the economy.

Moving towards more productive investment

Investment has weakened

Growth has consistently disappointed over the past four years on the back of weaker-than-expected investment. Investment has declined in real terms between 2013 and 2016 (see Figure 1, Panel A), and investment intensity, measured by the investment to GDP ratio, has declined by 14 percentage points since the crisis. Although housing investment has recovered somewhat since 2010, supported by increasing household purchasing power, the non-residential investment to GDP ratio has reached a record low level in 2016. This weakness contrasts significantly with pre-crisis years and performance in the euro area, but less with those of peer countries (Figure 2, Panel A and B).

Figure 2. Investment has lost ground



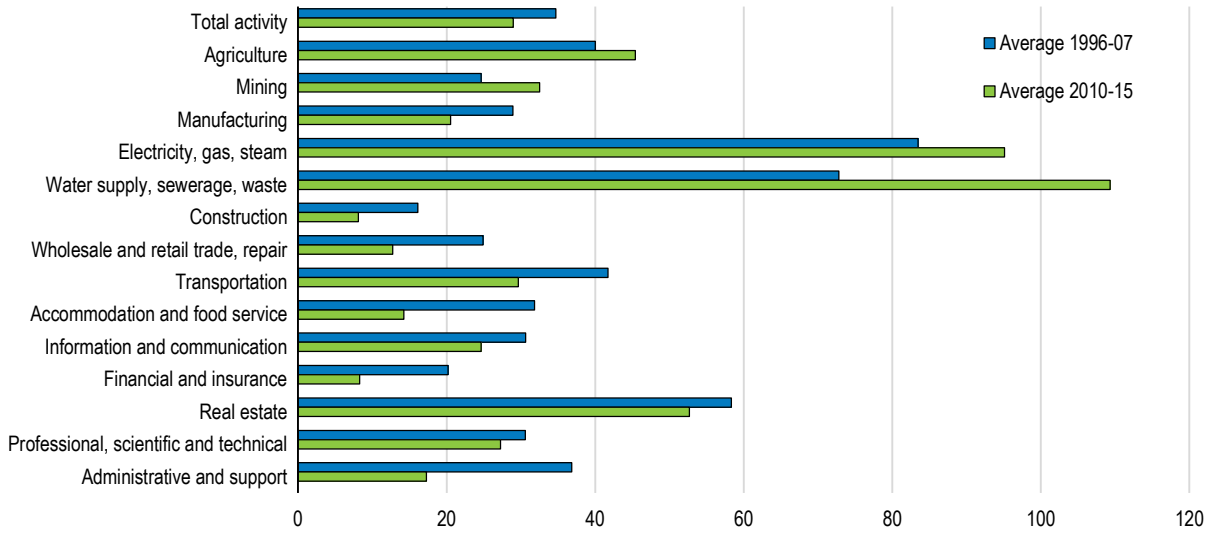
1. Average of investment share in GDP from 1996 to 2007 and from 2010 to 2016.
2. Unweighted average of OECD available countries.
3. Unweighted average of Czech Republic, Hungary, Latvia, Lithuania, Poland, Slovak Republic, and Slovenia.

Source: OECD Economic Outlook 101 Database (updated with information available on 1 September 2017).

Weakening has been more pronounced in the private sector, with public investment remaining relatively stable at around 5% of GDP, despite slower EU structural funds disbursement at the beginning of the new funding period (Figure 2, Panel A). In the private sector, while part of the decline relates to one-off investments in the energy sector between 2011 and 2013, investment has also been sluggish in manufacturing and transport, declining over recent years to stand well below pre-crisis levels (Figure 3).

Figure 3. Investment intensity has declined in most sectors

Gross fixed capital formation as a percentage of value added by activity

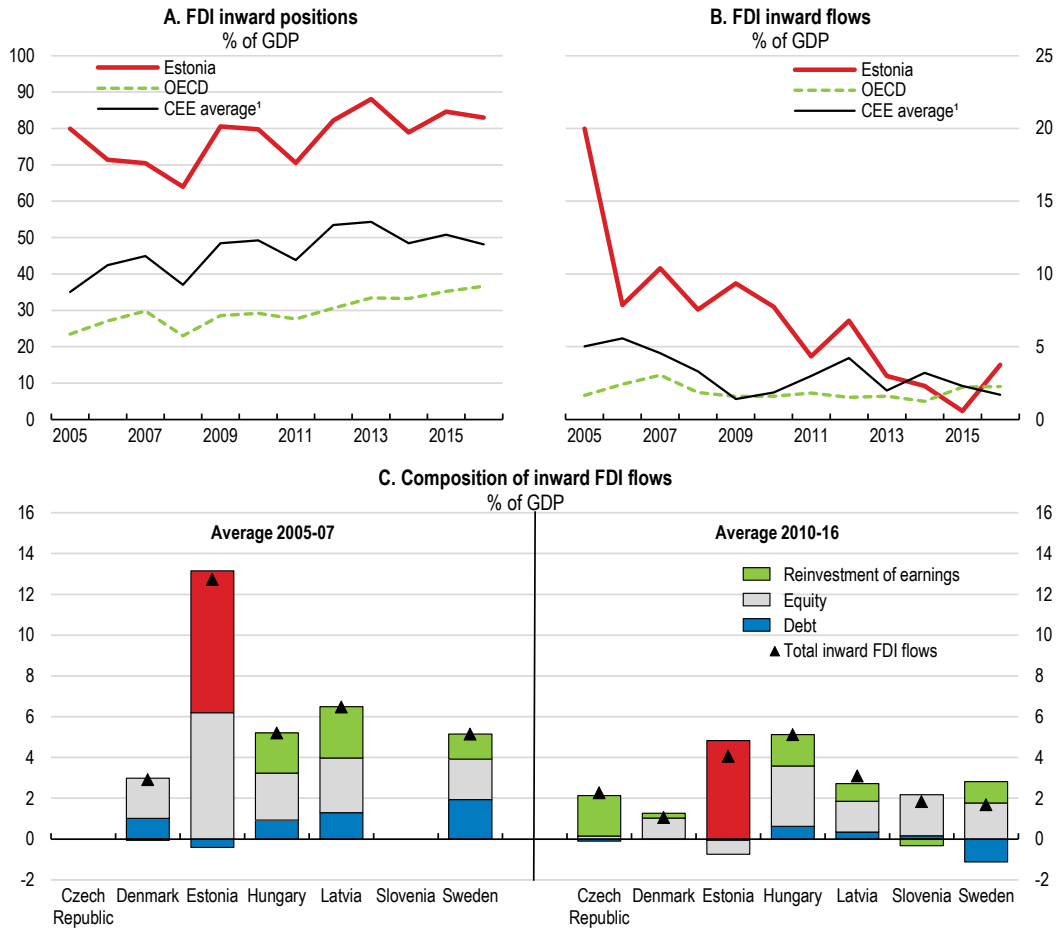


Source: OECD National Accounts Statistics.

Foreign direct investment (FDI) has declined as in most other CEE countries and remains modest in manufacturing industries. While inward FDI stock reached 83% of GDP in 2016, the highest level among peer economies, FDI inflows have decreased dramatically: from 10% to around 4% of GDP since 2007 (Figure 4, Panel A). Reinvestment of earnings accounted for the majority of inward FDI flows in recent years, while equity flows have dropped, reflecting the depletion of new investment projects (Figure 4, Panel B). This is worrisome, as FDI plays an important role in integration in global value chains and in international knowledge diffusion (Coe et al., 2008; Alfaro, 2016).

The decline in FDI has not affected all economic sectors. Inward FDI diminished in the financial sector, in some network industries, and in construction. By contrast, positive developments are observed in real estate and information and telecommunication. FDI in business R&D remains low, reaching only 0.06% of GDP in 2015 (European Commission, 2017).

Figure 4. FDI inflows have dropped and are mostly reinvested earnings



Note: FDI data are measured on a directional basis and are excluding resident SPEs (special purpose entities) when available.

1. Simple average of Czech Republic, Hungary, Latvia, Poland, Slovak Republic, and Slovenia.

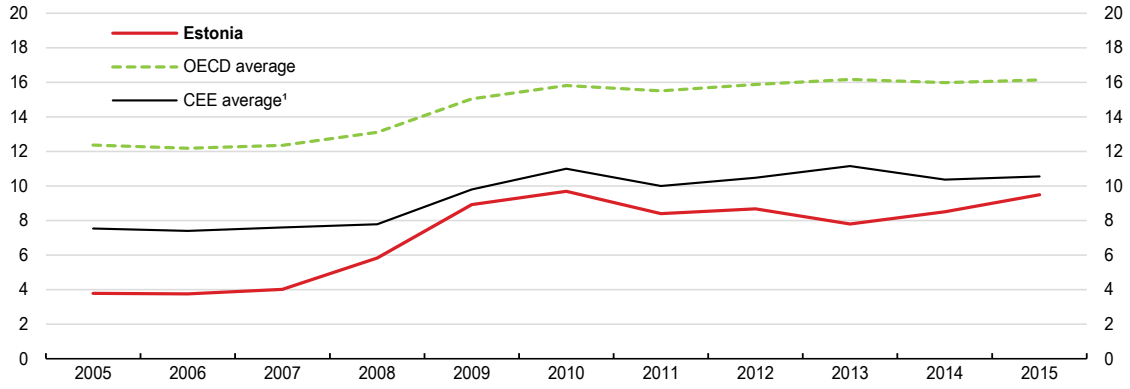
Source: OECD International Direct Investment Statistics database.

Investment in intangible capital and R&D is relatively low

Scope for increasing investment in knowledge-based capital is large, particularly in traditional sectors of the economy. Investment in intellectual property products is low by international standards, accounting for only 9% of total investment in 2015; around half of the OECD average (Figure 5). A large share of such investment can be imputed to the information and communication sector and public administration, while only 9% comes from the manufacturing sector. The share of intangible in total investment has increased in services but has remained weak in manufacturing over the past three years compared with pre-crisis levels. Total R&D spending as a percentage of GDP is 40% below the OCDE average, and a lower proportion of total spending is undertaken by businesses than in CEE peers.

Figure 5. Intellectual property products account for a small share of total investment

Investment in intellectual property products, % of total gross fixed capital formation

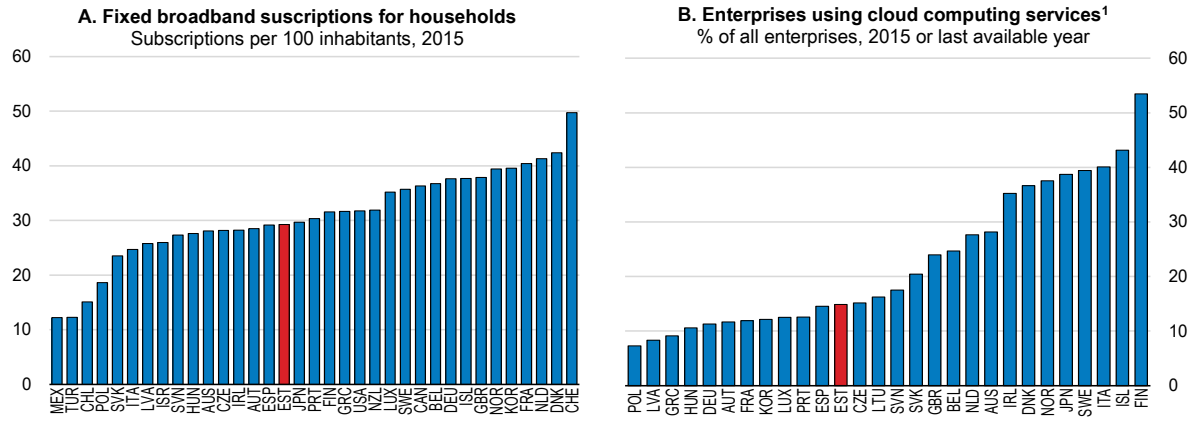


1. Simple average of Czech Republic, Hungary, Latvia, Lithuania, Poland, Slovak Republic, and Slovenia.

Source: OECD National Accounts database.

While Estonia is well advanced in the digitalisation of the economy, investment in software and databases and in ICT equipment does not account for a particularly large share of total investment by international standards. Estonia is one of the first countries to have implemented e-government and a relatively high share of its population has basic digital skills. Meanwhile, Estonian non-financial companies lag behind when it comes to ICT use, notably the share of enterprises whose business processes are automatically linked to those of their suppliers and/or customers, the share of enterprises' turnover on e-commerce, and the percentage of enterprises with broadband access (Figure 6). Estonia was ranked only 20th for the digitisation of its business sector in the EU's Digital Economy and Society Index 2017.

Figure 6. Fixed broadband penetration and ICT use could improve



1. Cloud computing refers to ICT services used over the Internet as a set of computing resources to access software, computing power, storage capacity and so on.

