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Estonia: Raising Productivity and Benefitting more from Openness

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ESTONIA: RAISING PRODUCTIVITY AND BENEFITTING MORE FROM OPENNESS

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By Andreas Kappeler

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ABSTRACT/RÉSUMÉ

Estonia: Raising productivity and benefitting more from openness

Estonia can revitalise productivity growth and reap more benefits from its openness. Productivity is relatively low in manufacturing and in large firms, as the manufacturing sector focuses on low-technology goods exports to only a small number of destinations. The economic impact of the Estonian R&D system still appears to be limited, also because of a lack of knowledge transfer. Building on Estonia's favourable business environment, productivity growth could be raised by promoting smart specialisation and innovation; removing remaining barriers to entrepreneurship and competition; ensuring access to finance for SMEs; upgrading infrastructure; and improving energy efficiency.

This Working Paper relates to the *2014 OECD Economic Survey* (www.oecd.org/eco/surveys/economic-survey-estonia.htm).

JEL Classification: F43, O38, O52.

Keywords: Productivity, innovation, knowledge transfer, infrastructure, energy efficiency.

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Estonie : accroître la productivité et tirer davantage parti de l'ouverture de l'économie

L'Estonie peut dynamiser la croissance de sa productivité et tirer davantage parti de l'ouverture de son économie. La productivité est relativement faible dans le secteur manufacturier et dans les grandes entreprises, car l'activité manufacturière est orientée essentiellement vers les exportations de biens à faible intensité technologique à destination d'un petit nombre de marchés. L'impact économique du système de R-D de l'Estonie semble encore limité, en raison pour partie de l'insuffisance des transferts de connaissances. Le pays offrant des conditions favorables à l'activité d'entreprise, la croissance de la productivité pourrait être renforcée en favorisant l'innovation et la spécialisation intelligente ; en supprimant les facteurs qui entravent encore l'entrepreneuriat et la concurrence ; en faisant en sorte que les PME aient accès à des financements ; en rénovant l'infrastructure ; et en améliorant l'efficacité énergétique.

Ce document de travail se rapporte à l'*Étude économique de l'OCDE 2014 sur Estonie* (www.oecd.org/fr/eco/etudes/etude-economique-estonie.htm).

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Mots clefs: Productivité, innovation, transferts de connaissances, infrastructure, efficacité énergétique.

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Estonia: Raising Productivity and Benefitting more from Openness

By Andreas Kappeler¹

Modest productivity growth slows income convergence

1. Estonia has a large productivity catch-up potential. Although GDP per hour worked and incomes are considerably lower than in most OECD countries, labour productivity growth has slowed down since 2008 and is now in line with average productivity growth across OECD countries (Figure 1). Measuring productivity at the sectoral level is difficult. OECD data suggest that productivity has weakened in the services (Figure 2) more than in other OECD countries and is broad-based, extending to professional, financial and information services and, to some extent, wholesale and retail trade (OECD, 2013c). Labour productivity growth in manufacturing has held up, but over the past 15 years, productivity gains have been smaller than in some other countries with similar or higher income levels, such as the Slovak or Czech Republics. In construction, productivity growth increased, mainly because employment declined massively.

Figure 1. Evolution of productivity

Source: OECD Productivity Database.

1. Andreas Kappeler is an economist on the Estonia/Germany Desk in the Economics Department of the OECD. This paper was originally produced for the 2015 OECD Economic Survey of Estonia. It was published as chapter one of this Survey under the authority of the Economic and Development Review Committee (EDRC) in January 2015. The author would like to thank Álvaro Pereira, Robert Ford and Andreas Wörgötter for valuable comments on earlier drafts. This working paper also benefitted substantially from comprehensive comments from and many discussions with Andrés Fuentes Hutfilter. Special thanks go to Seung-Hee Koh and Eun Jung Kim for technical assistance and Heloise Wickramanayake for technical preparation.

Figure 2. Contribution to growth in real business sector value added per hour worked

Source: OECD Productivity Database.

2. Productivity levels are especially low among big firms (Figure 3). Many of them are manufacturing firms, which often focus on low technology exports in a small number of varieties that are easy to imitate. Also, their innovation activity is limited (Benkovskis and Rimgailaite, 2011; *Economic Survey of Estonia* 2011, OECD, 2011f). Productivity and R&D activity is also fairly low among small firms (OECD, 2013b). Small firms are internationally oriented, which may open the door to higher productivity in the future. The share of fast growing innovative firms is the 9th highest in a sample of 18 OECD countries (OECD, 2014d).

Figure 3. Labour productivity levels by enterprise size, total economy

Source: OECD (2014), Entrepreneurship at a Glance.

Openness and high value added foreign direct investment boost productivity and innovation

3. For a small economy, openness is a key source of income convergence. It provides small fast growing firms with access to foreign markets and is a source of knowledge transfer (Andrews and

Westmore, 2014). Estonia is one of the most open economies in the world, with exports and imports each about 90% of GDP. However, exports are concentrated in low and medium technological goods and appear to be comparatively un-diversified geographically (*Economic Survey of Estonia 2012*, OECD, 2012c). Only 2% of enterprises have more than 14 export destinations. Evidence suggests that Estonian firms expanding their export activity are often more productive than those keeping their export mix unchanged or decreasing its breadth (Masso and Vahter, 2014).

4. Foreign direct investment (FDI) inflows in high value added activities entail considerable long-term benefits (Vahter, 2011). FDI entails a considerable potential for transfer of knowledge, especially for a small economy with a large productivity gap, such as Estonia (OECD, 2008b). Estonia's inward FDI stock is large, accounting for roughly 90% of GDP in 2012. However, a large share of inward FDI flows is directed towards financial intermediation. Inward FDI directed towards manufacturing is low (Figure 4) and concentrated on low-value added manufacturing goods (Masso et al., 2010). This is also reflected in a low participation in global value chains compared to other small open economies (OECD, 2013a).

Figure 4. Foreign direct investment inflows by sector

Source: Estonian Central Bank.

5. Structural reforms can help to reap more benefits from Estonia's openness and strengthen growth. Continued efforts are needed to promote smart specialisation and innovation; remove remaining barriers to entrepreneurship and competition; ensure access to finance for SMEs; upgrade infrastructure; and raise energy efficiency, as discussed below.

