EESTI PANK

FINANCIAL STABILITY REVIEW

2
2019

The Eesti Pank **Financial Stability Review** is released twice a year. The **Financial Stability Review** is Eesti Pank's main publication analysing financial stability, and it contains an assessment of the risks to the stability of the financial system, and an outline of the macroprudential measures taken by Eesti Pank.

Financial stability means the smooth functioning of financial intermediation under both normal and unexpectedly adverse circumstances. The aim of macroprudential policy is to increase the resilience of the financial system and to avoid systemic risks to financial stability building up. Macroprudential measures help reduce the damage caused by a financial crisis to the non-financial economy.

The **Financial Stability Review** covers the main areas of risk and identifies possible systemic risks. As the Estonian financial system is largely bank-based, the main focus of the analysis is on risks and vulnerabilities that could substantially harm the Estonian banking sector or affect its activities.

The **Financial Stability Review** is available at
https://www.eestipank.ee/en/publications/series/financial-stability-review

Review by Eva Branten, Gaili Grüning, Silver Karolin, Jana Kask, Raido Kraavik, Merike Kukk, Madis Laas, Natalia Levenko, Taavi Raudsaar, Indrek Saapar, Ulla Tischler, Jaak Tõrs

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EESTI PANK'S ASSESSMENT OF FINANCIAL STABILITY

Faster deterioration than expected in the external environment has led to darker clouds gathering over Estonian businesses that may in future cause problems with servicing loans. The most recent data show the financial performance of companies is still strong and there are very few problem loans. Even so, the sharp weakening in the external environment and increased pessimism among companies give grounds for believing that their position will deteriorate in the coming months. The first signs of cooling in the Estonian economy are apparent in the labour market, and it can be expected that wages will rise more slowly in the years ahead. The adjustment of the labour market to the weaker economic environment will take time however, causing tensions for companies as the continued rise in wage costs will need to be covered from profits. The risk has increased that some companies will lose so much competitiveness that their ability to service their loans will suffer a blow.

The borrowing behaviour of households has not been substantially affected by the increased uncertainty in the global economy. The good state of the labour market and continuing rapid growth in wages have meant that confidence has remained strong among households. Demand for housing has also remained robust, and the stock of housing loans is growing rapidly. Although strong demand for loans is in line with rising wages, slower growth in the economy could cause unemployment to rise. Rapid growth in credit causes the worry that some borrowers have not taken full account of the risks and may face difficulties servicing their loans if they were to lose their jobs.

The real estate and construction sector continues to grow rapidly. Strong development means that a lot of new residential and commercial real estate will be added to the market in the near future. There is a risk though that with the economy cooling there will not be sufficient demand for the additional residential and commercial space. This means that some development projects may be knocked back. Cash flows from investments in commercial real estate may also be interrupted by a rising vacancy rate. The build up of risks in the real estate sector may harm the quality of the loan portfolio of the banks substantially, as a very large share of loans have been granted for commercial property development.

As the Estonian banking sector has strong interlinkages with the Swedish banking groups, the risks facing those groups may be transmitted to the Estonian financial sector. Although the banks in Estonia mainly fund themselves from domestic deposits, the loan supply in Estonia is also affected by the terms on which the parent banking groups are able to or want to supply funding to their Estonian subsidiaries. The risk remains for the future that the financial markets may consider the Swedish banks to be exposed to greater risks, as the Swedish economy faces the danger of structural risks being realised. Risks have been increased of late by suspicions of money laundering that have affected several banks operating in Estonia, which has had a negative impact on the share prices of the banking groups, though the price of market-based funding has remained favourable so far.

The main risks to Estonian financial stability	
A deterioration in the ability of companies to repay their loans Increased vulnerability because of global growth weakening	↗
A deterioration in the ability of households to repay their loans Increased vulnerability because of rising house prices and rapid growth in borrowing	→
A reduction in cash flows from investments in commercial real estate Increased vulnerability from strong development activity and weakening economic growth	→
A deterioration in the funding conditions of Nordic banking groups Increased vulnerability because of structural risks in the Swedish economy and suspicions of money laundering	→

1 = minor risk and 6 = major risk. The arrow indicates changes in the risk level from the assessment of April 2019

In the assessment of Eesti Pank, the risks to the functioning of the financial sector in autumn 2019 are low because of the resilience of the banking sector. The banks are strongly resilient to the realisation of risks as the capital level of the sector is high and profitability is good. This eases the risks to the financial system from the increased vulnerability. The loan portfolio of the banks has grown stably in recent years and financial intermediation has functioned smoothly. For the financial system to operate stably, it is important to maintain the resilience of the banks at times when the economy is doing well so that they can continue to finance the economy when it is doing less well.