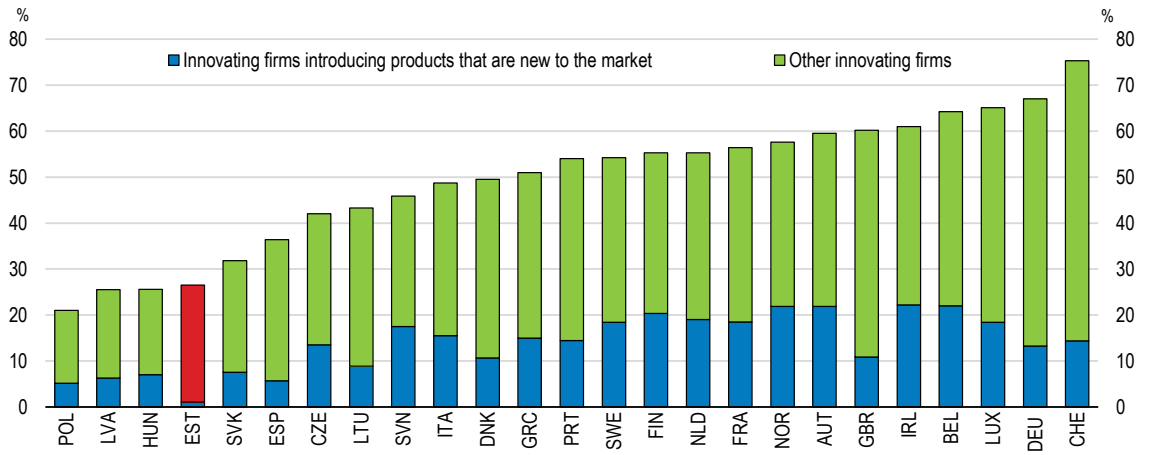
Source: OECD Broadband database; OECD ICT database.

Low intangible capital spending may partly explain Estonia's relatively low share of innovative firms (Figure 7). Recent empirical analyses highlight that investment in knowledge-based capital is an important driver of long-term productivity gains, and crucial for technological upgrading (Andrews and Criscuolo,

2013). The prevalence of SMEs in traditional sectors in the economy is a factor behind Estonia's low investment in intangible, as barriers to innovative investment are larger for small firms. Supporting the SME's capacity to adopt technologies should thus be a priority. As highlighted in OECD (2017d), current public support to innovative activities has not met business needs, especially in traditional sectors, calling for strengthening involvement of businesses in the design of innovation policies and cooperation between research institutions and firms.

Figure 7. Innovation capacity is low

Share of innovating firms in all firms surveyed, 2012-14



Note: International comparability may be limited due to differences in innovation survey methodologies and country-specific response patterns.

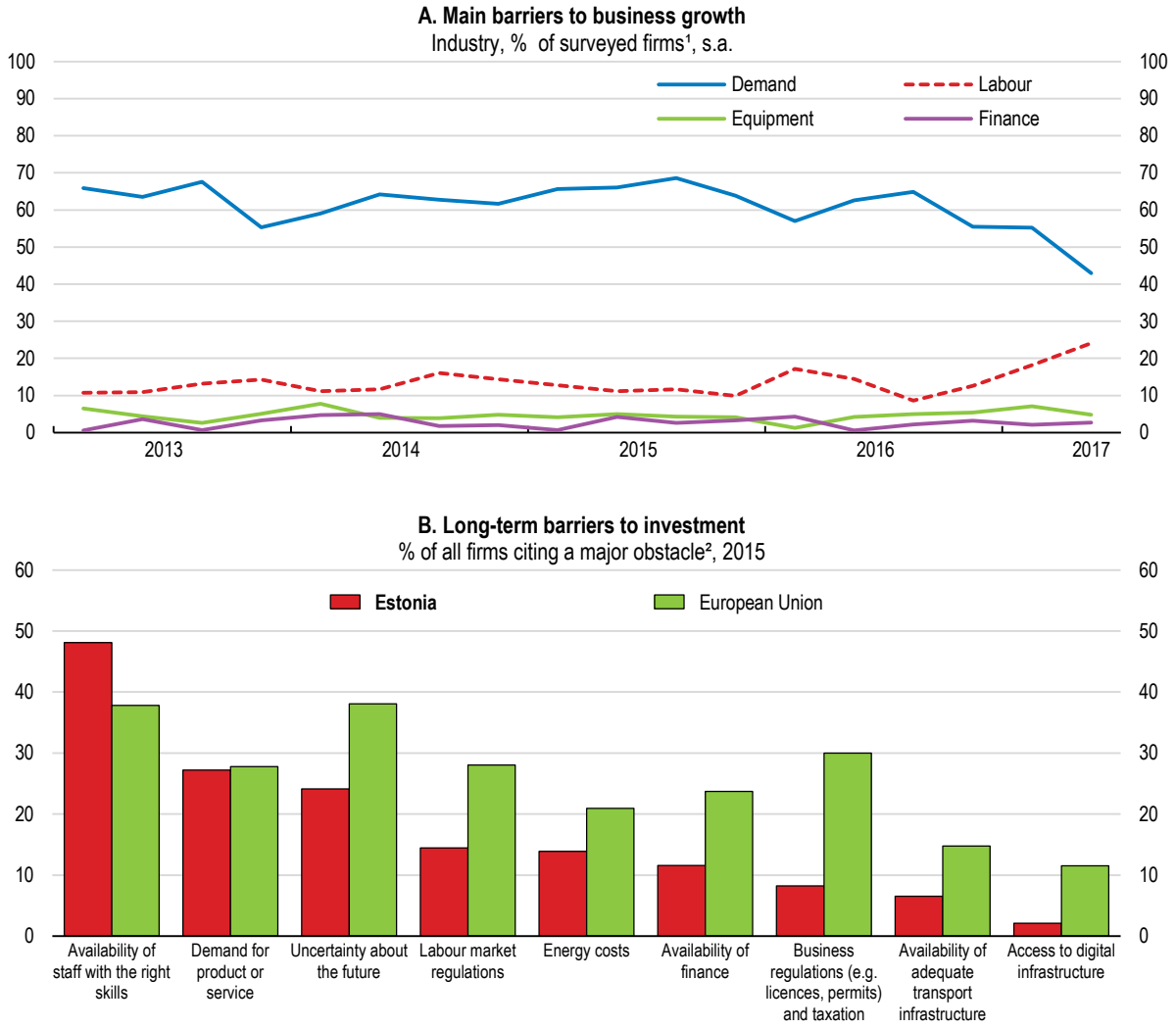
Source: Eurostat (2016), Community Innovation Survey (CIS) 2014.

Low demand only partly explains investment weakness

Demand

Low demand has been identified as the main barrier to business growth by Estonian entrepreneurs (Figure 8, Panel A). As in most other OECD countries, a subdued output performance and weak growth outlook have been the main factors constraining investment (Barkbu et al., 2015; Lewis et al., 2014). GDP growth decelerated sharply from 7.5% in 2011 around 2% in 2015-16, and capacity utilisation has remained below the historical average over the past decade. Exports have been hit by poor economic performance in Russia and Finland, two important trading partners. Cuts in exports to these two countries are likely to have had a relatively strong impact on investment because their value-added content is higher than the national average (European Commission, 2016a). This could partly explain why the level of business investment is well below what its past relationship with GDP suggests (Figure 9). Lower EU funds disbursements at the beginning of the new programming period (2014-20) also played a role.

Figure 8. Low demand and labour shortages are viewed as main obstacles to business growth



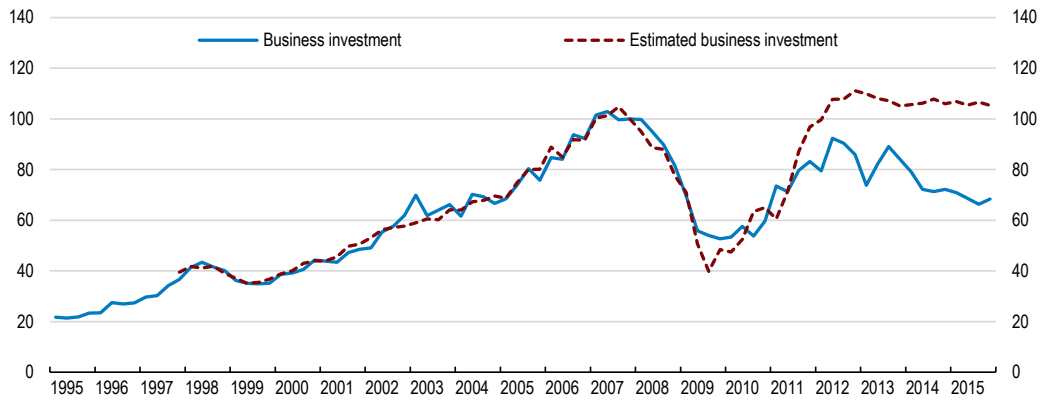
1. Firm responses to the question: "What main factors are currently limiting your production?" Respondents are requested to select one or several factors (none, insufficient demand, shortage of labour force, shortage of material and/or equipment, financial constraints, and other factors).

2. Firm responses to the question: "Thinking about your investment activities in your country, to what extent is each of the following an obstacle? Is a major obstacle, a minor obstacle or not an obstacle at all?".

Source: European Commission, Business and consumer surveys database; European Investment Bank - EIBIS, EIB Investment Survey.

Figure 9. The GDP slowdown does not fully explain the recent drop in investment

Simple accelerator model of non-residential investment, value of actual investment in 2007 Q4 = 100



Note: In real terms. Actual GDP and capital stock series used to calculate the forecast based on 1997 Q4-2007 Q4 estimation. In the estimations, the level of investment is explained by current and lagged changes in real GDP and replacement investment. For more information on the methodology: OECD (2015), OECD Economic Outlook, Vol. 2015, No. 1, June, Annex 3.1.

Source: OECD (2015), OECD calculations based on OECD Economic Outlook: Statistics and Projections Database.

Uncertainty

Elevated uncertainty due to heightened geopolitical tensions has held back business investment. Fixed costs make investment decisions costly to reverse and give an incentive to postpone or cancel decisions when uncertainty is high (Bernanke, 1983). Despite some improvement since mid-2015 and until 2017, business confidence in Estonia has remained below historical levels. Rising protectionism and on-going economic sanctions against Russia has hung over external demand. Uncertainty might also stem from the acceleration of export diversification: exporters are trying new markets, but it remains to be seen if these markets can be retained. Finally, reduced predictability about changes in the tax system and business legislation due to the recent changes of government might have been temporarily deterring capital accumulation.

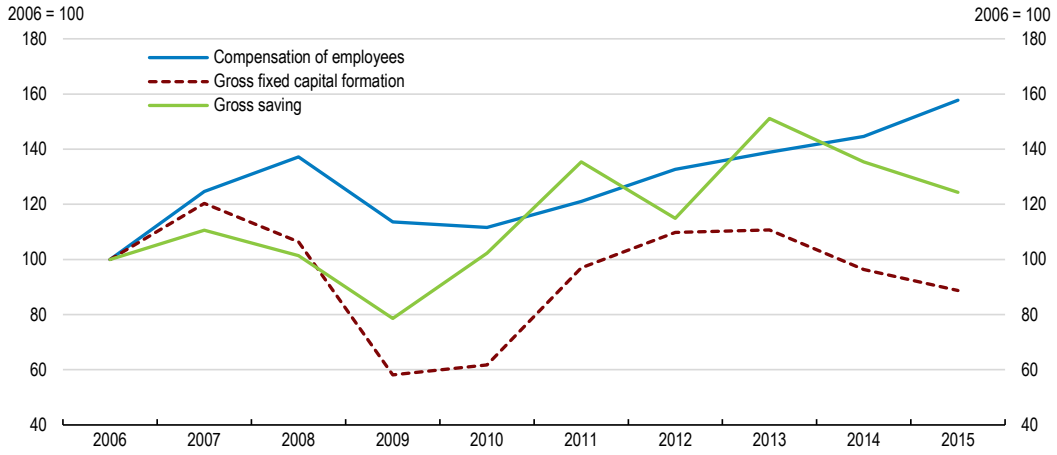
Finance

Access to funding has not been a major obstacle to capital spending (see Figure 8). Only 6% of Estonian businesses claim that access to finance is the most important barrier to growth, one of the lowest shares in the EU and 6 percentage points below the level seen during the crisis. Credit growth has remained subdued and skewed toward short-term financing, but this mainly reflects a low level of demand for credit rather than supply constraints (Eesti Pank, 2017).

Savings and liquidity levels have reached historical highs in the corporate sector, despite a decline in firms' profitability (Figure 10). Corporate indebtedness has declined and non-performing loans are among the lowest in the EU, suggesting that profits have been directed either to debt repayments or deposits in banks rather than being used for capital spending. This is symptomatic of a wait-and-see attitude, reflecting the currently high level of uncertainty on investment returns.

Figure 10. Increasing savings have not been used to invest

Non-financial corporations, value



Source: OECD National Accounts Statistics.

Skill shortages

The lack of an adequately educated workforce is increasingly cited as a barrier for doing business, particularly in the service sector (see Figure 8; World Economic Forum, 2016). Estonia is an ageing country with a fast-declining working age population, and tensions on the labour market have materialised in some sectors. Current and expected labour shortages are particularly prevalent in several occupations that are central for intangible investment and the adoption of digital technologies (experienced managers, teachers, ICT specialists, engineers) (EU Skills Panorama, 2014).