Reaping more benefits from innovation

6. Estonia scores well on innovation activity, low productivity growth notwithstanding. R&D spending in Estonia has increased considerably in recent years, to 2.2% of GDP in 2012 (Figure 5). This increase may well result in improved productivity and competitiveness in the future (Andrews and Westmore, 2014). However, the remarkable growth in R&D in 2010 and 2011 was partly the result of considerable one-off investments in the oil shale industry. R&D spending by the government, non-profit organisations and, to some extent, businesses increased in 2012 (Statistics Estonia, 2013). Services are active in business R&D and the share of young enterprises is comparatively large (OECD, 2012b; OECD, 2014d), especially in the ICT sector where Estonia has developed a marked comparative advantage (OECD, 2013b; OECD, 2012a). Manufacturing is characterised by relatively low R&D spending and a low share of young enterprises (OECD, 2014d). This reflects the focus of manufacturing on low technological

goods in a small number of varieties that are easy to imitate and are most often unprotected by patents (Benkovskis and Rimgailaite, 2011; *Economic Survey of Estonia 2012*, OECD, 2012c).

Figure 5. R&D spending

Source: Eurostat.

7. The economic impact of the Estonian R&D system appears to have been limited so far (European Commission, 2013d; National Audit Office of Estonia, 2013a; National Audit Office of Estonia, 2014a), which has prompted reforms by the government. Exports of medium and high-tech products; licence and patent revenues from selling technologies; and sales of new products are low (European Commission, 2014a; OECD, 2014c). One reason is that R&D policies have been fragmented and have duplicated support (European Commission, 2010; European Research Area Committee, 2012).

8. Estonia's smart specialisation strategy is at the core of its efforts to reap more benefits from innovation, and thereby revitalise convergence of GDP per capita and productivity (Box 1). The strategy identifies ICT, healthcare and resource efficiency as having the greatest potential to create added value in the future in Estonia. For instance, in the ICT sector there is scope to diversify from the provision of services more towards the development of manufacturing goods, though that would require higher upfront investment (Estonian Development Fund, 2013). Smart specialisation is considered a useful regional policy framework for innovation driven growth. However, in Estonia, there seems to be scope to implement the smart specialisation strategy more effectively and raise its economic impact by enhancing framework conditions. Also, a particular focus should be put on promoting transfer of knowledge and enhancing management skills in the private sector, as discussed below.

Box 1. Smart specialisation and its implementation in Estonia

Smart specialisation is a policy framework combining industrial, educational and innovation policies (including their design, implementation and evaluation) to promote new growth opportunities. Countries or regions should identify and select a limited number of priority areas for knowledge-based investments. Thereby they should account for: regions' comparative advantages; effective use of public resources; creating synergies between public and private innovation efforts; and evidence-based monitoring and evaluation. Recognising the lack of information at the aggregate level, smart specialisation rests on an interactive bottom-up approach involving all stakeholders, including the private sector, scientists and all levels of government. This process defined as “entrepreneurial discovery” distinguishes smart specialisation from traditional industrial and innovation policies (OECD, 2013f). Specialising smart, by allowing resources to allocate flexibly towards their most effective use, is becoming even more important in a fast changing globalised world (Johansson and Olaberria, 2014; Johansson and Nicoletti, 2014).

Estonia has developed its own smart specialisation strategy. The *Estonian Entrepreneurship Growth Strategy 2014–20* is Estonia's third strategy on research and development and innovation (MER/MEAC, 2014; Ministry of Economic Affairs and Communications, 2013). The previous strategies focused primarily on developing Estonia's capability in research, development and innovation. Instead, the new strategy aims at enhancing the impact of research, development and innovation on economic growth. The development of priorities is supported by a regional development strategy determining regional sectors with growth potential. In numerical terms, the aim is to increase private R&D spending to 2% of GDP, raising the share of Estonia's exports in world trade to 0.11% and labour productivity to 80% of the EU average by 2020. The strategy lists three areas where co-operation between businesses and researchers has the greatest potential to create added value: information and communication technology; healthcare technologies and services; and more efficient use of resources.

Besides ministries and different levels of government, the following institutions are involved in implementing the smart specialisation strategy:

- Estonian Development Fund - carries out development surveillance necessary for long-term policy making and direct investment of venture capital until the launch of the national venture capital fund.
- KredEx Foundation - offers different financial instruments, including loans, credit insurance and state guarantees. It will soon start to manage a venture capital fund of funds.
- KredEx Credit Insurance Foundation - a state owned insurance company that helps Estonian enterprises to mitigate risks related to exports and domestic sales.
- Enterprise Estonia - one of the largest institutions within the national support system for entrepreneurship, providing financial assistance, counselling, cooperation opportunities and training for entrepreneurs, research institutions, the public and non-profit sectors.
- Innovation and Enterprise Policy Committee - advises the Ministry of Economic Affairs and Communications on the development and implementation of policies.

Enhancing framework conditions for innovation

9. The main responsibility for innovation strategy and implementation is shared by the Ministry of Education and Research and the Ministry of Economic Affairs and Communications. Coordination and collaboration between the two ministries was strengthened within the new innovation strategy (MER/MEAC, 2014). Effective innovation policy also requires close co-operation with private actors who are often better placed than governments to identify barriers to innovation or policy action (OECD/WB, 2014). Accordingly, Estonia set up a Steering Committee, which includes representatives from different ministries, industry and academia. To ensure effectiveness, such inter-ministerial working groups should be held accountable and their performance reviewed regularly. Collaboration on innovation could be

strengthened further, for instance by promoting horizontal ways of working across ministries (OECD, 2011b). This also applies to innovation measures that require cross-ministerial finance decisions (National Audit Office of Estonia, 2014a). Promoting effective collaboration among ministries may also be beneficial to promote energy efficiency, where research and development is key to improved performance (see below).

10. There are concerns that entrepreneurs and civil society organisations are not sufficiently represented in the political decision process (European Research Area Committee, 2012; European Commission, 2013b; OECD, 2013f). Private sector participation and rights to petition the government for information have improved considerably but remain below those of innovation leaders such as the Nordic countries (Figure 6). More can be done to hold public institutions accountable between elections and thereby enhance transparency; also, more opportunities for citizens' engagement in the policy-making process can be provided (OECD, 2014e). Moreover, business sector representatives have argued that notification periods about changes in laws and regulation are often short in practice.

Figure 6. Level of public participation and right to petition the government

Source: The World Justice Project (2014), WJP Rule of Law Index 2014.

11. A number of OECD countries introduced independent productivity commissions that act as review and advisory bodies on microeconomic policy reform and regulation with the aim of achieving better informed policy decisions through independent, published analysis and advice (OECD, 2013i). For instance, in the Netherlands a Council of Chief Economists meets every month to discuss policy initiatives and outcomes. The Australian Productivity Commission played an important role in boosting the productivity performance of the Australian economy in the sixties and seventies. New Zealand and Norway have established a similar institution more recently. Denmark set up an independent standing productivity commission with a life of two years in 2012. The benefit of such a cross-cutting institution in Estonia could be to gain a better understanding of the factors behind the slow and volatile convergence, despite overall good framework conditions.