MACROPRUDENTIAL MEASURES

Eesti Pank has introduced capital buffer requirements and requirements for issuing housing loans to reduce the risks to the financial sector (see Table 1). The systemic risk buffer and the additional buffers for systemically important institutions provide protection against an unexpected deterioration in the economic or financial climate. The housing loan requirements help avoid excessively fast growth in loans and increase the resilience of households and banks.

As a new macroprudential measure Eesti Pank introduced from 30 September 2019 an average risk weight floor of 15% for the mortgage loan portfolios of banks that use the internal ratings method for calculating risk-weighted assets. The weighted average risk weight at these banks has fallen substantially in recent years, while the growth in housing loans has remained fast and the systemic risk has increased. The aim of the measure is to stop the average risk weight falling any further and to ensure the resilience of the banks to the risks associated with housing loans. If risk weights were to continue falling, this could lead to insufficient capital being held to cover the risks from housing loans.

Eesti Pank decided in the third quarter of 2019 to keep the countercyclical capital buffer rate at 0%. The debt of households continues to grow fast, while borrowing by companies has remained moderate. The rate of growth in debt in the non-financial sector is below nominal economic growth for the current year and the long-term average for nominal growth. As the rate of corporate investment is quite low, no substantial rise in debt growth is expected. If borrowing by the non-financial sector as a whole should pick up and the cyclical risks associated with it increase, Eesti Pank may still raise the countercyclical capital buffer rate.

Structural changes in the Luminor Group had an important impact on the Estonian financial system and on the macroprudential policy of Eesti Pank. Eesti Pank will in future take these changes into account when setting the rates for the systemic risk buffer and additional buffers for systemically important institutions. The macroprudential measures introduced by Eesti Pank at the consolidated level also affect the other Baltic states, making coordination and cooperation with the macroprudential authorities of other countries even more important than before for Eesti Pank.

Table 1. The macroprudential measures of Eesti Pank

Instrument	Requirement	From
Systemic risk buffer	1%	1 August 2016
Other systemically important institutions buffer		
Swedbank AS	2%	1 August 2016
AS SEB Pank	2%	1 August 2016
Luminor Bank AS	2%	1 July 2018
AS LHV Pank	1%	1 January 2019
Countercyclical capital buffer	0%	1 January 2016
Risk weight floor for mortgage loans*	15%	30 September 2019
Housing loan requirements**		
loan-to-value (LTV) limit	85%***	1 March 2015
debt service-to-income (DSTI) limit	50%	
maximum loan maturity	30 years	

* The floor is set for the average risk weight of the mortgage portfolio of credit institutions that use the IRB Approach.
* Share of loans breaching the limits may not exceed 15% of the volume of housing loans issued each quarter
** Up to 90% for housing loans guaranteed by KredEx

SLOWER GROWTH IN THE ECONOMY THREATENS THE ABILITY OF ESTONIAN COMPANIES TO SERVICE THEIR LOANS

The outlook for growth in the global economy is overshadowed by various risks that can impact the Estonian economy and the performance of companies negatively through trading partners. The outlook for growth worsening could hurt the profits and competitiveness of Estonian companies, and so also their ability to service their loans. This is made worse by the current state of the labour market, where slower growth in the economy will not necessarily reduce wage pressures. Companies being less able to service their loans could reduce the quality of the loans of the banks, hurting their financial standing and their ability to fund the economy.