The impact on capital spending of tensions on the labour market is uncertain. Labour shortages are likely to foster capital intensity in sectors where workers can be replaced by machines. Capital deepening should also be facilitated by lower relative prices of investment goods (Karabarbounis and Neiman, 2013). Nevertheless, while changes to production technology can be freely chosen before starting a business, large fixed costs might impede the substitutability between labour and capital afterwards (Baddeley, 2003).

Skill shortages can partly explain Estonia's relatively low intangible investment. Empirical evidence points to complementarity between the availability of highly skilled workers and investment in knowledge-based and technology-intensive capital. As a result, skill shortages have sizeable adverse impacts on technological adoption and investment (Forth and Mason, 2006; Nickell and Nicolitsas, 2000; OECD, 2013).

Growing tensions on the labour market can undermine Estonia's attractiveness for foreign investors. International companies, especially those investing in knowledge intensive services, tend to move to markets which offer skilled workforce (Carstensen and Toubal, 2003; Doh et al., 2009). In addition, in labour intensive sectors, labour shortages can pose some risks to price competitiveness for exporting firms (OECD, 2017d).

Investment is likely to remain below pre-crisis levels

Despite the recovery of the economy, prospects for investment are likely to be weaker than before the crisis. First, part of the investment decline is likely to be due to a correction. Excessive credit growth led to a build-up of unsustainable debt before the crisis. Pre-crisis investment rates were too high in light of

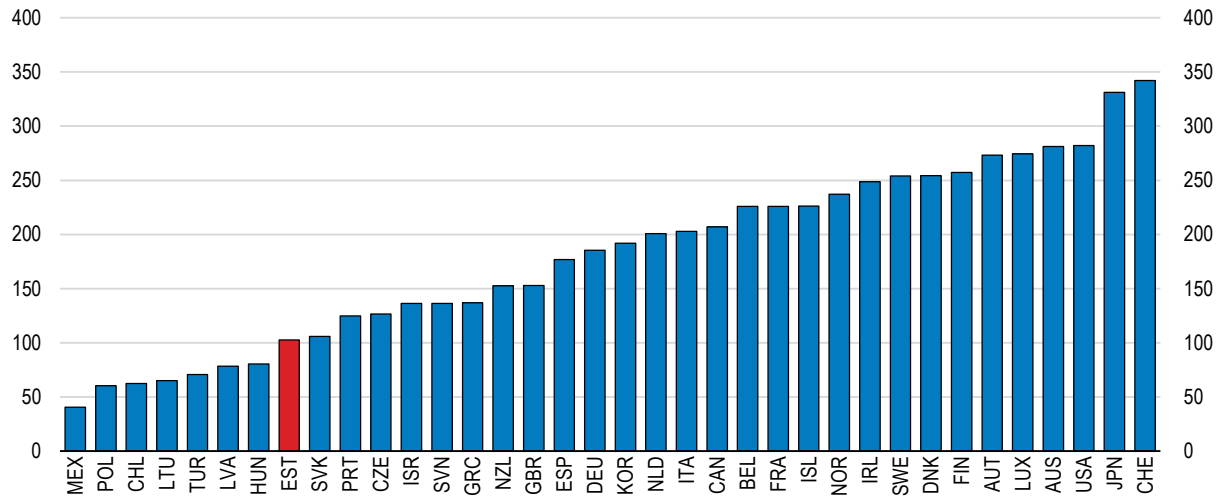
growth potential, exceeding steady-state investment ratios (IMF, 2016; Lewis et al., 2014). In particular, the real estate sector went through a boom-bust cycle and investment in construction has normalised after the bust in 2008-09.

Second, a persistent weak growth prospect can lower investment rates compared to past decades. Since 2012, forecasters have revised GDP growth for the next six to ten years by around 1 percentage point (from 3.6% to 2.8%). The main growth engines have lost steam. On the demand side, global trade growth is unlikely to recover its pre-crisis level and risks of protectionism are building up. Domestic markets are saturated and household income growth is expected to flatten. On the supply side, multifactor productivity growth has sharply declined and population ageing will continue to weigh on the labour force.

Estonia's capital intensity is well below the OECD average, suggesting there is considerable room for further capital deepening (Figure 11). Nevertheless, uncertainty exists over whether the country has already seized the majority of investment opportunities related to the transition, and if its position in the convergence process is such that capital accumulation should now decelerate (the investment-to-output ratio tends to decline in the later stages of the convergence process; IMF, 2016).

Figure 11. Capital intensity remains well below the OECD average

Non-residential capital stock per worker, USD thousand, 2016



Source: OECD Economic Outlook 101 database.

Improving investment conditions

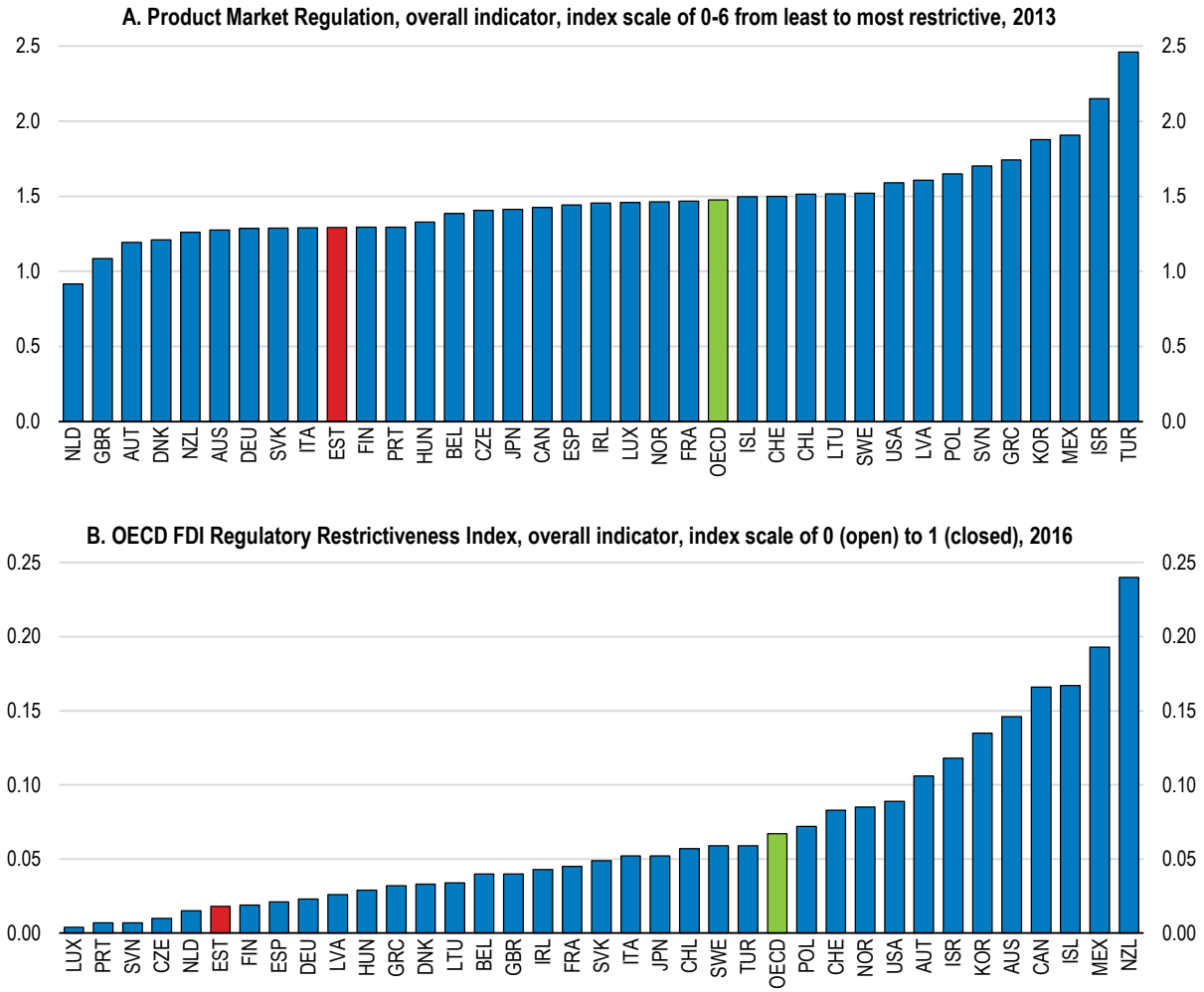
Eliminating obstacles to business is of paramount importance to maintaining attractiveness for both domestic and foreign investors. Estonia's small size is a natural barrier for large-scale projects but its business environment is among the most investment-friendly in the OECD, supported by a political willingness to continuously improve business conditions. Nonetheless, investment conditions could be improved further. Inefficiencies in insolvency procedures could increase the risks for creditors and undermine efficient capital allocation. Also, low competition in the banking sector and absence of alternative funding modes could limit access to finance for small and innovative investors.

Business environment is supportive and competitive

Estonia's business environment is favourable, offering competition-friendly regulation and low corporate taxation, resulting in a high ranking in the World Bank's Doing Business and the World

Economic Forum's Competitiveness reports. The PMR indicators and the FDI Regulatory Restrictiveness Index, which respectively measure the restrictiveness of product market regulation and the statutory restrictions on foreign direct investment, are below the OECD average (Figure 12).

Figure 12. The business environment is favourable



Source: OECD, Product Market Regulation Database, OECD FDI Regulatory Restrictiveness Index database

Red tape has been reduced significantly with the digitalisation of public administration. Enterprise Estonia – a public agency in charge of business promotion - offers targeted services to foreign investors, including support in complying with administrative procedures. The taxation system is simple and highly competitive, with no taxation on reinvested profits. The planned reduction of the tax rate on distributed profits for mature companies (from 20% to 14% for companies that pay dividends for three consecutive years) is unlikely to have any positive impact on investment by domestic firms. Furthermore, it will add complexity to the tax system and penalise young firms whose distributed dividends will be taxed at a 20% rate.

Recent initiatives aim at reducing red tape further. The "zero bureaucracy" programme launched in 2016 aims at identifying and addressing remaining business hurdles and reducing the administrative burden. A business account has also been created to abolish reporting and accounting obligations for micro-entrepreneurs under a number of conditions, including a EUR 25 000 threshold for annual turnover. This initiative is welcome, but policy makers should make sure the threshold does not create a disincentive for small businesses to grow or to declare revenues.

The e-residency programme launched in 2015 provides a digital identity to foreign citizens, giving them access to a range of digital services, including creating a company, conducting e-banking and declaring taxes online. The initiative, which reduces transaction costs for foreign investors, has shown some positive results: the 14 000 Estonian e-residents are estimated to have created around 1 000 enterprises and generated around EUR 3 million in revenues in 2016. The authorities should ensure that adequate controls are in place to prevent, detect, and report money laundering. Other initiatives include a new programme that allows non-EU nationals to come and work for Estonian start-ups, relocate their existing start-ups or establish new ones in Estonia on preferential terms (OECD, 2017d).

Notwithstanding the very good business conditions, some unjustified regulatory barriers to entrepreneurship remain and should be removed, as detailed in the *2015 Economic Survey* (OECD, 2015a). In particular, entry barriers in services, such as exclusive rights for engineers, architects, accountants and lawyers are likely to increase the costs of intermediate inputs. Also, as pointed in the *2017 OECD Environmental Performance Review*, environmental regulation for the issuance of issue-specific permits, in force since 2014, imposes a significant administrative burden, particularly on SMEs. The regulatory regime for installations with low environmental impact should thus be simplified (OECD, 2017a).

The administrative and information costs of trade can be reduced by aligning with best international practice for trade facilitation (OECD, 2017d). This includes completing the one-stop shop for formalities and making more use of advance rulings (i.e. binding statements by the administration on regulatory rules applied to specific goods) to increase regulatory certainty.

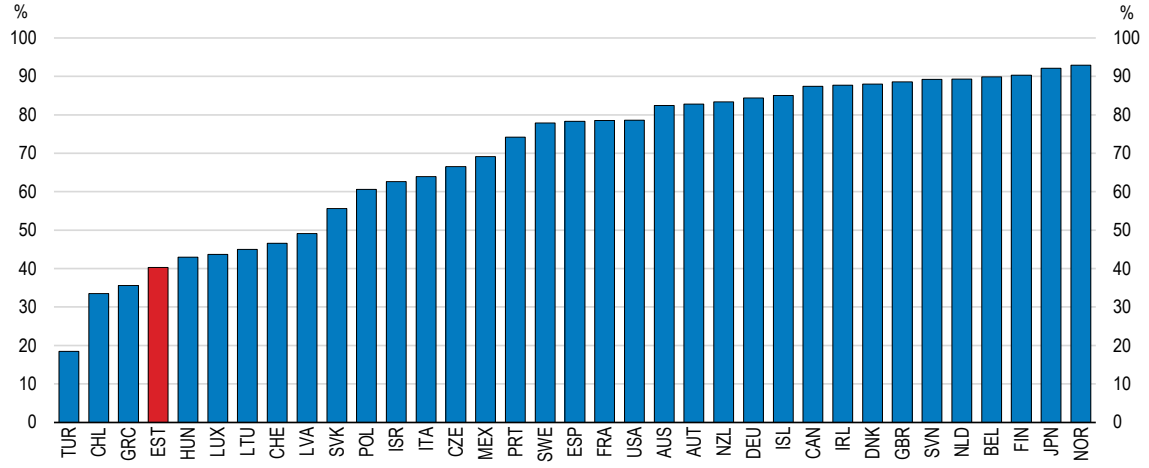
The existing regulatory framework can also be improved to ensure that regulation is fit for purpose and achieves its goals. Estonia introduced the obligation to conduct ex-post evaluation for all new major primary laws in 2012 but no evaluation has taken place since then (OECD, 2015c).