12. There seems to be scope to improve the responsibilities and corporate governance of public bodies implementing innovation policies (European Commission, 2013d). Board members were replaced repeatedly in 2014 upon strong political pressure in Enterprise Estonia, one of the largest institutions within the national support system for entrepreneurship (see Box 1). Also, overlapping activities may reduce effectiveness and accountability. Some innovation instruments are duplicated by multiple institutions, which may result in large administration overheads and reduce their impact (European

Research Area Committee, 2012). Against this backdrop, the scope to enhance the corporate governance of implementing institutions and make them more independent from the government should be reviewed. This would also strengthen the capacity of these institutions to get more involved in evidence-based policy development (OECD, 2011b).

13. Considerable effort has been made in recent years to improve evaluation of innovation policies (OECD, 2013f). Evaluation has become more independent from the Ministry of Economic Affairs and Communication. Effective design and implementation of innovation policies also requires constant experimentation, monitoring and adaptation (OECD/WB, 2014). In practice this means to experiment with new policy instruments on a small scale, to evaluate them thoroughly and, if proving effective, apply them on a larger scale. Evaluation should already be incorporated at the design stage. Pilot projects should test the practical feasibility of new research and innovation instruments and their potential to promote smart specialisation. This could also serve to reassess the effectiveness of existing innovation support instruments and whether they crowd out private innovation spending (Andrews and Criscuolo, 2013).

14. Estonia also applies regulatory impact assessments on a sectoral basis, following OECD best practice. A regulatory impact assessment identifies and quantifies benefits and costs of a proposed regulation if adopted. The focus of Estonia's regulatory impact assessments is on reducing administrative burdens. In general, the trade and investment impacts of new regulations are only assessed for legislation which is drafted at EU level and affects external trade. In other cases, the approach may overlook negative implications of regulation for trade and investment (OECD, 2011a).

Promoting knowledge transfer between private and public institutions

15. R&D collaboration of firms across borders is comparatively widespread in Estonia (OECD, 2013b). However, international collaboration of firms seems to result in only limited transfer of knowledge (European Research Area Committee, 2012). Moreover, the share of firms collaborating on innovation with higher education and government research institutions is low, especially among SMEs (Figure 7; European Commission, 2014a; European Commission, 2013d). One reason may be that Estonia has few universities and research institutions and that collaboration with research units abroad is difficult. There is scope to focus university research more towards applied research and areas identified in Estonia's smart specialisation strategy and to strengthen collaboration of universities with domestic firms. At the same time, keeping a balance between basic and applied research is key for future innovation and for new growth areas to emerge. Further efforts are also needed to promote collaboration of firms and universities with applied research institutes, including from abroad, such as VTT in Finland and Fraunhofer in Germany. Government support dedicated to fostering international collaboration is low (MER/MEAC, 2014).

Figure 7. Collaboration of firms on innovation with higher education or public research

Source: OECD (2013), OECD Science, Technology and Industry Scoreboard.

16. The government should continue to move ahead with the open data initiative (European Commission, 2013c). Making publicly collected statistical information available more widely potentially increases government transparency and public awareness of government programmes and activities. It also helps to generate insights into how to improve government performance. Increased data transparency may provide new ways of collaboration among government and research institutions on R&D policies and collaboration in the creation of innovative, value-added public services (Ubaldi, 2013). The potential of the open data initiative is particularly large in Estonia due to its leading role in e-governance. When implementing the open data initiative, it should be ensured that technical, legal and financial restrictions do not limit data accessibility and reusability (Ubaldi, 2013).

Promoting managerial and entrepreneurial skills

17. Limited economic outcomes of international collaboration may reflect a limited capacity of local firms to absorb knowledge from collaboration with foreign affiliates (UNCTAD, 2011). Managerial and entrepreneurial skills are important for putting innovative ideas into practice and enabling organisations to adapt in competitive environments as well as absorb technological knowledge from abroad (Andrews and Westmore, 2014; OECD, 2011e). Estonia suffers from a lack of managerial skills needed to grow and internationalise a business (European Commission, 2013b; Andrews and Westmore, 2014). The aim of the smart specialisation strategy to strengthen the development of management competencies and long-term planning in enterprises is welcome (Ministry of Economic Affairs and Communications, 2013). Promoting international and applied management skills could be particularly beneficial given the size of the economy. This also requires competition among firms and limiting management structures that tend to be less successful, such as family owned firms managed by family members (Andrews and Westmore, 2014). There is also scope to enhance teaching at school of how to run a business. School education in entrepreneurship is weaker in Estonia than in most other OECD countries (OECD, 2013h). Early exposure to managerial and entrepreneurial skills has considerable long-term benefits (OECD, 2011e).

18. The government's "e-residence initiative" is a promising step to strengthen the country's international profile. E-residence facilitates persons across the world to do business with and in Estonia. For instance it will be possible to register a company, to pay fees and open a bank account in Estonia from abroad. It may also make it easier for foreign investors to play a more active role in the management of companies located in Estonia (Taavikotka, 2014).

Improving product market regulation

19. Competition-friendly product market regulation stimulates innovation and technology diffusion by ensuring flexible resource allocation and faster convergence to the productivity leaders (Johansson and Olaberria, 2014; Andrews and Westmore, 2014). Overall regulation in Estonia appears more competition-friendly than in OECD countries on average (Figure 8). However, there is scope to strengthen competition and the effective use of resources by removing remaining entry barriers for foreigners and continuing the reform of corporate bankruptcy procedures.

Figure 8. Product market regulation

Note: OECD refers to the simple average.

Source: OECD (2013), Product Market Regulation Indicators.

Removing entry barriers for foreigners

20. Continued efforts are needed to identify and remove remaining entry barriers that hold back competition and growth, especially in services. Entry barriers can hold back productivity growth throughout the economy because of the services' role as intermediate inputs. Excessive regulation of professional services has particularly strong negative growth effects in downstream service intensive industries (Bourlès, et al., 2013; Barone and Cingano, 2011). In Estonia, the services account for 58% of total value added and over half of domestic value added in exports. The regulatory regime is overall conducive to fostering competition in the services (OECD, 2014b). However, some entry barriers remain in the services, notably:

- Some professional services in Estonia benefit from a number of exclusive rights, according to the OECD PMR indicator 2013. For instance, engineers have exclusive rights to conduct environmental assessments and monitoring of engineering projects. Unlike in many other countries, a range of audits can only be conducted by accountants. For some of these exclusive rights it would be possible to open the market to a broader range of providers without harming service quality or endangering consumer protection.
- Entry barriers are high for non EU-foreigners in some professional services, notably in legal services. There is no process for the recognition of foreign qualifications in regulated professions except for countries with which Estonia has signed special agreements. Re-qualification exams

have to be taken in Estonian, which imposes unnecessary entry barriers, including on entrants from EU countries. Similar language restrictions may also exist in other cases. Also, only lawyers who are fully licenced in an EU Member state may own shares and be partners in law firms (OCED, 2014b).

