

APPENDIX 1. ASSESSING THE TRANSITION RISKS IN THE BANKING SECTOR

Climate change and environmental damage are among the greatest challenges facing the world today, and they demand attention from all areas of life, including the economy and financing. The transition to a climate-friendly and sustainable economy means reducing the demand for carbon-intensive products. To maintain output and profitability, companies need to review their supply chains and change their production models. This increases their costs and means greater credit and reputation risk for the banks that finance them. This will probably cause the value of some assets in the banking sector to change, and the changes in lending policy will affect the structure of the financing of the economy.

The financial sector has an important role to play in combating climate change, because of its ability to affect different stakeholders through their financing conditions, and also through other activities such as:

- investing in solutions with low carbon emissions;
- financing technology to reduce emissions;
- funding work to adapt to climate change;
- reporting transparently on how projects impact the climate; and
- engaging businesses and policymakers.

The banking sector needs to weigh the environmental, social and governance (ESG) risks when making decisions on lending. When making decisions on loans, the banks will have to consider not only the return on the project and the solvency of the client as usual, but also how well aligned the project is with environmental targets.

The changes that society needs to make to transition to a climate-friendly economy will be accompanied by risks for the financial sector. These risks may appear from the rapid transition to an economy with low carbon emissions and in the form of physical risks. Transition risks are those that come from sharp changes in the economic environment that may arise from strict climate and environmental policy, or from changes in the habits of consumers and markets, and from the introduction of new technologies. Carbon-intensive sectors of the economy are particularly exposed to transition risks. Physical risks cover the direct loss of assets that may be caused by long-term changes in the environment, such as a rise in the average air temperature or in precipitation, or from extreme events caused by climate change such as storms, floods, forest fires or drought.

The European Central Bank published the results of stress tests covering the whole economy of the euro area in summer 2021. The analysis assessed the resilience of companies and banks to climate risk. The exposure to extreme weather events as a physical risk was very different across countries and by hazard type. The companies facing the highest physical risk were mainly concentrated in southern Europe, where 25% of businesses can be classed as companies at high physical risk. In Northern and Central European countries, 5% of companies are exposed to high physical risk²³. This suggests that the exposure of the Estonian banking sector to physical risks is limited. However, the exposure of Estonia to transition risks is estimated to be above average²⁴.

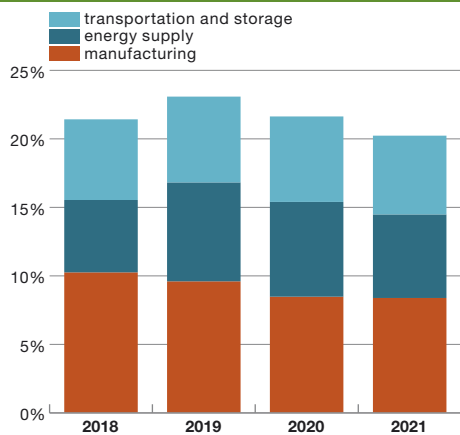
Estimating the transition risks of the banking sector needs the carbon footprints of financial companies and the carbon-intensity of their assets to be measured. A larger carbon footprint or greater carbon-intensity indicate larger risks, as they make it harder to adapt the portfolio. Several indicators are used internationally that allow the carbon footprint of economic sectors to be compared, and so the carbon-intensity of the loan portfolio of the banking sector to be estimated.

The share of the loan portfolio of the banking sector that goes to economic sectors with large carbon emissions can be considered first. Sectors that have large greenhouse gas emissions are

²³ Countries in southern Europe are threatened most by forest fires, while countries in Eastern, Northern and Central Europe are threatened above all by the increased frequency of floods.

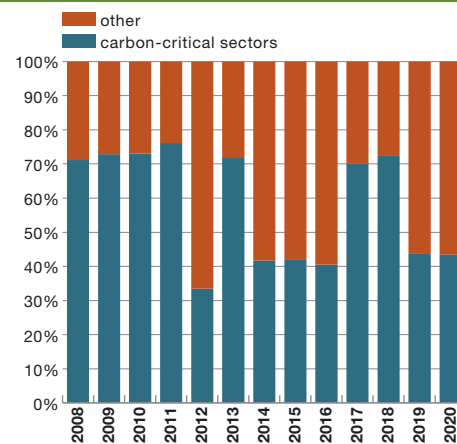
²⁴ <https://www.ecb.europa.eu/pub/pdf/scpops/ecb.op281~05a7735b1c.en.pdf>.