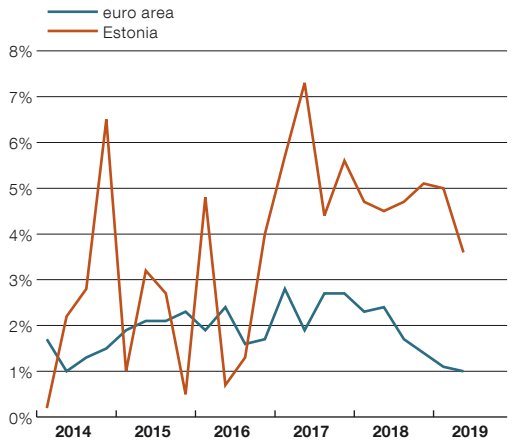
A weaker global economy will primarily affect exporting companies, but the impact will quickly pass on to other companies

The outlook for growth in the global economy is overshadowed by increasing uncertainty. Global trade and exports continue to be hurt by the worsening stand-off between the US and China, the extended uncertainty surrounding Brexit, geopolitical tensions in the Middle East and Asia, and trade tensions between the US and the European Union. The weakness in the external environment has pushed countries in many parts of the world to raise their government spending, increasing their already large debt burdens. The worries of investors about the outlook for the economy and the expected easing of monetary policy have been expressed in a sharp fall in the interest rates on bonds and relative volatility in share prices. To support growth in the economy and restore inflation rates, central banks have started to ease monetary policy again.

The cooling in the global economy reaches Estonian companies through Estonia's main trading partners. Growth in the euro area economy is being restrained largely by the weakness of the industrial sector (see Figure 1). This is primarily a consequence of weak foreign demand, which has seen export orders fall quickly. As the exporting sector contributes a great deal to growth in the German economy, Germany is threatened by recession. Things are made harder for Estonian companies that export to Sweden by the slower growth in the Swedish economy and by the weakening of the Swedish krona. Growth is also slowing in the economies of Estonia's other main trading partners.

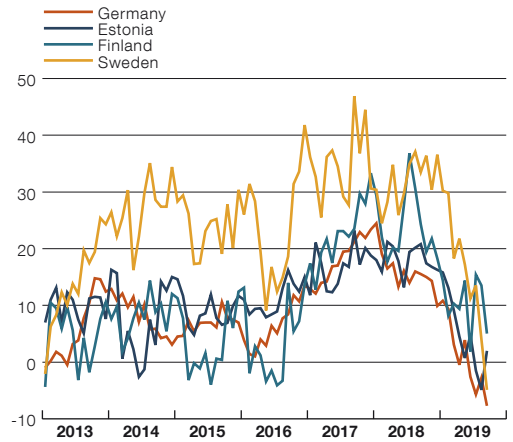
Estonian exporters have so far coped relatively well with the deterioration in the external environment, but their revenues are going to be affected increasingly in future. The growth in Estonian exports has slowed throughout 2019, though by less than growth in foreign demand has. However, there has been a sharp drop since June in output volumes in manufactur-

Figure 1. Economic growth in Estonia and the euro area



Source: Eurostat

Figure 2. Production expectations in manufacturing



The index shows the balance of companies expecting production to increase or decrease
Source: European Commission

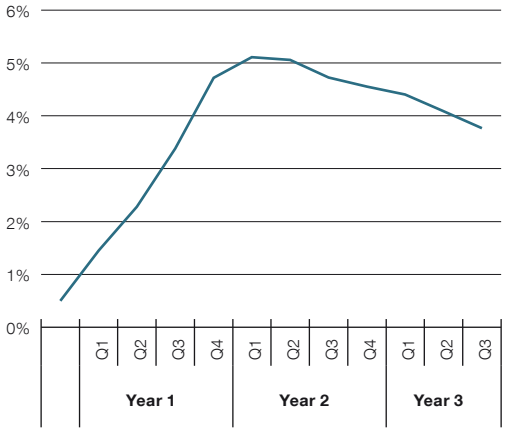
ing, which is one of the main exporting sectors[1]. Expectations of growth in the output of industrial companies have fallen even further (see Figure 2). This suggests that although the financial results of industrial companies still remain relatively good and the volume of problem loans very small, the position of companies and their ability to service their loans could deteriorate in future. This could potentially have a relatively large impact on the loan quality of the banks, as loans issued to industrial companies account for more than 14% of all corporate loans. Furthermore, the rate of overdue loans at industrial companies has historically been relatively high in comparison to other parts of the economy. At the time of the global economic crisis in 2009 for example, the share of overdue loans in the industrial sector reached 13%.