- In maritime transport, nationality and residency conditions are imposed on registering ships. Government plans to facilitate market access for foreigners are welcome. A majority of the board of directors in maritime transport firms registered in Estonia must be Estonian citizens. Moreover, maritime and air transport are the only service sectors in which Estonia employs foreign equity restrictions, with a maximum foreign equity share of 49% (OCED, 2014b).

21. Another barrier for foreigners to do business in Estonia are restrictions for non-EU citizens to purchase land in eastern border areas of the country, even if they reside in Estonia (OECD, 2011f). There is also scope to further expand the use of English in the administration. Some domestic standards are not available in English (OECD, 2011a). To furnish an already transparent regulatory environment, authorities may consider translating into English those domestic standards currently available only in Estonian, including at the local level.

Continuing to review corporate bankruptcy procedures

22. Corporate bankruptcy laws which impose excessively high exit costs in the event of business failure may make entrepreneurs less willing to experiment and thus hold back the efficient reallocation of resources and innovation (Andrews and Criscuolo, 2013). At the same time, bankruptcy codes that do not provide sufficient safeguards for creditors may reduce the supply of credit, so some balance is required (Andrews and Criscuolo, 2013; OECD, 2014d). Estonia made considerable progress with reforming bankruptcy legislation in 2011. Nonetheless, recovery of creditor claims is relatively weak and insolvency procedures are long (Figure 9). This may also be one reason for the fairly negative attitude of the public towards entrepreneurs on a second start after failure (European Commission, 2013a; OECD, 2013h). Lengthy procedures may be one reason for low recovery rates, also because it raises uncertainty. Efforts should continue to reform insolvency procedures and make them more efficient. In particular, the duration of insolvency procedures should be reduced and recovery of creditor claims increased. It should also be considered whether a voluntary non-judicial debt settlement process can raise efficiency. Such a settlement process has been introduced for example in the United Kingdom (“Company Voluntary Arrangements”), where the debtor appoints an insolvency practitioner to draw up a debt restructuring plan, allowing the company to continue to operate if creditors agree.

Figure 9. Bankruptcy procedures: recovery rates and duration

Source: OECD (2013), Entrepreneurship at a Glance.

23. There are concerns that corporate insolvency cases are not always resolved in a manner that contributes to an efficient allocation of resources (*Economic Survey of Estonia 2011*, OECD, 2011f). The decision to liquidate or rehabilitate a company can be complex, and require economic expertise. Judges may not be able to draw on the necessary expertise to deal with complex cases (European Commission, 2013b). Debt restructuring procedures allow outside expertise, but it is almost never used because insolvent debtors must pay for the experts and they rarely have the funds to do so. Courts should be given the power to require the creditor to pay for experts, particularly in more intricate corporate cases. A specialised bankruptcy court could ensure that sufficient judicial expertise is applied to bankruptcy procedures, as suggested in previous Surveys.

Ensuring access to finance for SMEs

24. Foreign banks, mostly from Nordic countries account for 94% of total bank assets (Eesti Pank, 2013). Foreign ownership cushioned the impact of the crisis on the country's financial system (Eesti Pank, 2013; OECD, 2011c). Foreign-owned banks rely on scoring and hard verifiable information for lending decisions and real estate as collateral (Beck et al., 2008; OECD, 2011c). As a result, interest rates on bank loans may be higher for SMEs or their applications more likely to be rejected. Smaller companies are harder to assess for banks, as usually their financial reports contain less information and their credit histories are short (Eesti Pank, 2014).

25. Access to bank lending is more difficult for SMEs than in many other EU countries (European Commission, 2013b; OECD, 2013b, World Bank, 2014). The share of small firms using external funding is one of the lowest in the EU. Instead, funding through sources outside the financial sector is more widespread. The share of SMEs whose loan application is rejected is fairly high (European Commission, 2013g). It is welcome that the availability of venture capital has improved recently. Small enterprises with less than 250 employees account for 78.4% of total value added, more than in most other OECD countries (OECD, 2014d).

26. Savings and loan associations are considered to be particularly conducive to SME lending (Ayadi, R. et al., 2010). Through relationship lending, they reduce asymmetric information which is likely

to limit SMEs' access to funding. Savings and loan associations also diversify financial intermediation, which is conducive to greater financial stability and regional growth (Chiaramonte et al., 2013). Local banks are also more likely to use savings to fund investment in the same region, which tends to favour development of regions with relatively low income levels. In the absence of local banking, credit rationing may hit poor regions particularly hard because of lower initial endowments, which may, for example, restrict available collateral (Hakenes et al, 2009). Savings and loan associations may also contribute to lower borrowing costs for enterprises by increasing competition. They have a long tradition, for instance in Germany, where they account for 13% of total bank assets, and in Austria (Ayadi, R. et al., 2010).

27. Twenty savings and loan associations existed in Estonia in January 2014. Their loan volume increased by more than 70% since 2012, mainly on account of rising business loans. Nonetheless, they only account for 0.1% of total lending (Eesti Pank, 2014; OECD, 2011a). Loans tend to be small on average, 6 000 euros for private individuals and 43 000 euros for companies, mostly SMEs. Savings and loan associations offer higher interest rates on deposits than banks, what makes them attractive for depositors especially in the current low interest environment. The proportion of non-performing loans is comparatively small (Eesti Pank, 2014).

28. Savings and loan associations are not supervised by the Financial Supervision Authority, as they do not have a banking licence. They are regulated by the Savings and Loan Associations Act. They accept deposits only from members and their deposits are not covered by deposit insurance. Loans may not exceed the contribution paid in by a member more than 20 times, nor may it exceed 20% of the association's equity. This limits the growth potential of these associations. Obtaining a banking licence could help savings and loan associations to expand. However, requirements for savings and loan associations to receive a banking licence are stringent.

29. The EU banking sector directive allows for some leeway to reduce regulatory burdens on small licenced banks, regarding for instance the conditions capital instruments have to meet to qualify as Common Equity Tier 1 instruments (European Commission, 2013e; European Commission, 2013f). Also, the administrative burden and information requirements related to recovery and resolution plans can be reduced considerably for small credit institutions (European Commission, 2014b). This leeway is not being used fully in Estonia. Unnecessary barriers for savings and loan associations to apply for a banking licence should be addressed. Moreover, unlike banks, cooperatives do not benefit from an exemption of interest on deposits from personal income tax (Eesti Pank, 2014), distorting competition for deposits.