Addressing deficiencies in insolvency proceedings

The cost of closing down a business in Estonia remains high, with potential negative spill-overs to incentives to invest and cost of credit. Bankruptcy procedures are long and the recovery of creditor claims is weak (Figure 13). A considerable stigma of a business failure exists in Estonia: some 40% of 18-64 year olds cited the fear of failure as an obstacle to setting up a business in 2014 (OECD, 2015a).

Figure 13. Credit recovery is low

Average recovery rate[1]



1. The recovery rate is calculated based on the time, cost and outcome of insolvency proceedings involving domestic legal entities and is recorded as cents on the dollar recovered by secured creditors.

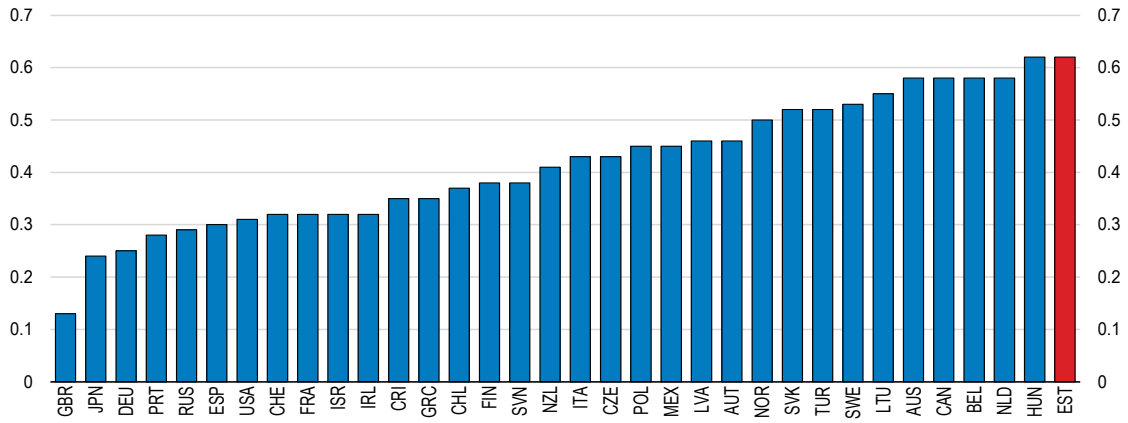
Source: World Bank, Doing Business 2017.

The ultimate objective of any insolvency framework is to strike a balance between leniency for entrepreneurial failure and protection of creditors. Bankruptcy laws that do not overly penalise business failure are likely to support capital spending. At the same time, creditors' protection is important to support credit supply. Estonia seems to have ample room for improvement vis-à-vis best practice both in terms of the framework and outcomes of corporate insolvency proceedings. In particular, features of the insolvency regimes tend to restrict capital re-allocation between profitable and insolvent firms, with slow initiation and completion of insolvency procedures, as highlighted by a new OECD indicator (Figure 14). This is thus welcome that the Ministry of Justice has tasked a group of specialists and stakeholders to review the legislative framework and propose amendments by end-2017.

The possibility of an early intervention is key for improving the efficiency of insolvency proceedings. Delays can increase costs and make it less likely that viable firms are successfully restructured (Adalet McGowan and Andrews, 2016). A well-functioning restructuring procedure can improve asset recovery rates and not necessarily take longer than liquidation (Bris et al., 2006). Giving creditors a right to initiate restructuring (as opposed to liquidation only) can increase recovery rates or the chances of the company's survival. A number of countries have early-warning mechanisms in place, such as an on-line self-assessment or training for entrepreneurs (e.g. Denmark, Finland, Sweden), and/or pre-insolvency regimes that allow a speedy out-of-court option. Currently, such mechanisms do not exist in Estonia, where only a small fraction of companies are successfully restructured.

Figure 14. The insolvency regime is inefficient

OECD indicator of insolvency regimes[1], 2016



1. A higher value corresponds to an insolvency regime that is most likely to delay the initiation of and increase the length of insolvency proceedings. Composite indicator based on 13 components: time to discharge; exemption of assets; early warning mechanisms; pre-insolvency regimes; special insolvency procedures for SMEs; creditor ability to initiate restructuring; availability and length of a stay on assets; possibility and priority of new financing; possibility to 'cram-down' on dissenting creditors and dismissal of management during restructuring; degree of involvement of courts; distinction between honest and fraudulent entrepreneurs and the rights of employees. For more details, see Source

Source: Adalet McGowan, M., D. Andrews and V. Millot (2017), "Insolvency Regimes, Zombie Firms and Capital Reallocation", OECD Economics Department Working Papers, No. 1399; and Adalet McGowan, M. and D. Andrews (2017), "The Design of Insolvency Regimes", OECD Economics Department Working Papers, forthcoming.

Governance, oversight and procedural aspects of insolvency could also be enhanced. Accountability of and incentives for company managers, board members and owners to file for bankruptcy early, while there are still reasonable chances of restructuring and/or asset recovery, are low in Estonia. The authorities are considering the creation of the office of bankruptcy ombudsman, which would have powers to investigate reasons for insolvency. If neglect by managers or owners were found to be the cause, the ombudsman could initiate criminal proceedings, as done in Finland. The proper functioning of the courts and expertise of the judges is key for ensuring quality of procedures and equal treatment before the law. As

recommended in previous *Economic Surveys*, the establishment of specialised bankruptcy courts should be considered (OECD, 2015a, OECD, 2011).

Continuation of business operations under restructuring increases the chances of a successful outcome and is usually achieved by a stay on assets, a period during which creditors cannot continue debt-collection. However, because this mechanism limits the ability of creditors to recover their loan, it can increase the cost of credit; thus some countries limit the length of the stay (for instance between 2 and 4 months in Germany, Ireland and the United Kingdom). The absence of a limit on the length of the stay in the Estonian legislation can delay resolution and should be reconsidered.

International best practice also suggests that, in the event of liquidation, new financing should have priority over unsecured creditors unless agreed by them, since this can otherwise negatively affect the availability of credit (Adalet McGowan and Andrews, 2016). Such an arrangement encourages the capital injections required to facilitate the reorganisation of firms and should be introduced in Estonia.

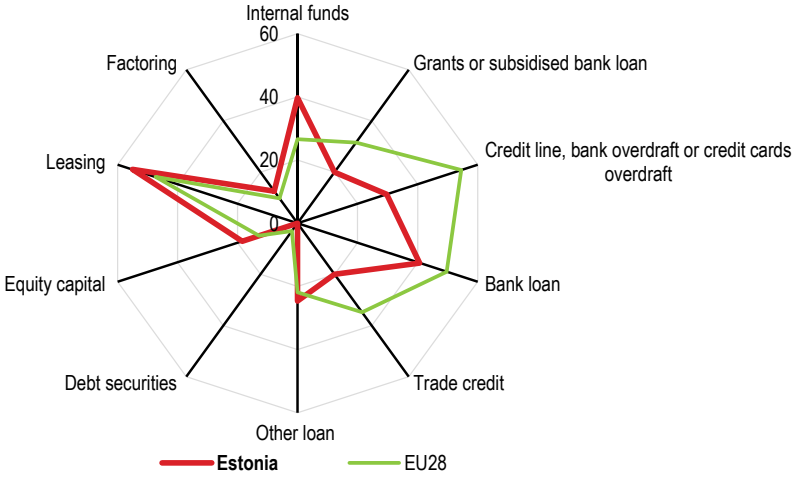
Improving access to finance

Access to funding has not been a major obstacle to capital spending over the past few years (see Figure 8). Financial constraints have been overshadowed by other obstacles, notably weak trade prospects, a high level of uncertainty and issues with the availability of skilled staff. One question mark, however, is whether businesses, in particular small innovative firms, will face financial constraints when demand for credit will recover.

The high profitability and capitalisation of the financial sector and the low level of non-performing loans indicate that the banking sector is well equipped to finance investment projects. At the same time, Estonian businesses are much more likely to rely on internal funds and use less bank financing than in the EU or in neighbouring countries (Figure 15). Only 41% of Estonian businesses have borrowed from a bank or plan to do so in the future, and only 30% have had a credit line, overdraft or credit card. These are some of the lowest ratios in the EU; they reflect the zero taxation on reinvested profits but also a certain level of apprehension towards using banking services. A relatively low share of businesses are comfortable talking to their bankers, and 12% of Estonian businesses did not apply for a bank loan because of fear of rejection – one of the highest percentages in the EU (Figure 16).

Figure 15. Firms mainly use internal funds to finance investment

In % of firms stating that they used these sources of financing in the past or considered using them in the future

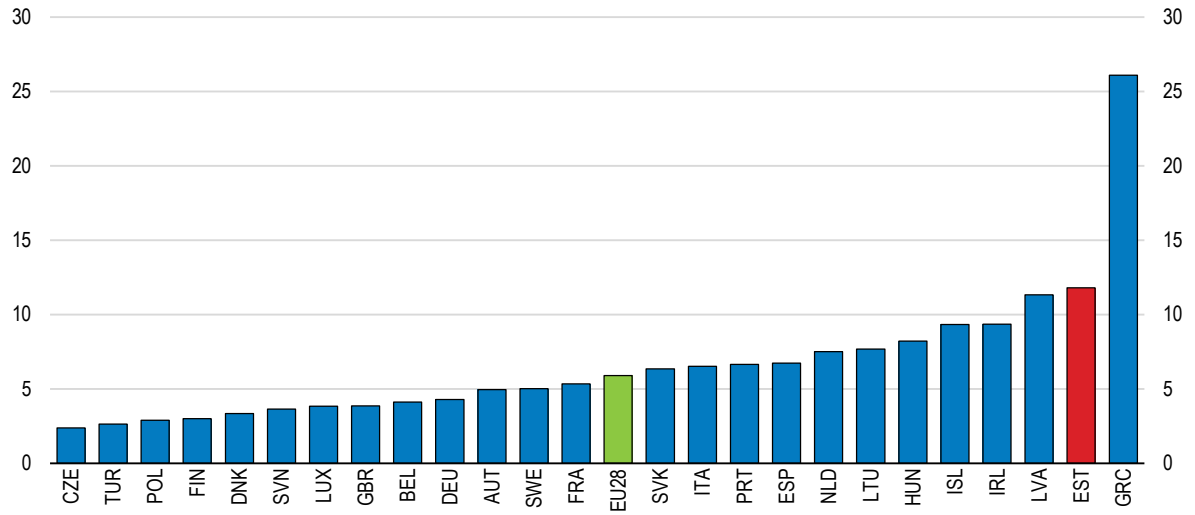


Source: 2016 SAFE Survey on the access to finance of enterprises.

Only 7% of Estonian SMEs consider that access to finance constrains long-term investment decisions (vs. 6% on average in the EU, EIB Investment Survey, 2017). At the same time, SMEs continue to face relatively higher lending rates and are more likely to perceive their financial situation as constrained (EIB, 2016). The difference between small and large firms in that respect is much pronounced in Estonia than in the European Union (EIB Investment Survey, 2017). In particular, around 16% of micro enterprises, which account for around 90% of all firms, consider they are financed-constrained (i.e. are dissatisfied with the amount of finance obtained, have sought external finance but did not receive it and or did not seek external finance because of its expected cost or the fear of rejection), twice the EU average.

Figure 16. A large share of firms does not apply for bank financing because of possible rejection

Per cent of firms that did not apply for bank financing because of possible rejection



Source: 2016 SAFE Survey on the access to finance of enterprises.

The low level of competition is likely to induce credit rationing

Economic literature shows that low competition in the banking sector could induce credit rationing, in particular for small and innovative firms. The Estonian banking market is one of the most concentrated among OECD countries, with two large foreign-owned banks controlling 84% of the market. Also, relatively high mark-ups in the Estonian banking sector – i.e. the difference between output prices and marginal costs, relative to prices – indicate a low level of competition (Cuestas et al., 2017; Clerides et al., 2015). By creating the third-largest bank in Estonia, the recent merger between Nordea and DNB further increases market concentration. The impact on competition and financial stability is uncertain, as the merger creates another dominant player in the financial sector.

Market power magnifies credit constraints for SMEs (Carbo-Valverde et al., 2009; Love and Peria, 2012). The negative impact of the market power on access to finance appears to be particularly strong in countries with bank-dependent financial systems like Estonia (Ryan et al., 2014). In addition, foreign banks with complex and hierarchical structures tend to lend less to SMEs and start-ups (Stein, 2002; Havrylchyk, 2012; Havrylchyk at al., 2012). Strategic decisions on liquidity and capital provision are taken by the parent bank abroad. Foreign subsidiaries rely less on soft information and engage less in relationship lending compared to domestic banks.

No recent analysis of competition in the banking market has been performed to assess the impact of high concentration on credit supply, intermediation costs, client satisfaction and barriers to switch supplier.