Weaker foreign demand can quickly and substantially harm the ability of exporting companies and of companies serving the domestic market to service their loans in a small and open economy like Estonia's. During the last global economic crisis the volume of overdue corporate loans grew very fast and peaked at 10% of all corporate loans. The external and domestic imbalances of the Estonian economy are now substantially smaller than they were prior to the last crisis, and companies have larger financial buffers.

How a decline in foreign demand would affect the loan quality of the banks today can be estimated from earlier data. The Eesti Pank macro model shows that a fall of 20% in foreign demand, which is similar to that which took place during the global economic crisis of 2009, would under current circumstances lead the economy to shrink by around 11%. The credit risk model for the banking sector shows that the share of corporate loans overdue would in consequence rise from 0.7% now to around 5% (see Figure 3). In this scenario the value of loans overdue would peak by the end of the first year after the drop in foreign demand. This means the impact of foreign demand on loan quality would again be fast and fairly broad.

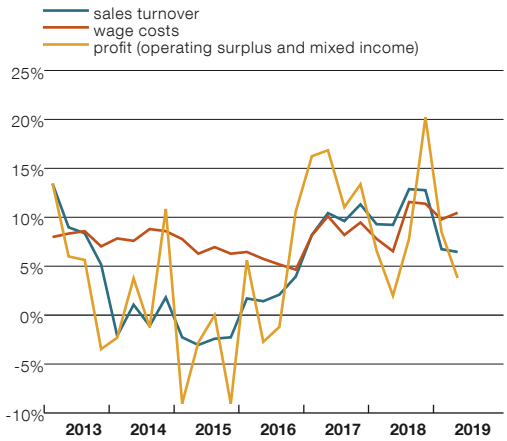
As the Estonian economy is doing well, the financial results of companies in the first half of 2019 were mainly quite strong, though companies are notably more pessimistic than they were a year ago. The yearly growth in corporate sales revenues slowed to around 6% in the second quarter (see Figure 4). Wages continue to rise rapidly, by around 10% a year, and although slower growth in the economy is likely to ease wage pressures, they will probably remain relatively high in future. The growth in corporate profits slowed in consequence to just a few per cent. Confidence has deteriorated sharply in recent quarters in industrial and construction companies. The estimates of retail and service companies for orders in the months ahead have also fallen notably. There has been some increase in the share of companies that consider financial

Figure 3. The share of corporate loans overdue in the risk scenario of a fall in foreign demand of 20%



Source: Eesti Pank

Figure 4. Corporate sales turnover, wage costs and profit



Source: Statistics Estonia

1 Not all of the reduction can be put down to the decline in foreign demand, as it is partly a consequence of sector-specific factors.

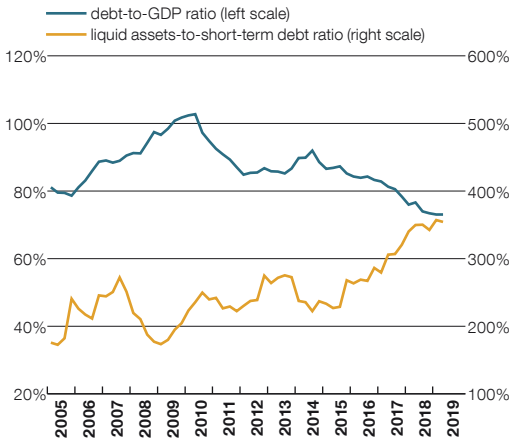
problems to be the main factor inhibiting business activities. However, the payment behaviour of companies has been exemplary as the share of companies with payment difficulties seen in overdue payments to suppliers, tax debts or insolvency is small. It will become clear in the coming quarters whether the increased uncertainty will be justified by the financial results of companies and whether problems will arise in loan repayments.