30. Several governments of OECD countries attempted to facilitate lending relationships by reducing asymmetric information between lenders and borrowers, which is particularly marked in the case of small borrowers. In some countries, independent public institutions conduct an assessment of credit worthiness, for example with the support of the central bank, as in France. Credit mediators may also be entrusted with other 'soft' functions, such as monitoring the financing framework, assessing the difficulties encountered by SMEs and providing advice to competent authorities. In general, credit mediation schemes depend entirely on public funding (OECD, 2013d). In the wake of the 2008-2009 global financial crisis, a number of European OECD countries introduced credit mediation schemes intended as temporary mechanisms. In France and Belgium credit mediation schemes evolved into longer term initiatives (OECD, 2013d).

31. The relatively short time of operation of these credit mediation services and the lack of firm-level data do not yet allow definitive conclusions about their economic impact to be drawn. However, available evidence suggests that credit mediation schemes have been effective in responding to the needs of SMEs that had been denied credit (OECD, 2013d; Banque de France, 2011). Such instruments may turn out to be particularly useful in economic downturns or financial crises.

Closing existing infrastructure gaps

32. Transport, communication and energy networks are key factors for internationalization and economic growth. They reduce isolation, open new markets and encourage companies to invest (European Commission, 2012). Estonia has made considerable progress in upgrading its infrastructure (World Economic Forum, 2013). Investment in infrastructure is high compared to most other EU countries (Wagenvoort et al., 2010). One reason is EU funding, which is used to a large extent to finance infrastructure projects and accounted for 4% of GDP in 2012 (Eesti Pank, 2013). However, a number of cross-border and domestic infrastructure bottlenecks remain, holding back private sector development and constraining mobility (National Audit Office, 2013b).

- Transport infrastructure links to the rest of the EU should be improved, particularly for railways, and the Baltic-Adriatic highway link further developed (European Commission, 2012). The Rail Baltica project, which will connect Estonia with the EU via high-speed railway needs to be realised without further delays (AECOM, 2011; IMF, 2014).
- Integration of Estonia in the European gas network remains weak. The Estonian gas market is small and is at present fully dependent on Russian gas imported by the monopolist company Eesti Gaas, which is majority-owned by Russia's Gazprom (IEA, 2013). To address these weaknesses, the government has developed further plans to diversify gas imports. Plans to better integrate in the EU gas networks and install a regional liquefied natural gas terminal together with Finland should be implemented rapidly to enhance the security of supply. This is of increasing importance in an uncertain geopolitical environment; with the share of renewable energies continuing to rise; and domestic oil shale being increasingly used for fuel instead of electricity production.
- Estonia has made considerable progress with integrating in the European electricity market. Two electricity transmission links with Finland already operate. However, synchronised operation within the EU electricity network is not envisaged before 2025. This requires cooperation with EU countries in the region (IEA, 2013).
- Funding for domestic infrastructure projects was primarily directed to large projects, which can be financed with EU funds, leaving fewer funds for smaller rural projects. There is evidence that some EU-funded projects have been designed too large (National Audit Office of Estonia, 2013a). Instead, the quality of the road and rail network is low, particularly in rural areas (European Commission, 2012); the availability of high-speed broadband seems to be limited in rural areas (OECD, 2013b); and investment in renovation is low (National Audit Office of Estonia, 2013b). This suggests that there is scope to improve monitoring and decision making on how infrastructure projects are selected. As Estonia continues to upgrade its infrastructure, it should be ensured that sufficient funding is directed towards balanced regional development. This could also help to overcome the spatial mismatch of jobs and job searchers.
- Continued efforts are needed to better connect transport modes, including railway, ports and airports (European Commission, 2012). Insufficient connection of modes may limit mobility and constrain economic activity and exports. There is also scope to harmonise travel schedules of different transport modes (European Commission, 2013b).
- Gaps in public water supply and sewerage treatment remain, despite large investments over the past decade. Waste water is still not collected in the required quantities and its treatment does not always meet requirements. Access to drinking water of sufficient quality is not guaranteed in some areas (National Audit Office of Estonia, 2013c). This is reflected in a fairly low satisfaction

with water quality (OECD, 2013g). Remaining gaps in the provision of high quality drinking water and sewerage treatment should be closed.

Reducing CO₂ emissions and energy consumption

33. The efficient use of energy can raise competitiveness by bolstering innovation and reducing costs, including those of environmental damage (OECD, 2011d). The cost of high energy use will increase when CO₂ prices in the European Union's emissions trading system rise from currently unsustainably low levels. It has also an important environmental dimension. Greenhouse gas emissions per unit of GDP are less than half the 1990 level but remain among the highest in the OECD (Figure 10). High emissions are largely due to the use of oil shale especially in electricity generation, of which part is exported, as well as in heating and industrial process use. Estonia has large oil shale reserves and is the only country in the world in which oil shale is the primary source of energy, covering 70% of energy demand. Exploiting these reserves has contributed to meeting energy security objectives. However, the CO₂ intensity of oil shale combustion is particularly high. CO₂ emission intensity of electricity and heat is among the highest in the OECD (IEA, 2013), whereas emissions in transport are comparatively low (OECD, 2013e). The amount of CO₂ emissions and oil shale ash created per unit of oil shale energy and heat production has increased by 11% between 2007 and 2012 (National Audit Office of Estonia, 2014b).

Figure 10. Greenhouse gas emissions and energy consumption

1. Data refer to gross direct emissions including emissions from land-use, land-use change and forestry (LULUCF). Removals/sequestration of greenhouse gas through LULUCF are deducted.
2. It refers to total primary energy supply and equals production plus net trade minus international bunkers plus or minus stock changes.

Source: OECD/IEA (2013), Emissions of CO₂, CH₄, N₂O, HFCs, PFCs and SF₆, IEA CO₂ Emissions from Fuel Combustion Statistics Database and OECD Economic Outlook; and IEA (2013), Energy Balances of OECD Countries.

34. High CO₂ emissions may become very costly in the future. Carbon prices in the European Union's emission trading system are likely to rise when economic activity strengthens in Europe and stricter CO₂ emissions targets are applied. Estonia has set a target for greenhouse gas emissions in sectors outside the European emissions trading system (ETS) for 2020, which limits their growth to 11% from the level in 2005. While the government expects to meet this target on current policies, more ambitious emission targets may have to be met beyond 2020 in the context of targets set by the European Union (OECD, 2014a). Estonia has also committed to increasing the share of renewable energy to 25% of gross final energy consumption. It reached 14.1% in 2012, with the largest part being generated by the use of biomass, mainly for heating purposes (IEA, 2013).