The Estonian Competition Authority should carry out such an in-depth analysis as done for instance by UK regulators (CMA and FCA, 2014). A post-merger analysis should also be conducted given its potential negative impact on credit and financial stability.

Reducing informational barriers

Entry of new players to Estonia's financial system can be difficult, given the absence of a proper credit information-sharing scheme. By providing information to credit providers, such a scheme reduces adverse selection problems for banks and hold-up problems for borrowers in switching supplier. A well-designed credit registry lowers the cost of intermediation and improves access to credit in Central and Eastern European countries (Brown et al., 2009). Also, information sharing provides valuable data that can be used to design and evaluate micro-, macro-prudential and monetary policies.

In Estonia, negative information on borrowers (non-repayment and/or loan restructuring) is available from private credit bureaus, but the major banks do not share positive information (loan conditions and repayment). A credit information-sharing scheme should be established to collect both positive and negative information. This could be done by private credit bureaus, as done in the UK and the US, or by establishing a central credit registry by the central bank, as done in France, Spain, and Italy. The scheme should cover all individuals and firms, including the small ones.

Developing alternative sources of funding

Domestic firms are highly reliant on banking finance for external financing as other funding modes, such as corporate bonds and equity funding remain undeveloped (European Commission, 2017). Immature and fragmented private equity and venture capital industries impede funding of small innovative firms (EBRD, 2016a). In particular, venture capital investments have been relatively low (accounting for around 0.02% of GDP, half the OECD average in 2015). Access to risk-oriented funding is improving though, with the establishment of state-owned funds of funds, i.e. funds that invest in existing private equity and venture capital funds (e.g. Estfund and the Baltic Innovation Fund), but it is too early to evaluate their effectiveness.

The development of alternative funding modes can enhance access to finance in Estonia. As proposed in the *2015 Economic Survey*, the financial industry could be diversified by granting banking licences to savings and loans associations (OECD, 2015a). Another avenue is to remove barriers for sustainable development of Fintech platforms, which provide peer-to-peer lending and equity-based crowdfunding (Box 2.1).

Fintech platforms can provide financial services to SMEs and start-ups, whose needs are unmet by banks, as they require lower levels of guarantees. Retail investors choose whom they would like to finance on digital platforms and bear all investment risks. The platforms themselves do not invest in contracts and securities, but generate profits from the origination and servicing fees that they charge funders and fundraisers. Equity crowdfunding platforms can complement angel- and venture-capital, by allowing individuals to invest in start-ups and buy shares which are not listed on the regulated stock market. Also, this sector can offer new business opportunities to Estonians ICT companies.

Some of the most innovative Fintech start-ups have been created in Estonia, which is now one of the largest markets for alternative finance (Figure 17). Nevertheless, the scale of finance through this channel remains limited, and peer-to-peer lending to SMEs lags far behind consumer lending (see Box 2.1). The sustainable development of alternative finance requires the creation of a level playing field between traditional and alternative sources of credit in terms of access to information, regulation, and taxation. The supply of funds in Fintech platforms also requires strengthening the protection of creditors.

Box 1. Fintech in Estonia

Fintech refers to the use of technology and of technology-facilitated new business models in the provision of financial services (World Economic Forum, 2015). It covers peer-to-peer lending, equity crowdfunding, electronic payment solutions, blockchain technology, digital currencies, digital advisory and trading systems, as well as artificial intelligence and machine-learning.

Some of the most innovative Fintech start-ups have been created in Estonia. The most successful is TransferWise, an international payment platform that allows individuals and small businesses to transfer money between international accounts. Now headquartered in London and supervised by the Financial Conduct Authority, TransferWise uses peer-to-peer technology to match users across different countries and currencies, which is cheaper and faster than relying on the centralized payment infrastructure used by banks.

Estonia is also home to a number of platforms that provide debt and equity financing for individuals and SMEs (Table 1). One, Bondora, has been ranked as one of the largest European peer-to-peer lending platforms for unsecured consumer loans. With over 300 000 customers, it has funded over 30 000 loans in Estonia, Finland and Spain. Equity crowdfunding platforms recently established in Estonia include Funderbeam, the first worldwide secondary market for venture capital.

Table 1. Fintech providers of debt and equity funding in Estonia

	Amount of financing raised in EUR mln (since establishment until June 2017)	Number of projects funded	Rejection rate	Security	Business model	Launch year
Investly in Estonia	8.2	409	-	Invoice	P2P invoice financing	2014
Bondora	94.2	37 917	85%	No	P2P consumer lending	2008
EstateGuru	24.7	154	90%	Property and personal guarantee	P2P property lending	2014
CrowdEstate	20	43	90%	Depends on the project	P2P property lending	2014
Fundwise	0.8	11	-	No	Equity crowdfunding	2015
Funderbeam	3.9	15	97	No	Equity & bond crowdfunding	2016

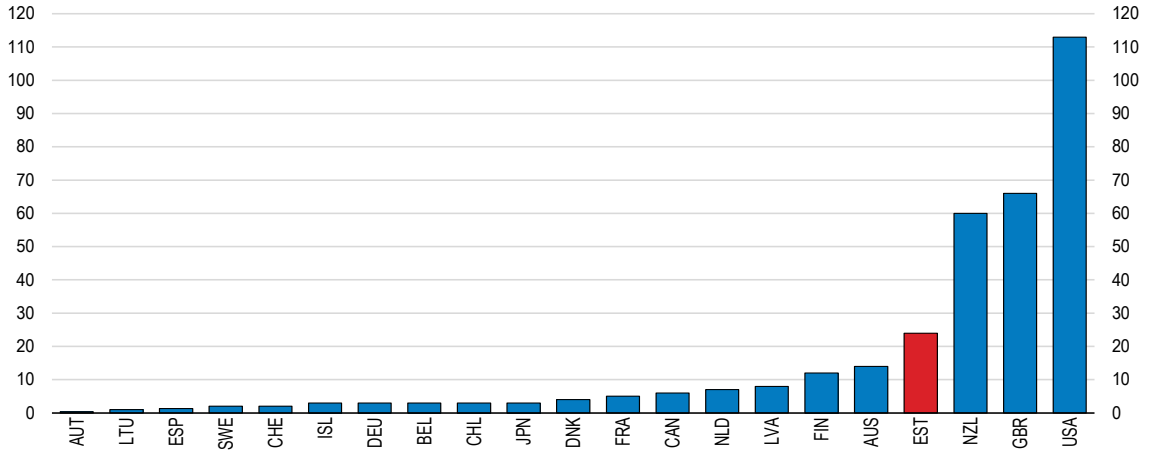
Source: OECD Secretariat

Regulatory oversight of Fintech platforms should be developed to reinforce the protection of creditors and support credit supply. Platforms should be subject to simplified licencing requirements allowing the financial supervisor to verify that they have a suitable business plan and risk management in place, and that their management board has adequate knowledge in both ICT and finance, as done for instance in the UK. Platforms should also be required to have resolution plans to ensure that collection of repayments continues in the case of bankruptcy. Given the high level of risk, new consumer protection rules should be established, such as requiring that individuals cannot invest more than 10% of their assets in equity crowdfunding platforms as done in the UK.

Information about Fintech platforms should also be improved. The Estonian Consumer Protection Board responsible for the financial consumer protection does not inform consumers about Fintech developments, such as peer-to-peer lending, equity crowdfunding, and online payments. Platforms should also be required to publish clear information so that funders can make informed decisions. Transparency is one of the defining features of the lending platforms, which publish a large amount of data. However, reported returns and default rates are not always clearly defined and are not comparable across platforms. Finding information about the average default rates for loans issued on a platform is far from straightforward. Lenders should also be made aware that, even though some platforms offer property loans, these are often not secured by a mortgage.

Figure 17. Estonia is a frontrunner in alternative finance but amounts are low

Volumes, in euros per capita, 2015



Note: Alternative finance includes peer-to-peer lending, equity crowdfunding, donation and reward crowdfunding, as well as balance sheet lending.

Source: Cambridge Centre for Alternative Finance.

The lack of credit information sharing in Estonia constitutes an important barrier for the successful development of Fintech platforms, which do not have access to the credit history of their potential borrowers. Their scoring models are likely to provide inaccurate risk scores as they use information provided by borrowers that cannot be properly verified. In addition, the lack of a comprehensive credit registry prevents the platforms from assessing the total indebtedness of individual borrowers. Since the risk is born by investors, this creates important agency problems. Fintech platforms have a competitive advantage for the use of big data and algorithms to screen and monitor borrowers as they can change and test their internal risks models without having them approved by regulators. This competitive advantage cannot be fully seized because of the lack of credit information sharing.

Finally, the taxation of capital income should be harmonized. Currently, investors cannot deduct their losses on Fintech platforms from their income tax base. This distorts the playing field between Fintech funding and other types of funding (i.e. bonds or equity), making Fintech platforms less competitive. Also, investment via peer-to-peer lending platforms cannot be included in investment accounts which allow individuals postponing the taxation of investment income.

Addressing skill shortages

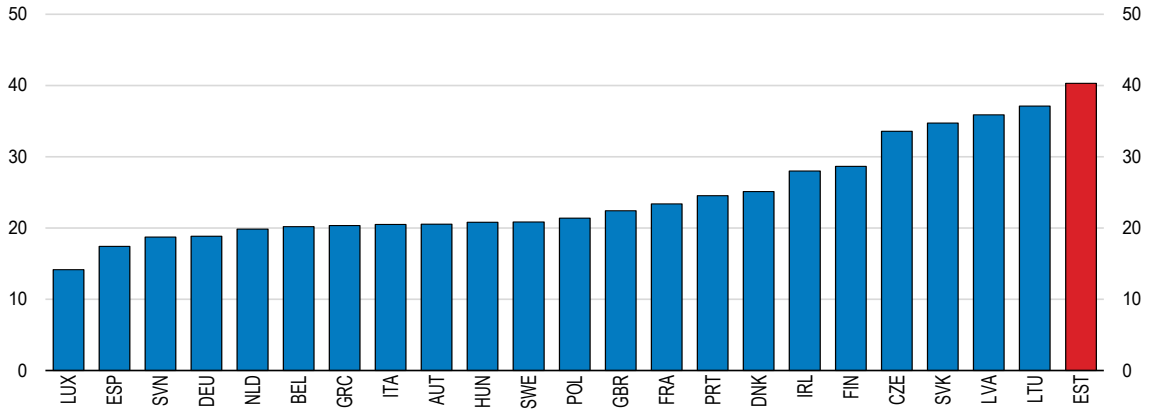
The lack of a skilled workforce is one of the main barriers to long-term investment in Estonia (see Figure 8). The low level of investment in intangible capital could also relate to a lack of competencies to adapt to changing technologies. Tertiary education attainment in Estonia is among the highest in the OECD and adults perform very well as regards information-processing skills. Improvement in PISA scores since 2006, which exceed the OECD average, suggests that future workforce will be better equipped than older cohorts. However, Estonia lags behind when it comes to the capacity to solve problems in a technology-rich environment (Ministry of Education and Research, 2015). The need for workers able to recognize the possible application of ICT solutions in their field has been accelerating and demand for ICT professionals is projected to increase by a half over the next decade (Sihtasutus Kutsekoda, 2016).

Around 30% of adults do not have professional qualifications, and in 2014 around 40% of employees reported that their skills were lower than the level required for their job at the time of hiring, the highest share in European Union countries (Figure 18). Some dissatisfaction with the level of general skills is present among employers too, notably for problem-solving and soft skills, including communication or collaboration skills (EU Skills Panorama, 2014).

The organisational capabilities of firms (i.e. the ability of managers to coordinate and manage production, the skills of workers and the functions they accomplish) is crucial for adoption and implementation of new technology and practices, as well as for reducing skills mismatch amongst workers (Bloom et al, 2012; Adalet McGowan et al., 2015). While Estonia does rather well in terms of management quality and practices vis-à-vis CEE peers, it lags behind higher income countries (World Economic Forum, 2015). As stressed in the *2015 Economic Survey* (OECD, 2015a), early exposure to managerial and entrepreneurial skills is key for the development of management competencies. Curricula in secondary education have been amended in this direction, but the initiative is too recent to show some impact.

Figure 18. A large share of Estonians feels under-skilled

The share of employees reporting lower skill level than required for their jobs at the time of hiring, 2014



Source: CEDEFOP (2016), "Skills Panorama – The EU workforce: under-skilled at hiring" (http://skillspanorama.cedefop.europa.eu).

Identifying skill needs and providing adequate career guidance

A large set of measures have been implemented to adapt education to current and future labour market needs. For instance, more emphasis has been put on soft and entrepreneurial skills in curricula at all levels and all types of education. The funding of higher education institutions is increasingly based on performance, including on the labour market outcomes of students. The 2020 Lifelong Learning Strategy and the Estonian Development Plan of Information Society 2020 include measures to develop digital competencies beyond the ICT sector, such as e-assessment instruments for ITC skills, training courses for teachers, requirements in terms of digital skills in qualification standards (European Commission, 2016b). As discussed in OECD (2017d), greater emphasis is also put on the acquisition of practical learning and should be supported further by developing apprenticeship in particular.