Figure A1.1. Loans to carbon-intensive sectors as a share of the total corporate loan portfolio



Data as at 31 May 2021
Sources: European Environmental Agency, AnaCredit database, Eesti Pank calculations

Figure A1.2. Loans to carbon-critical sectors as a share of the total corporate loan portfolio

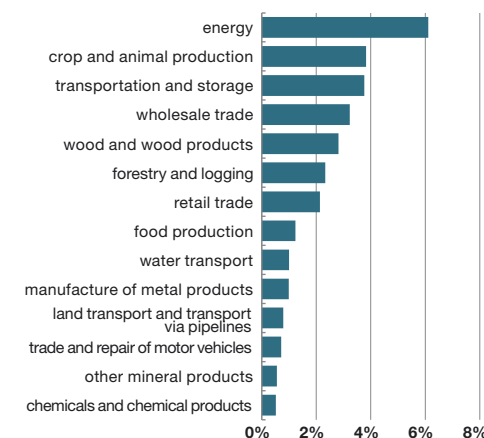


Sources: European Environmental Agency, AnaCredit database, Eesti Pank calculations

the most sensitive to changes in climate policy²⁵. In Estonia this means primarily the energy sector, but also transport and manufacturing. The share of loans in the loan portfolio of the banking sector that have been issued to the three most carbon-intensive sectors has held steady for the past three years at 20-23%, which is around 5% above the European Union average (see Figure A1.1).

Focusing only on the sectors with the largest carbon emissions overlooks however those sectors that have average carbon-intensity but dominate in the loan portfolio and so are important in assessing the transition risks of the banks. The share of Carbon Critical Sectors (CCrS) in the loan portfolio is calculated from the total carbon emissions of each sector, and the share of that sector in the loan portfolio of the banking sector. Faiella and Lavecchia (2020) created the CCrS index by ordering economic sectors firstly by their carbon emissions, and then by their weight in the loan portfolio. The positions within the two indexes are averaged, and the sectors in the top quartile are considered carbon critical. The list of carbon critical sectors in 2022 contained electricity generation, industry, transport, retail and agriculture. Carbon critical sectors have accounted for 33-76% of the loan portfolio in Estonia in different years (see Figure A1.2).

Figure A1.3. Loan positions of the most carbon-critical sectors



Sources: European Environmental Agency, AnaCredit database, Eesti Pank calculations

More detailed observation of the position of carbon critical sectors in the loan portfolio shows the energy sector to be most exposed to transition risks at 6% of the whole loan portfolio, followed by production of crops and animals at 4% of the portfolio, transportation and storage at 4%, and wholesale at 3% of the portfolio (see Figure A1.3).

The third method of assessment is Loan Carbon Intensity (LCI), which points the focus directly at the loan burden of particular economic sectors, and assesses the carbon intensity of each euro borrowed. The LCI shows how many grams of carbon are emitted by each economic sector per year for each euro borrowed, as $LCI_{jt} = \text{Emissions}_{jt} / \text{LoanStock}_{jt}$, where j indicates the economic sector

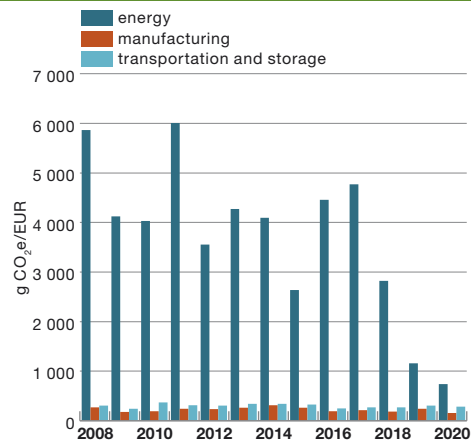
²⁵ European Commission A Clean Planet for all A European long-term strategic vision for a prosperous, modern, competitive and climate neutral economy. November 2018.

and t is time. The data show that the carbon-intensity indicator for loans in recent years has fallen substantially for the sectors with the largest emissions. It is reasonable to focus here on the sectors with the largest carbon emissions, as the LCI indicator is not directly comparable across sectors. The exposure of the Estonian banking sector in international comparison measured by the LCI indicator is however quite similar to that in other European countries. Sectors with high LCI indicators accounted for 27.6% of the total loan portfolio of the banking sector in 2020.

Data from the European Environment Agency on carbon emissions for each economic sector have been used in calculating all three indicators. This means the analysis considers only the exposure of the banking sector to transition risks that come directly from the carbon emissions of the clients of the banks, or scope 1²⁶.

The analysis is based on detailed aggregate loan data from the banks and data on carbon emissions by industry, and shows that the exposure of the Estonian banking sector to transition risks is considerable, but of a similar magnitude to that in other countries in the euro area. The three assessment methods find different results, as the carbon critical sectors assessment finds that 43% of the assets in the corporate loan portfolio were exposed to transition risk in 2020, loan carbon intensity finds 27.6% were, and the calculation for sectors affected by climate policy returns 21%.

Figure A1.4. Loan carbon intensity



Sources: European Environmental Agency, AnaCredit database, Eesti Pank calculations

26 The greenhouse gas emissions from the activities of an organisation or company are divided into three scopes: scope 1 is for direct emissions from sources owned or controlled by the company such as production; scope 2 is for indirect emissions from the energy purchased; and scope 3 is for all other indirect emissions that occur as a result of upstream or downstream activities in the company's value chain.