Reviewing tax incentives to promote energy efficiency

35. Implicit carbon tax rates, defined as tax revenue per tonne of CO₂, are low on average and vary considerably across energy sources and uses. Tax rates on fossil fuels used in heat and electricity generation are much lower than on transport and these differences are bigger than in many other OECD countries (OECD, 2013e). Moreover, oil shale used for heat production and electricity generation is taxed at lower rates than other fossil fuels (IEA, 2013; OECD, 2014a). Natural gas is only taxed when used for heating; instead, coal used for heating is untaxed. Also, gasoline is taxed at a higher rate than diesel, both in terms of energy and CO₂ content. Tax rates should reflect the CO₂ emission content of each energy source to provide effective price signals (OECD, 2013e). This can be a gradual process, provided a firm commitment to future increases is made.

36. More efforts are needed to identify and internalise externalities generated by oil-shale use (National Audit Office of Estonia, 2014b). Important goals of the government's oil shale development plan have not been achieved, including to mine and use oil shale more efficiently and reduce the environmental impact thereof (National Audit Office of Estonia, 2014b). It is welcome that the government envisages a new oil shale development plan and intends to increase taxes on oil-shale related activities which damage the environment. Raising taxes on oil shale use and harmonizing tax rates according to the CO₂ emission content of energy sources would help to encourage processing oil shale into lighter oil products instead of using it for electricity generation which would reduce CO₂ emissions from oil shale use by two-thirds (IEA, 2013). Also, continued R&D investment is needed to lower the carbon intensity of the Estonian economy, including by the private sector and Eesti Energia (IEA, 2013). Further efforts are also needed to internalise the costs of reusing or recycling the considerable waste amounts generated in oil shale use (National Audit Office of Estonia, 2013a). Moreover, it should be ensured that the state receives an appropriate share of revenues from oil shale mining and use (National Audit Office of Estonia, 2014b).

37. Fuel poverty is of increasing concern as energy costs rise (Thomson, 2013; Association for the Conservation of Energy, 2013). It is usually defined as the percent of household disposable income spent on energy; for instance more than 10% is often characterised as energy poverty. Low-income households should receive more financial support for energy-saving investments, such as for the purchase of energy-saving household appliances (IEA, 2012). Currently subsidies are available only to improve energy efficiency of family houses and apartment buildings by Kredex (see Box 1). Subsistence payments should be regularly adjusted for changes in energy prices, for instance due to increases in energy taxes. This would preserve incentives to save energy.

Enhancing energy efficiency of district heating and buildings

38. Emissions can be reduced considerably by improving energy efficiency in district heating (European Commission, 2013b). The sector is predominantly operated by privately owned entities and, in some areas, municipalities. Losses in heat networks, to which 70% of the population are connected, amount to 22% (IEA, 2013). The government's plans to introduce regulation which will provide networks

with incentives to reduce losses to 15% by 2017 are welcome. The government has also proposed draft regulation that encourages the use of renewable biomass in district heating.

39. Regulation of heat networks should be reviewed for scope to raise incentives for efficiency improvements. Currently, regulation of prices is based on an ex-ante cost-based principle, which may entail limited incentives to invest (Égert, 2009; IEA, 2013). It should be considered whether incentives for efficiency improvements in the network could be enhanced, for example by penalizing operators which fail to attain ambitious efficiency benchmarks (yardstick competition). Using the costs and quality standards achieved by other service providers for regulating prices of each service provider generates incentives to improve quality and reduce costs. These incentives are partly lost if price regulation is based on each provider's own costs (OECD, 2006).

40. There is scope to raise incentives of households and building owners to invest in energy efficiency of buildings. Many district heating systems have inadequate or no metering. Also, landlords have few incentives to invest in efficiency improvements which will mainly benefit the tenant. Tenants have few incentives to make investments in a residential property they do not own. The government may need to adopt targeted measures to address "split incentives" between landlords and tenants. For instance, tax incentives may be provided to landlords or it should be ensured that investment costs can be passed on to the tenant or beneficiary of the reduced energy bills (OECD, 2008a; IEA, 2012). Moreover, customers with obligatory connections to district heating systems may be prevented from investing in economically justified high-efficiency alternatives. Some local governments establish district heat supply areas, in which customers cannot change the type of heat supplied unless they switch to renewable energy (IEA, 2013).

Behaviourally informed policies can promote energy efficiency

41. Traditional incentive and regulatory instruments can be effectively supplemented by behavioural regulatory measures in many cases, including to promote energy efficiency. Behaviourally informed regulation, while preserving free choice, aims at designing the decision context so to make better-informed decisions more likely. Often behaviourally informed policies are low-cost and strengthen the effectiveness of incentives provided, for example, by taxes or regulation. Though, their design may require considerable research efforts. An empirical approach, using local policy trials and experiments to test behaviourally informed ideas is most promising, as experience from other countries suggests (Lunn, 2014). For instance, in the UK behaviourally informed policy instruments are used to encourage households to install better insulation in cases where there is a tendency to underinvest (Box 2). Upgrading energy efficiency of buildings is one of Estonia's most significant energy efficiency challenges.

Box 2. Using behavioural science to encourage investment in insulation – evidence from the UK

The UK Behavioural Insights Team, which acts as an internal consultancy for UK policy makers, has organised a series of trials that use behavioural science to encourage households to install better insulation (Lunn, 2014). The primary problem to overcome, according to behavioural economic research, is that householders are likely to weigh immediate costs disproportionately relative to benefits that only accrue over many years. While individuals tend to be sure of immediate costs, they may be more uncertain about the scale of future benefits than available data warrant. Moreover, when individuals are unsure about decisions, they often copy the decisions of others around them. This strengthens the impact of policies improving informed decision-making.

The UK Behavioural Insights Team, in partnership with local authorities and retailers, used this evidence to design and test four behavioural mechanisms for their potential to increase the take-up of insulation: an upfront reward (for instance in form of a voucher or a one-month holiday from local taxation); discounts for signing up neighbours for energy efficiency improvements; community rewards for signing up additional households; and subsidised loft clearance. While full comparative results are not yet published, one perhaps surprising finding to emerge from the trials is that the impact of subsidising loft clearance turned out to be particularly strong, resulting in a four-fold increase in the probability of installing loft insulation.

42. Estonia should consider engaging more in local policy trials and experiments to promote energy efficiency through behaviourally informed policies. Such policies may be designed and monitored by a Behavioural Policy Unit, following the example of the UK Behavioural Insights Team (see Box 2). Information policies may also help to realise considerable energy saving efforts, for example by providing a regular indication of energy costs to households, even in cases where end-user metering is not economic (IEA, 2013).

Box 3. Recommendations to raise productivity and benefit more from openness

Reaping more benefits from innovation

- To strengthen knowledge transfers to domestic firms, promote applied research and improve collaboration with domestic and foreign institutions conducting applied research. Move ahead with the open data initiative.
- To raise the effectiveness of innovation policies, ensure inter-ministerial working groups are held accountable and their performance is regularly reviewed. Assess the need for an independent review and advisory body on microeconomic policy reform and regulation with the aim of achieving better informed policy decisions.
- Enhance effectiveness of evaluation of innovation policies by incorporating monitoring and evaluation already at the design stage. Test individual instruments through pilot projects.
- Extend the impact assessment of regulations to systematically capture implications for trade and investment.
- Promote international and applied management skills and enhance the teaching of skills to run a business at school.