A skills forecasting system (OSKA) analyses changes in skills requirements and labour market developments. It provides inputs used for career counselling, the design of curricula and the financing of educational institutions. A regular cooperation platform between business representatives and relevant ministries has also been created to discuss the content of educational programmes and the strategic planning at all levels of education. While this improves the information level on how to adapt the education offer to structural changes, it remains to be seen how it is used by educational institutions.

Providing information on labour market opportunities and adequate career guidance is central to ensuring educational choices match labour market needs. Only 11% of Estonians have used career guidance, around half the EU average (European Union, 2014). The qualification and career counselling system has been strengthened over recent years: indicators for labour market outcomes of graduates are published, career guidance is systematically provided at the end of lower secondary education, and youth guidance centres (called Pathfinder centres) were set up in all counties. For adults, the Estonian Unemployment Insurance Fund has expanded its career counselling services to all people of working or retirement age since 2015.

Efforts should continue in this direction, as the quality of services remains poor in basic education (Santiago et al., 2016). Existing activities focus mainly on career education, given by teachers with little involvement of businesses. Large differences in quality exist between schools. The career counselling system should also be amended to tackle gender stereotypes in the education system: women in tertiary education are still underrepresented in scientific fields, where labour shortages are the strongest. Finally, to encourage students to opt for studies that are the most needed on the labour market, financial incentives could be provided, as done for instance in Slovenia.

Raising the quality of lifelong learning

In the face of a rapidly changing labour environment, lifelong learning is central to maintaining alignment between skills needed on the labour market and workers' competences. Providing learning opportunities throughout the individuals' lifespans also reduces the risk of skills depletion with age. Thanks to a range of measures to promote adult education in Estonia, participation in lifelong learning improved significantly in 2016 and is now higher than in the average OECD country. However, the average number of hours of training remains relatively low and the efficacy of training courses in upskilling participants and meeting employers' needs has come into question. For instance, lifelong education of teachers has raised concerns, notably on the insufficient relevance of programmes (Santiago et al., 2016).

The lifelong learning strategy sets ambitious target for adult education, including a 20% participation rate by 2020 (vs. 16% in 2016) and a reduction in the share of adults without professional qualification to 25%. To achieve these goals, a vast range of training opportunities are provided (e.g. free formal education courses, training programmes for unemployed) and a number of additional continuous training measures targeted to those at risk of unemployment have been introduced in 2017.

Measures to improve information on the availability of formal and informal education opportunities and about the effectiveness of different programmes have also been established to enable prospective learners and entities commissioning training to make the best-informed choice. The providers of continuing education and training have an obligation to provide constantly updated information on their activities (e.g. curricula, learning conditions and training providers) and to publish performance indicators. The tax system also provides economic incentives with income tax deductions for training expenditure. Nevertheless, despite these measures, participation of low educated in adult education remains relatively low (OECD, 2017d).

Nevertheless, adult education is not sufficiently monitored (Ministry of Education and Research, 2016). Flexible forms of provision are offered (evening courses, distance learning, open education resources) but it remains to be seen if they effectively meet adults' needs and offer enough flexibility in the sharing of time between work and training. To ensure the quality of training courses and their effectiveness in upskilling participants, monitoring of lifelong learning programmes should be reinforced by using *ex post* evaluation, including of labour market outcomes of participants.

Suppliers of training programmes need to better align with professional development needs. For instance, the absence of an accreditation process for such programmes is an obstacle to professional

development of teachers (Santiago et al., 2016). All training suppliers subsidised by the public sector should go through an accreditation process which should take into account the impact of individual programmes and the level of satisfaction of trainees.

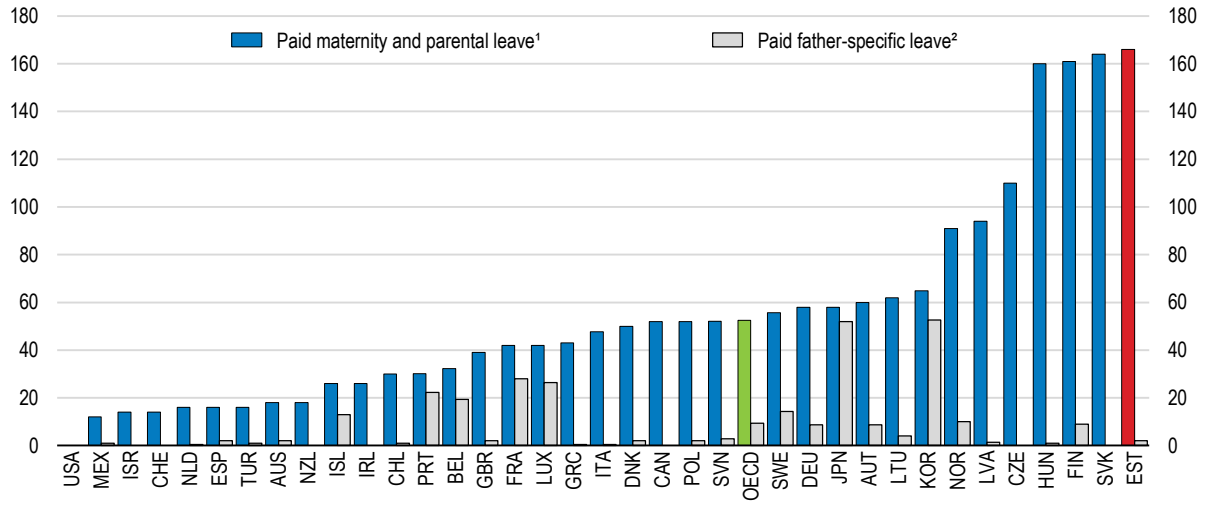
Removing barriers to female employment

Raising the participation of mothers in the labour market and in adult education could significantly increase Estonia's skilled labour supply. While the labour market participation of women is high by international standards, relatively few mothers with a child under 3 are employed (24% in 2014). The gender employment gap for parents is large, while it is close to zero for childless women and men (OECD, 2017b). In addition, participation of mothers in adult education is relatively low (Ministry of Education and Research, 2015). Halving the gender gap in participation would increase the labour force by 3%; simulations based on OECD long-term growth scenarios indicate it would also raise the level of Estonian GDP by 5% by 2030 (OECD, 2012a). Impact on growth is likely to be stronger than estimated, given that women outperform men in terms of qualification level.

Estonia has the longest parental leave in the OECD but father-specific leave is very short (Figure 19). The parental leave is mostly taken up by women. Long leaves have a detrimental impact on careers as skills can deteriorate and the costs to firms of vacancies can induce discrimination against women of childbearing age (Rossin-Slater, 2017; Thévenon and Solaz, 2013). Increasing the length of father-specific leave, as planned by the authorities, is not the most cost-effective way to achieve a better gender balance in childcare responsibilities. Introducing a "daddy quota" as in Sweden or France (whereby the length of the parental leave is reduced if the father does not take his leave) without increasing the total length of the parental leave would accelerate the return of mothers to the labour market at a lower cost.

Figure 19. Parental leave is the lengthiest in the OECD

Number of weeks, 2016



1. Total duration of paid maternity and parental leave refers to the total number of weeks which a woman can be on paid leave after the birth of a child combining both maternity and parental leave.

2. Paid father-specific leave refers to the number of paid weeks reserved for the exclusive use of fathers, including entitlements to paid paternity leave, 'father quotas' or periods of paid parental leave that can be used only by the father and cannot be transferred to the mother, and any weeks of paid sharable leave that must be taken by the father in order for the family to qualify for 'bonus' weeks of parental leave.

Source: OECD Family database.

As stressed in previous *Economic Surveys* and in the recent *OECD Review of School Resources*, expanding childcare and early childhood education facilities is crucial to improving the labour market participation of young mothers (OECD, 2012b; OECD, 2015a; Santiago et al., 2016). Limited childcare options before children turn 18 months make it difficult to flexibly combine family life with professional development. In addition, municipalities which experience population growth appear to face difficulties providing childcare services: shortages have emerged in rapidly growing areas, and the enforcement of quality requirement is not ensured (National Audit Office, 2015a). Unmet needs have been estimated to around 2 300 places (3% of children aged between 1 and 6; European Commission, 2016b)

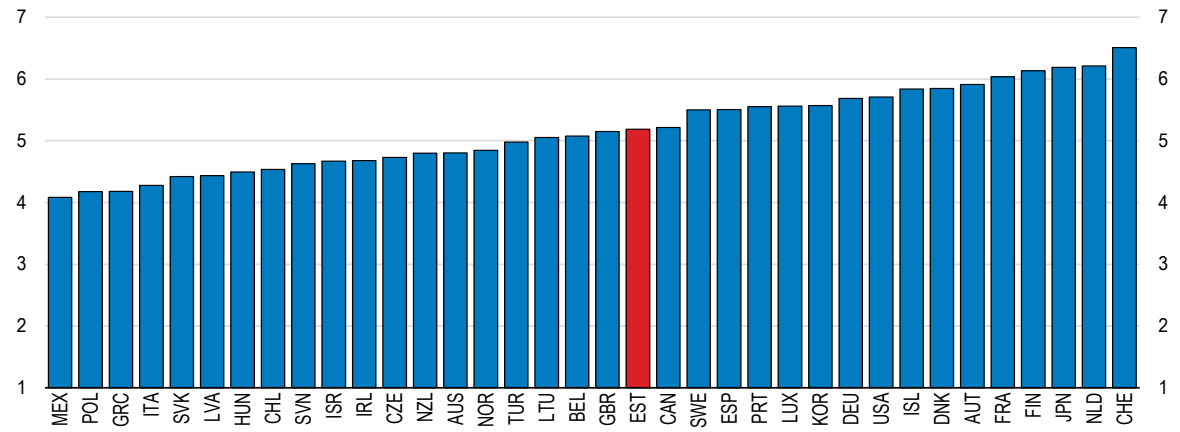
Recent government plans should address this issue as the capacity of childcare services is being increased significantly. Participation of children aged 0-2 in pre-school education rose significantly from 20% to 34% in 2016. With funding from the European Regional Fund, around 2 300 childcare places will be created in larger cities and suburbs (European Commission, 2017). Local governments will also be given more flexibility in organising the provision of high-quality early childhood education and care possibilities based on the needs of families.

Improving infrastructure investment

The quality of energy, transport and communication infrastructure underpins both the success of firms operating in international markets and a country's attractiveness for foreign investors (Yeaple and Golub, 2007). Estonia's infrastructure has been significantly upgraded over recent years, but its quality is still perceived as average, suggesting further investment is needed to facilitate trade and business opportunities (Figure 20).

Figure 20. The quality of infrastructure is average

Quality of overall infrastructure score, from 1 (lowest score) to 7 (highest score), 2016-17



Note: The score is based on the assessment of business leaders operating in the country in response to the question: how do you assess the general state of infrastructure (e.g. transport, communications and energy) in your country? [1 = extremely underdeveloped – among the worst in the world; 7 = extensive and efficient – among the best in the world]

Source: World Economic Forum Global Competitiveness Index dataset.

The government plans to allocate 1.3% of GDP to infrastructure investment over the period 2018-2020. Projects include the extension and modernisation of the road and railway, the development of the broadband distribution network, investments in public residential housing. Cost and benefit analyses have not been systematically carried out for the selection of these projects and given the already considerable levels of investment in road and rail, it is unlikely that they will have high positive economic returns. Indeed, positive impact of infrastructure investment on growth is lower when the physical stock is larger

(Egert et al., 2009). Selecting projects with high economic and social returns requires improving the selection and evaluation process of public investments.

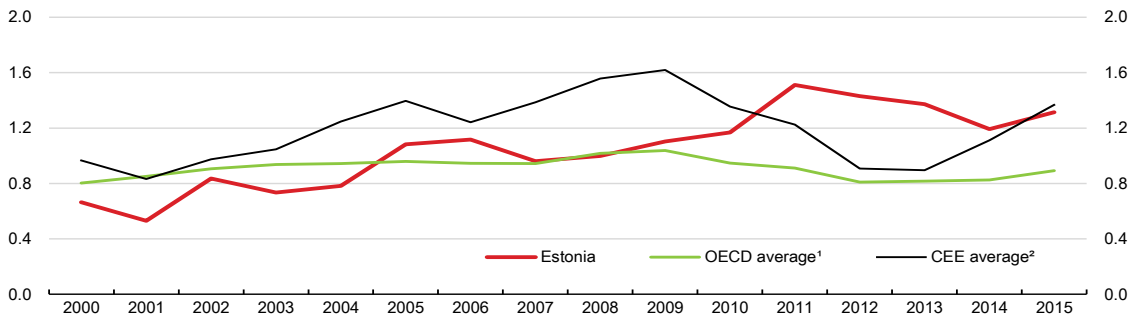
Addressing remaining bottlenecks in the transport sector

Transport networks are key for internationalisation, and given the relatively high share of transport services in GDP and exports (OECD, 2017d), high-quality transport systems are also central for Estonia's economic performance. Estonia has made considerable progress in upgrading its transport infrastructure and services using both national and EU funds. The main bottlenecks have been addressed and the capacity of transport networks appears to be sufficient, especially for freight by land and sea.