Removing barriers to entrepreneurship

- Shorten corporate insolvency procedures and improve their efficiency. Strengthen expertise to deal with complex insolvency cases, for example by giving courts the power to require the creditor to pay for experts. Review the need for a specialised bankruptcy court.
- Continue efforts to identify and remove entry barriers in services that hold back competition and growth, including in professional and transport services. Consider relaxing restrictions on land purchases by non-EU citizens with a permanent residence permit. Promote the use of English in the administration.
- To remove barriers to SME lending, consider making it easier for savings and loan associations to apply for a banking licence. For instance, reduce capital requirements and requirements for recovery and resolution plans. Tax returns on bank deposits equally across all banks. Assess the need of a credit mediation programme.

Removing remaining infrastructure bottlenecks

- Implement plans to expand access to European high-speed rail networks and energy supply facilities.
- Provide sufficient funding for small, rural infrastructure projects. Improve inter-modal transport connections. Close remaining gaps in the provision of high quality drinking water and sewerage treatment.
- Raise efforts to monitor the effectiveness and efficiency of infrastructure spending.

Raising energy efficiency

- Gradually align and raise tax rates on the various energy sources according to their CO₂ emission content. Ensure income support for low income households accounts for the impact of higher energy costs on poverty risks.
- Continue efforts to process oil shale into lighter oil products instead of using it for electricity generation. Internalise all social and environmental costs of oil shale.
- Strengthen incentives to improve efficiency in the regulation of heating networks.

- Strengthen incentives to invest in energy efficiency of buildings.
- Consider engaging more in local policy trials and experiments to promote energy efficiency through behaviourally informed policies.

BIBLIOGRAPHY

- AECOM (2011), *Rail Baltica Final Report – Executive Summary*, May 2011, Co-financed by the European Union Tran-European Transport Network (TEN-T).
- Andrews, D. and C. Criscuolo (2013), “Knowledge-Based Capital, Innovation and Resource Allocation”, *OECD Economics Department Working Papers*, No. 1046, OECD Publishing.
- Andrews, D. and B. Westmore (2014), “Managerial Capital and Business R&D as Enablers of Productivity Convergence”, *OECD Economics Department Working Papers*, No. 1137, OECD Publishing.
- Association for the Conservation of Energy (2013), “*The Cold Man of Europe*”, Energy Bill Revolution, March 2013.
- Ayadi, R. et al. (2010), *Investigating Diversity in the Banking Sector in Europe – Key Developments, Performance and Role of Cooperative Banks*, Centre for European Policy Studies, Brussels.
- Banque de France (2011), *Credit Mediation and Bankruptcy*, presentation at the OECD WPSMEE 40th Session, 25-26 October 2011, Paris.
- Barone, G. and F. Cingano (2011), “Service Regulation and Growth: Evidence from OECD Countries”, *The Economic Journal*, 121:931-957.
- Benkovskis, K. and A. L. Rimgailaite (2011), “The quality and variety of exports from the new EU member states”, *The Economics of Transition*, 19(4).
- Bourlès, R. et al. (2013), “Do Product Market Regulations in Upstream Sectors Curb Productivity Growth? Panel Data Evidence for OECD Countries”, *Review of Economics and Statistics*, No. 95(5), 1750–1768.
- Chiaromonte, L., F. Poli, and M. E. Oriani (2013), “Are Cooperative Banks a Lever for Promoting Bank Stability? Evidence from the Recent Financial Crisis in OECD Countries”, *European Financial Management*.
- Eesti Pank (2013), *Review of the Estonian Financial System*, January 2013, Tallinn.
- Eesti Pank (2014), *Financial Stability Review*. May 2014, Tallinn.
- Égert, B. (2009), “Infrastructure Investment in Network Industries: The Role of Incentive Regulation and Regulatory Independence”, *OECD Economics Department Working Papers*, No. 688, OECD Publishing.

- Estonian Development Fund (2013), *Smart Specialisation – Activities Analysis of Bottlenecks and New Opportunities*, June 19, 2013, Tallinn.
- European Commission (2010), *Expert Evaluation - Network Delivering Policy Analysis on the Performance of Cohesion Policy 2007-2013- Task 1: Policy Paper on Innovation: Estonia*, August 2010.
- European Commission (2012), *Position of the Commission Services on the Development of Partnership Agreement and Programmes in ESTONIA for the Period 2014-2020*.
- European Commission (2013a), *Enterprise and Industry ESTONIA 2013 SBA Fact Sheet*.
- European Commission (2013b), *Industrial Performance Scoreboard – Member States' Competitiveness Performance and Implementation of EU Industrial Policy*.
- European Commission (2013c), *Estonia 2020 Action Plan for 2011-2015*, April 2013
- European Commission (2013d), "Erawatch Country Reports 2012: Estonia", *IRC Scientific and Policy Reports*.
- European Commission (2013e), "Capital Requirements - CRD IV/CRR – Frequently Asked Questions", Brussels, 16 July 2013.
- European Commission (2013f), "Directive 2013/36/EU", *Official Journal of the European Union*, L 176/338, 27 June 2013.
- European Commission (2013g), "2013 SMEs' Access to Finance survey", Analytical Report, Ipsos MORIS, Brussels, 14/11/2013.
- European Commission (2014a), *Innovation Union Scoreboard 2014*, Brussels.
- European Commission (2014b), "Directive 2014/59/EU", *Official Journal of the European Union*, 12.06.2014.
- European Research Area Committee (2012), "Peer-Review of the Estonian Research and Innovation System - Steady Progress Towards Knowledge Society", *Innovation Studies*, No. 19/2012.
- Hakenes, H., R. H. Schmidt und R. Xie (2009), "Public Banks and Regional Development", *mimeo*, University of Frankfurt.
- International Energy Agency IEA (2012), *Mobilising Investment in Energy Efficiency – Economic Instruments for Low-Energy Buildings*, Paris.
- International Energy Agency IEA (2013), *Energy Policies Beyond IEA Countries: Estonia*.
- International Monetary Fund IMF (2014), Republic of Estonia, 2014, Article IV Consultation – Staff Report, *IMF Country Report*, No. 14/112, May 2014.
- Johansson A. and G. Nicoletti (2014), "Long-Term Patterns of Trade and Specialisation", *OECD Economics Department Working Paper Series*, forthcoming.