Road and rail investment has ranged between 1% and 1.5% of GDP per year since 2009, against an OECD average of around 0.7% of GDP (Figure 21). 20% of funds allocated to Estonia over 2007-2013 have been dedicated to transport infrastructure, and EUR 447 million (2% of GDP) has been allocated to transport projects for the next programming period (2014-20). Finally, 40% of the abovementioned plan for public investment over 2018-20 will be directed to the transport sector. Most of the investment has been directed at projects improving the quality and the capacity of main roads as well as modernising the rail infrastructure.

Figure 21. Investments in road and rail have been high

Investment in road and rail infrastructure, as a percentage of GDP



Note: Estimates of investment data have been made for some countries and some years based on other available data.

1. Unweighted average of available OECD countries.

2. Unweighted average of Czech Republic, Hungary, Latvia, Lithuania, Poland, Slovak Republic, and Slovenia.

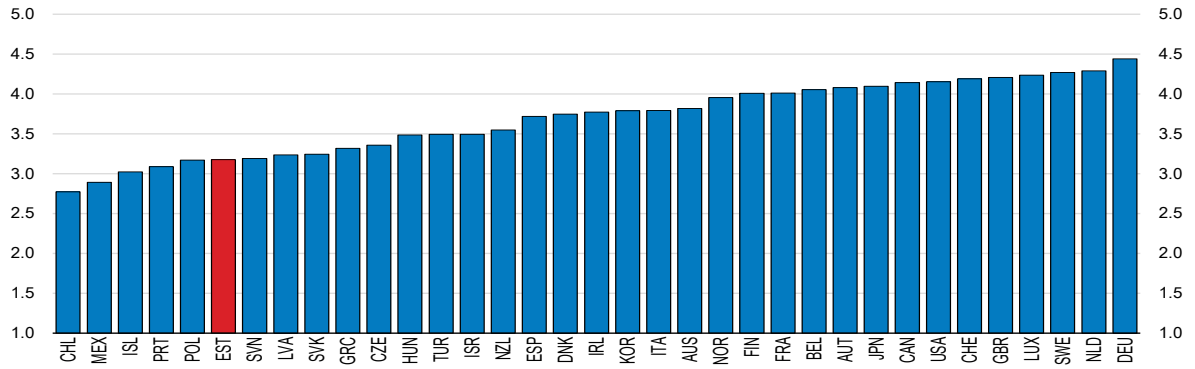
Source: ITF Transport statistics.

Nevertheless, weaknesses persist in some areas. Estonia fares worse than other CEE countries with respect to the quality of logistics infrastructure (Figure 22). This partly reflects the operational constraints at border crossings for rail transport to Central Europe and the lack of intermodal terminals for combined transport (Hilmola and Henttu, 2015). By connecting Estonia with the European Core Network, the construction of the Rail Baltica corridor – to be completed by 2030 – will partly resolve these issues.

Indicators capturing the satisfaction of business users and shippers – the Global Competitiveness Index and the Logistics Performance Index – highlight remaining gaps in infrastructure quality compared with the best-performing countries. In the air-cargo sector, Estonia ranks poorly both generally in terms of legal and customs-related capacity to handle international shipments and to undertake electronic transactions. This is unfortunate, as smooth international shipments and air freight competitiveness both play a critical role in facilitating export trade.

Figure 22. The quality of logistics infrastructure is poor

Quality of logistics infrastructure score, from 1 (lowest score) to 5 (highest score), 2016-17



Source: World Bank, Logistics Performance Index database 2016 (LPI).

Finally, satisfaction with the quality of roads is well below that in Western European countries, and the national Road Administration estimates that 30% of roads are in bad or very bad condition (EBRD, 2016b). Estonia's achievements in improving its road safety record have slowed in recent years. The lack of adequate maintenance activities partly explains these outcomes, in particular for secondary roads in remote areas. The need for increased maintenance has to translate into adequate budgetary provisions to ensure high standards of service.

Improving management of infrastructure projects

Financing infrastructure could be an issue in the long run

High utilisation with sufficient revenue generation is a premise of sustainable network funding. In the transport sector, changing trade flows and lower economic growth have resulted in overcapacity and a fall in revenues from the exploitation of the freight infrastructure (Box 2). For instance, the state-owned railway infrastructure company, Estonian Railways, saw losses deepen from EUR 6.3 million in 2015 to EUR 10.8 million in 2016.

Railways and ports need to attract new traffic flows and new markets such as container transport. Rail links between Muuga (the largest port) and Rail Baltica lines from 2020, as well as government support to attract exporting companies to locate at industrial areas around ports, should help in this regard. Coordinated plans for port modernisation and for the development of logistics terminals would be a natural complement to these developments.

Increasing revenues drawn from user fees can enhance Estonia's ability to maintain quality and safety standards and reduce the risk of underfunding over the next few years. Consideration should be given to setting up new funding arrangements: for instance, the fee for kilometres covered could be applied to both passenger and freight trains and road users could be charged for the use of motorways.

Operational costs could also be reduced by involving the private sector more in the management and maintenance of infrastructure. The Road Administration has introduced performance-based contracts for road maintenance, leading to an average cost saving of 10% between 2015 and 2016. Consideration should be given to extending long-term contracts for infrastructure management and services based on tenders in other segments of the transport sector.

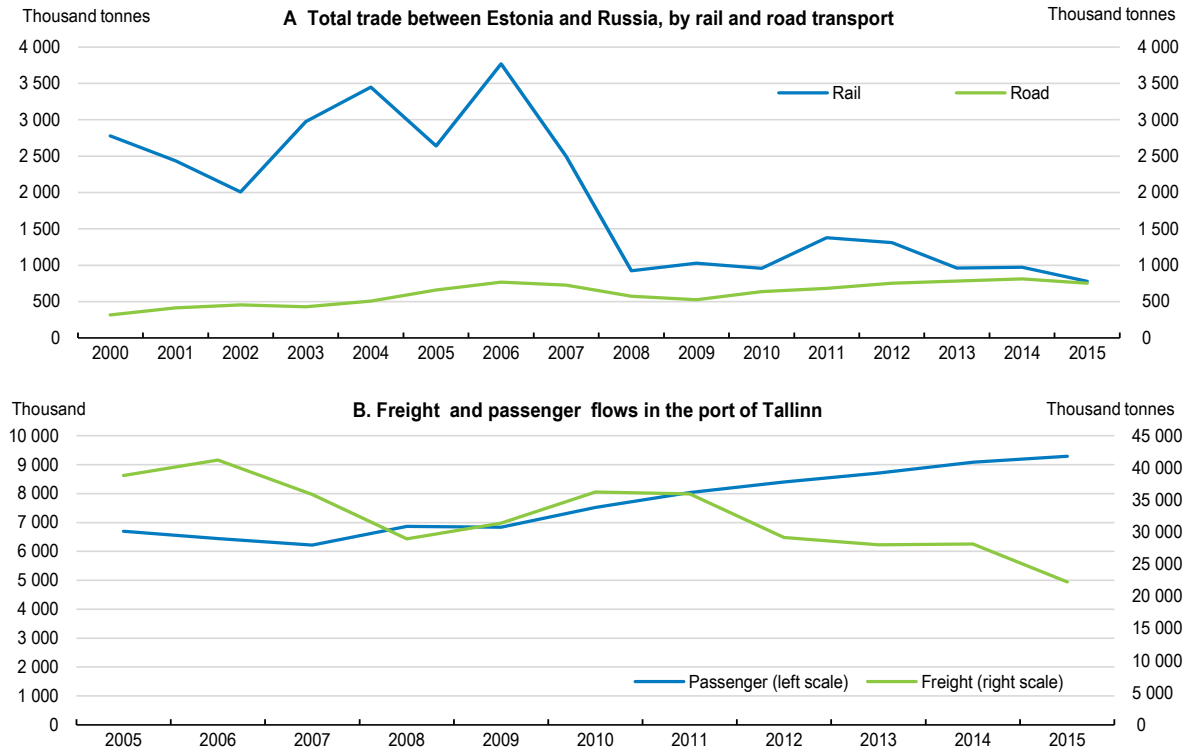
Contractual relationships should be carefully designed to allow efficient risk-sharing between the public and private sector. This has not been systematically done in Estonia. For instance, conditions for the management and the maintenance of the basic broadband network have not been properly defined and are binding for five to seven years only, creating uncertainty about the costs of maintaining ICT infrastructure. As a result, the National Audit Office recommended redefining both requirements and obligations in the management of the basic broadband network throughout its lifetime, in consultation with the network's developers and managers (National Audit Office, 2015b).

Box 2. Capacity utilisation in rail and ports

Russia has traditionally been one of Estonia's main trading partners. Estonia's rail and road networks carry a large share of cargo in transit from Russia to the rest of Europe, mostly liquid bulk, often feeding into Estonian ports. Over the past decade, Russia has reduced cargo flows via the Baltic States in an effort to develop its national ports. Lower growth rates and the depreciation of the rouble have also contributed to a decline in economic activity in the Estonian transport sector. The corresponding decline in goods carried by Estonian railways since 2006 has been sharp (Figure 23, Panel A); transit freight, which constituted a large share of cross-border traffic, has declined by 70% over this period.

The change in trade flows requires a reassessment of infrastructure needs in ports. Terminals at Estonian ports have been developed to carry predominantly liquid bulk. Container traffic has already grown by 70% between 2006 and 2015, partly compensating the decline in liquid bulk, and passenger numbers have increased (Figure 23, Panel B); these trends should continue in the coming years.

Figure 23. Freight flows have declined



Source : Eurostat

Identifying priority areas

The efficiency and productivity of public investment could be significantly enhanced by improvements in its management. A recent IMF paper shows that countries whose institutions have stronger public investment management have more predictable, credible, and efficient investments, and that strengthening these institutions could close up to two-thirds of the public investment efficiency gap (IMF, 2015). In particular, good coordination in investment planning and a clear system for the selection and prioritisation of projects is indispensable to identifying strategic priorities and exploiting synergies across investment programmes. Establishing a national supervisory authority in charge of evaluating investment projects such as the Dutch CPB could help in this regard. In addition, to maximise the social return of investment, the impact on regional development, the environment and safety should systematically be taken into account, and a reliable ex-ante assessment of rates of return be carried out.

The absence of a coherent framework to assess the value-for-money and socio-economic impacts of planned investment makes it challenging to correctly identify and prioritise the most productive infrastructure projects in Estonia. As regards transport infrastructure, the National Transport Development Plan 2014-2020 identifies the main issues affecting transport competitiveness and proposes solutions to each of them, but it fails to establish clear priority. For instance, two policy initiatives for road maintenance compete for the same budget: on one hand, the Plan highlights the need to raise maintenance standards through more and better-targeted expenditures, but on the other hand, the Plan introduces a "Dust-free Estonian roads by 2030" programme which consists in lower-cost pavements across all gravel roads. The expected costs and benefits of each policy measure are neither detailed nor compared.

A sound and coherent methodology needs to be developed to assess the socio-economic impacts of infrastructure development projects and guide decision-making. In Estonia, cost benefit analyses are not compulsory for all large-scale projects. Apart from those co-funded by the EU, most projects are compiled and reviewed periodically by a steering committee composed of public sector officials. Cost-benefit analysis (CBA) should be used for all substantial investment in infrastructure. Underpinned by good data, such analysis is particularly useful in preventing cost overruns and over-estimation of future demand. It has been effective at heightening the level of scrutiny around infrastructure projects in countries including the UK, France, Korea, and Denmark (ITF/OECD, 2017).

The quality of CBA in Estonia, notably the precision of forecasting, has recently come into question. In the road sector, traffic growth and time saving induced by investment have been over-estimated, calling for improving ex-ante project evaluation (Praxis, 2017). The selection criteria of future projects should include the maintenance cost and the environmental impact of developing the transport network further. A uniform methodology and strict guidelines for CBA should be established, as done for instance in Denmark.

Finally, while the need for more coordination among different stakeholders is identified in strategic documents (for instance in the National Transport Development Plan 2014-2020), concrete measures to achieve this goal are not implemented. In the transport sector, there is potential to enhance coordination at the level of strategic planning by merging different administrations under a national transport agency, as done in Sweden or Finland. A national transport model can be used to simulate the impact of proposed transport projects across all modes, as done in most other European countries (Lundqvist and Mattsson, 2002). Participation in international benchmarking studies (e.g. the International Traffic Safety Data and Analysis Group, a forum for knowledge transfer on road safety) can also be useful for exchange on best practices.

Supporting green investment

Estonia has the most carbon-intensive and the third most energy-intensive economy in the OECD, with pockets of very high pollution. Transitioning to a low-carbon and resource-efficient economy will

require significant investment; consequently, as in other OECD countries, public and private sources of capital will need to be mobilised on a much larger scale than before (OECD, 2017c). Expensive remediation of old contaminated sites inherited from the Soviet period is also a priority (OECD, 2017a).

Greening the electricity sector

The electricity sector, dominated by the oil shale industry, is a large emitter of carbon and other pollution. Exploitation of oil shale generates nearly 98% of total hazardous waste, of which Estonia has 35 times more per capita than the EU average. Worryingly, waste disposal creates air and water pollution, with measurable consequences for the health of the local population (OECD, 2017a).

While large investments have been made to decrease direct emissions from oil shale-based energy production, competitiveness of the oil shale industry is likely to erode in the medium term as the costs of oil shale processing are set to grow with the price of CO_2 emissions and the cost of extraction. Open quarries get depleted and extraction shifts to more expensive and less efficient underground mining. Also, continued reliance on oil shale risks leading to a greenhouse gas emissions trajectory inconsistent with the long-term aims of the Paris Agreement (OECD, 2017a).

The *National Development Plan of the Energy Sector until 2030* defines policy objectives of diversifying the energy mix and more specifically of moving to a more environment-friendly electricity production. However, details on how to reach these objectives have not yet been elaborated and too few initiatives have been taken to encourage pollution mitigation and resource efficiency in the oil shale industry over the past few years (OECD, 2017a). Recent reform of the extraction tax to take account of the actual value of the resource extracted has even reduced the impact of taxation, by cutting its rate more than five-fold until the end of 2017. Setting up effective incentives for green investment in the oil shale industry is urgent, as three quarters of production facilities are set to be replaced in the coming years.

Deeper integration in the European energy markets is a central element of a transition to a low-carbon electricity supply, as it fosters competition on the energy market and improves access to cleaner resources. Estonia's integration into the Nord Pool electricity market was achieved in 2014 and the third Estonian-Latvian power connection needed for full integration in the Continental European Market is progressing well. Though Russia was the sole gas supplier in Estonia until recently, gas is now also imported from the Klaipeda liquefied natural gas terminal in Lithuania. Two infrastructure projects will contribute to diversifying the source of gas supply further: a gas connection between Poland and Lithuania, and a gas pipeline between Estonia and Finland.

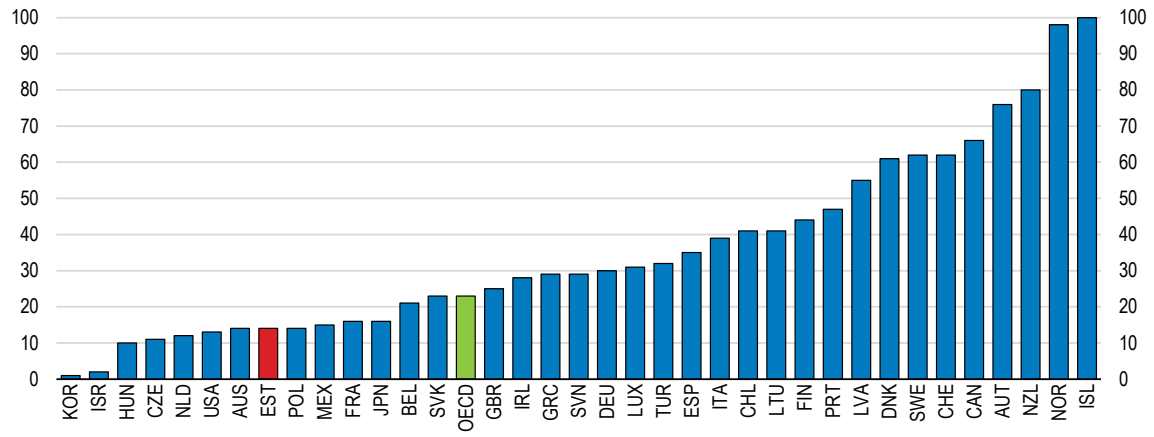
Developing renewable energy sources

Expanding the use of energy from renewable sources is also part of Estonia's strategy for greening electricity supply. The *National Development Plan of the Energy Sector until 2030* set the targets of 50% of renewables in total energy consumption and 50% in electricity consumption for 2030. The share of renewables is close to the OECD average for total energy supply, primarily through the use of biomass for heating. By contrast, the use of renewable energy sources in the electricity sector is among the lowest in the OECD, as 80% of electricity is produced from oil shale (Figure 24).

To reach the 2030 target, the government is considering introducing an auction mechanism, i.e. issuing a call for the installation of a certain amount of renewable capacity. Such a system, also used in Germany or the UK, would allow for control to be kept over renewable energy capacity and its costs, while choosing the lowest-cost options. This should also create a stable and predictable policy environment for investment in clean electricity generation. This is critical as long-term investment in green electricity is undermined by uncertainty regarding the level of energy and carbon prices, but also by the lack of predictability of public support (OECD, 2015b).

Figure 24. The share of renewables in electricity is low

Share of renewable sources in electricity generation, 2015, %



Source: IEA World Energy Statistics and Balances.

Developing electricity production from renewables will also require investment to ensure reliability of electricity provision at a reasonable cost (IRENA, 2017). The electricity transmission and distribution network will have to be expanded to transport electricity from decentralised sources which are not located close to demand (e.g. off-shore wind). In addition, to adapt the network to intermittent energy supply, policy makers will have to incentivise investment in technologies that enable the smoothing of energy demand (smart meters, storage capacity), more efficient allocation of power around the network (smart grids) or the generation of power at a relatively low cost when renewables falter. This will be challenging, as expansion of power generation capacity should push electricity prices down and reduce revenues earned by utilities on wholesale power markets, thereby deterring private investment. A review of the electricity market should be carried out to identify if support for investment in conventional power will be needed to maintain reliability, and to identify what market structure would best support this transition at a reasonable cost.

Fostering the decarbonisation of transport

Increasing car taxation

Road transport accounts for a large and rising source of air pollution and carbon emissions in Estonia. Passenger cars have the highest carbon emission rate in the EU and a low energy efficiency profile (European Commission, 2016a). Estonia is unusual among OECD countries in that it has no specific tax on car purchases. Taxation of motor vehicles is low, accounting for only 2.5% of environmentally related tax revenues, well below the OECD average. Low vehicle taxes tend to encourage the use of cars and reduce incentives for using alternative transportation modes (e.g. rail, public transportation).

The government plans to introduce a road charging system for heavy duty vehicles, a system that already exists in most EU countries. Estonia could go further by introducing a road pricing system for all motor vehicles and by phasing out subsidies for company cars. In addition, introducing motor vehicle taxes reflecting the environmental characteristics of each vehicle (fuel efficiency, carbon emission, and air pollution) can provide incentives to switch to less polluting vehicles and transportation modes.

Improve consistency of national policies for the decarbonisation of transport

Contradictory policy choices have slowed the decarbonisation of transport. Support of the electrification of the car fleet has been suspended since 2015. The Electro-Mobility Programme, including the development of a fast-charging network and a generous electric car-purchase subsidy scheme (around EUR 15 000 per car), has not delivered the expected outcomes: the uptake of clean passenger vehicles was lower than planned and only around 1 000 cars were put into circulation. Better allocation of available and limited resources would have allowed maintaining financial support over a longer period and ensuring positive returns on past investments.

However, policy objectives changed with plans for shifting vehicles from fossil fuels to bio-methane. The government foresees building an Estonia-wide network of filing stations by 2018 and increasing production of bio-methane nationally. Vehicles are expected to switch to bio-methane over time, starting from buses, with operators being subsidised to renew their fleets. More coherence, stability and predictability in the policy framework are needed to foster private investment and lower the cost of achieving objectives for the decarbonisation of transport.

Increasing financial incentives for green investment

Green investment has gained momentum in Estonia over the past decade. Production companies more than doubled pollution abatement expenditure between 2010 and 2013, of which 70% was investment (OECD, 2017a). According to the EU-28 Eco-innovation scoreboard, a relatively high proportion of companies have implemented measures to increase material productivity (Eco-Innovation Observatory, 2016). At the same time, proportionately fewer companies have implemented innovative activities to reduce energy input than in the EU on average. Also, firms tend to invest more to reduce pollution already generated (end-of-pipe technologies) than to reduce pollution generated in the production process (process-integrated technologies) (OECD, 2017a). Compliance with EU environmental standards has been the main driving force of these investments.

Investment needed to reduce environmental damage generated by economic activity is lacking partly because financial incentives, in particular environmentally-related taxation, remain too low to deter environmentally harmful behaviour. Despite considerable increases in the tax rates on some pollutants since 2000, taxes or charges on a large number of pollutants remain below their abatement costs. For some water pollutants, however, strong marginal incentives exist: polluters pay a reduced rate if their discharges remain below permitted limits but may be liable to non-compliance fees of up to 100 times the basic rate if they exceed those limits.

Some rationalisation of financial incentives could help to increase incentives to reduce pollution, including by applying tax rates reflecting the actual level of the negative environmental cost. For the action on climate change to be more effective, the effective cost of CO_2 emissions needs to be increased almost across the board as it is low in most sectors of the economy, including the oil shale industry. Sectors where CO_2 emissions are not priced at all should also be included in carbon pricing (OECD, 2016). If higher environmental taxes were to hit competitiveness, this negative impact could be moderated by supporting the threatened industries, while maintaining the incentive for pollution abatement. Such measures should be transitional and supported by sufficient empirical evidence of competitiveness losses.

Policies should ensure that, where taxes are applied, the related pollution is measured effectively. Environmental impact is estimated based on self-reporting data, and compliance monitoring appears insufficient (National Audit Office, 2015c). As recommended in the recent Estonia *Environmental Performance Review*, standard monitoring and reporting procedures and more diligent verification of companies' self-reporting data by the Environmental Inspectorate should be established (OECD, 2017a). Also, in cases of violation of environmental regulation, the level of monetary penalties does not depend on

the gravity of the offense and the economic benefit of non-compliance (OECD, 2017a). Increasing sanctions should lead to investment decisions that internalise the cost of pollution.

Improving effectiveness of public programmes

Green investment has been supported by public programmes conducted by the Environmental Investment Centre. Financial resources allocated to these programmes are rather precarious as they stem from EU funds, the sale of excess carbon credits, and environmental pollution and resource taxes. The budget of the Environmental Investment Centre declined from EUR 35.8 million to EUR 25.6 million between 2012 and 2017 as revenues from extraction charges paid by the oil shale industry and EU environment-dedicated funds decreased.

The effectiveness of subsidised investments is uncertain as evaluation of projects is not systematically carried out. Questions remain about whether the projects would have been made without support, and about the resulting windfall gains. Carrying out evaluation of support measures in a thorough, independent and transparent manner would help to make current instruments more efficient and identify where further efforts are needed.

Also, private financing of green investment could be better supported to reduce the need for public programmes. For instance, Energy Performance Contracting used in other OECD countries to finance energy efficiency investment, are underdeveloped in Estonia. Energy Performance Contracting allows the provision and maintenance of energy-efficient equipment to be financed by subsequent energy savings. Under some contracts, Energy Service Companies can also finance or arrange financing for the operation. This market did not take off in Estonia because of generous public support, including public grants and soft loans for energy efficiency. Also, relevant regulation and information about energy services are missing (Bertoldi et al., 2014). Areas where public programmes supporting energy efficiency investments can be replaced by market instruments should be identified and barriers to the development of such instruments removed.

Box 3. Recommendations to revive productive investment

Further strengthening the business environment

Key recommendation:

- To increase credit recovery and shorten insolvency procedures, allow creditors to initiate restructuring; introduce early warning mechanisms, such as one-line insolvency tests, and develop options for out-of-court settlements.

Other recommendations:

- Strengthen incentives for creditors to invest in business restructuring by ensuring new investors are paid before unsecured creditors in the event of liquidation. Limit the period during which debt-collection is stopped.
- Establish a bankruptcy ombudsman to strengthen incentives for company managers and owners to file for bankruptcy early.
- Continue efforts to reduce red tape and eliminate remaining regulatory barriers to service business.
- Simplify the issuance of permits for business with low environmental impact.

Improving access to finance

Key recommendation:

- To foster competition in the financial sector, create a centralised credit bureau that will collect both positive and negative information on creditors.

Other recommendations:

- To develop new sources of financing, increase protection of investors using Fintech platforms by

introducing licencing requirements. Provide more information about financial innovation and the related risks.

Addressing skill shortages

Key recommendations:

- Reduce the gender participation gap by extending the share of parental leave reserved for fathers.
- To reinforce the quality of adult education, strengthen the monitoring of training courses by using ex- post evaluation of training, including labour market outcomes of participants.
- Extend the accreditation system to all publicly funded learning programmes to signal and improve their quality.

Other recommendation:

- Improve career guidance services after lower-secondary education.

Improving infrastructure and green investment

Key recommendations:

- Set tax rates on oil shale, vehicle and energy use at a level that better reflects the environmental damage they generate.
- Carry out *ex ante* cost-benefit analyses for all large-scale infrastructure projects based on a uniform methodology.

Other recommendations:

- Continue efforts to improve logistics infrastructure in particular intermodal connections.
- Ensure long-term funding for infrastructure investment. Draw more revenues from user fees and set appropriate road prices.
- Establish a national supervisory authority in charge of the selection and the design of investment projects.
- Extend the road pricing system to all motor vehicles, phase out subsidies for company cars, and introduce a car registration fee reflecting the environmental characteristics of vehicles.
- Support the deployment of renewable energy sources through competitive tendering as planned.
- Align the level of monetary penalties for environmental violations on the gravity of the offense.
- Identify areas where public programmes supporting energy efficiency investments can be replaced by market instruments, such as Energy Performance Contracting, and remove barriers to the development of such instruments.

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