- Johansson, Å. and E. Olaberria (2014), “New Evidence on the Determinants of Industrial Specialisation”, *OECD Economics Department Working Papers*, No. 1112, OECD Publishing.
- Lunn, P. (2014), *Regulatory Policy and Behavioural Economics*, OECD Publishing.
- Masso, J., P. Vahter, (2014), The Role of Product Level Dynamics in Export Growth and Productivity: Evidence from Estonia. *Emerging Markets Finance and Trade*. *Forthcoming*.
- Masso, J., T. Roolaht and U. Varblane (2010), “Foreign Direct Investment and Innovation in Central and Eastern Europe: Evidence from Estonia”, *Working Papers of Eesti Pank*, No. 5.
- Ministry of Economic Affairs and Communications (2013), *Estonian Entrepreneurship Growth Strategy 2014-2020*, September 2013, Tallinn.
- Ministry of Education and Research/Ministry of Economic Affairs and Communications (MER/MEAC, 2014), *Estonian Research and Development and Innovation Strategy 2014-2020 “Knowledge-based Estonia”*, 21.01.2014, Tallinn.
- National Audit Office of Estonia (2013a), *Overview of the use and preservation of state assets in 2012–2013- Summary of Problems in the Development and Economy of Estonia by the National Audit Office*, Tallinn 2013.
- National Audit Office of Estonia (2013b), *Quality of Renovation of Main Roads of State*, Tallinn, 22 November 2013.
- National Audit Office of Estonia (2013c), *Sustainability of drinking water and waste water systems developed with state support and impact on achievement of environmental goals Do drinking water and waste water systems meet requirements?*, Tallinn, 2 December 2013.
- National Audit Office of Estonia (2014a), *Impact of innovation support measures on competitiveness of companies*, Tallinn 2014, forthcoming.
- National Audit Office of Estonia (2014b), *Riigi tegevus põlevkivi kasutamise suunamisel Kas riik tagab põlevkivivaru jätkusuutliku kasutamise?*, Tallinn, 12 March 2014.
- OECD (2006), *Infrastructure to 2030 (Vol. 2): Mapping Policy for Electricity, Water and Transport*, OECD Publishing, Paris.
- OECD (2008a), *Household Behaviour and the Environment – Reviewing the Evidence*, OECD Publishing.
- OECD (2008b), “Trade and Innovation: A Synthesis Paper”, *Working paper*, TAD/TC/WP(2008)6/PART1/REV1, Trade and Agriculture Directorate,
- OECD (2011a), *Enhancing Market Openness, Intellectual Property Rights, and Compliance through Regulatory Reform in Estonia*, OECD Publishing.
- OECD (2011b), “Estonia: Towards a Single Government Approach”, *OECD Public Governance Reviews*, OECD Publishing.
- OECD (2011c), *Estonia – Review of the Financial System*, OECD Publishing.
- OECD (2011d), *OECD Green Growth Studies: Energy*, OECD Publishing.

- OECD (2011e), *Skills for Innovation and Research*, OECD Publishing
- OECD (2011f), *OECD Economic Surveys: Estonia 2011*, OECD Publishing.
- OECD (2012a), “ICT Skills and Employment: New Competences and Jobs for a Greener and Smarter Economy”, *OECD Digital Economy Papers*, No. 198, OECD Publishing.
- OECD (2012b), *Science, Technology and Industry Outlook 2012: IV.10. Science and Innovation: Estonia*, OECD Publishing.
- OECD (2012c), *OECD Economic Surveys: Estonia 2012*, OECD Publishing.
- OECD (2013a), *Interconnected Economies: Benefiting from Global Value Chains – Global Value Chains (GVCs): Estonia*, OECD Publishing.
- OECD (2013b), *OECD Science, Technology and Industry Scoreboard 2013*, OECD Publishing.
- OECD (2013c), *OECD Compendium of Productivity Indicators*, OECD Publishing.
- OECD (2013d), *Working Party on SMEs and Entrepreneurship (WPSMEE) Credit Mediation for SMEs and Entrepreneurs: Final Report*, OECD Publishing.
- OECD (2013e), *Taxing Energy Use: A Graphical Analysis*, OECD Publishing.
- OECD (2013f), *Innovation-driven Growth in Regions: The Role of Smart Specialisation*, preliminary version, OECD Publishing.
- OECD (2013g), *How’s Life? 2013: Measuring Well-being*, OECD Publishing.
- OECD (2013h), *Entrepreneurship at a Glance 2013*, OECD Publishing.
- OECD (2013i), *OECD Economic Surveys: Switzerland 2013*, OECD Publishing.
- OECD (2014a), *Climate Change Mitigation in Estonia, Technical Background paper*, OECD Publishing, forthcoming.
- OECD (2014b), *OECD Services Trade Restrictiveness Index (STRI): Estonia*, OECD Publishing.
- OECD (2014c), *OECD Factbook 2014: Economic, Environmental and Social Statistics*, OECD Publishing.
- OECD (2014d), *Entrepreneurship at a Glance 2014*, OECD Publishing.
- OECD (2014e), *All on Board – Making Inclusive Growth Happen*, OECD Publishing.
- OECD/WB (2014), *Making Innovation Policy Work – Learning from Experimentation*, OECD Publishing.
- Statistics Estonia (2013), “Last Year the Expenditures on Research and Development Activities Remained at the level of 2011”, *News Release*, No. 145, 03 December 2013.
- Taavikotka (2014), 10 million “e-Estonians“ by 2025, 04 May 2014, <http://taavikotka.wordpress.com/2014/05/04/10-million-e-estonians-by-2025/>.

- Thomson, H. (2013), “Fuel Poverty Measurement in Europe: A rapid review of existing knowledge and approaches conducted for eaga Charitable Trust”, *The University of York, eaga, charitable trust*, October 2013
- UNCTAD (2011), “Best Practices in Investment for Development – How to attract and benefit from FDI in small countries Lessons from Estonia and Jamaica”, *Investment Advisory Series*, Series B, No. 6.
- Ubaldi, B. (2013), “Open Government Data: Towards Empirical Analysis of Open Government Data Initiatives”, *OECD Working Papers on Public Governance*, No. 22, OECD Publishing.
- Vahter, P. (2011), “Does FDI Spur Productivity, Knowledge Sourcing and Innovation by Incumbent Firms? Evidence from Manufacturing Industry in Estonia”, *World Economy*, No. 34(8), 1308–1326.
- Wagenvoort R., C. De Nicola, A. Kappeler (2010), “Infrastructure Finance in Europe: Composition, Evolution and Crisis Impact”, *EIB Papers*, 15/1, EIB.
- World Bank (2014), *Doing Business 2014 – Economic Profile: Estonia*, 11th edition, Washington.
- World Economic Forum (2013), *The Global Competitiveness Report 2013–2014*.

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