Increased financial buffers allow companies to survive any short-term deterioration in the business environment better than before

The ability of Estonian companies to finance their activities from their own funds has increased, and their capacity to cope with short-term economic shocks has consistently improved. Corporate liquidity remains high, supported mainly by deposits, which increased in the first half of 2019 as they have in previous years. The total liquid assets[2] of the corporate sector exceed short-term debt liabilities by a factor of around 3.5 (see Figure 5). However it is not reasonable or possible for companies to survive for a long time using only their financial buffers. The corporate sector as a whole should have sufficient liquid assets to cover constant ongoing expenses for only around half a year. It should also be noted that financial buffers are not equally distributed between companies. The growth in corporate debt was faster in the first half of 2019 at more than 4% than it was in the first half of 2018, though it still remains below the nominal growth in the economy, meaning that corporate indebtedness continued to decline.

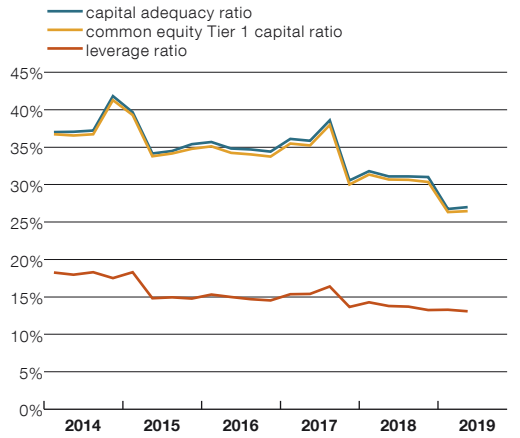
The banks operating in Estonia are so well capitalised that they are able to cope with some decline in the ability of companies to repay their loans (see Figure 6). The resilience of the banks is also boosted by their strong profitability, which allows them to maintain their level of capitalisation and cover small loan losses from profits. The capitalisation indicators for the largest market participants have been reduced, mainly by dividend payouts, though they are still several times above the level required. The reduction in capitalisation in some places at banks with smaller market share has come from the growth in risk assets associated with an expansion of activity. Some banks have also used additional capital to support their rapid growth.

Figure 5. Corporate indebtedness and liquidity



Sources: Eesti Pank, Statistics Estonia

Figure 6. Banking sector capital and leverage ratios



Source: Eesti Pank

Eesti Pank has set a systemic risk buffer

To reduce the vulnerability to possible negative developments in the global economy that arises because the Estonian economy is small and open, Eesti Pank has introduced a systemic risk buffer. The buffer applies to risk exposures located in Estonia and is set at a rate of 1%. Eesti Pank has also named four banks – Swedbank, SEB Pank, Luminor and LHV – as systemically important credit institutions and has set an additional buffer for them of between 1% and 2%, which strengthens the capacity of the banks that are important for the Estonian financial system to lend even when the economy is facing difficulties.

2 Cash, bank deposits, short-term loans granted, and listed securities.

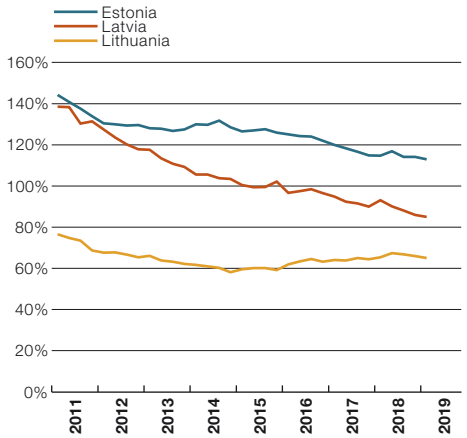
Box 1. The risks in the Latvian and Lithuanian banking sectors have not substantially increased

At the start of 2019, Luminor Group converted its Latvian and Lithuanian subsidiaries into branches, which were joined to the head office in Estonia. The change in the structure of the Estonian banking sector made the total assets of the sector some 1.4 times larger. Attention will in consequence need to be paid in future to developments in the Latvian and Lithuanian economies, and to factors that affect financial stability there.

Latvia and Lithuania have small and open economies, like that of Estonia, and so they are very exposed to slower growth in the global economy and to the behaviour of trading partners. Although companies in those countries are a little more optimistic than those in Estonia, the outlook for further growth is still seen as less rosy than earlier. Growth in the Latvian economy slowed to 2% in the second quarter of 2019, largely because of slower growth in the construction industry. The Lithuanian economy continued to grow at 4%, though companies expect growth to slow, mainly because of headwinds in the external environment.

The indebtedness of the non-financial sector in Lithuania has grown a little more slowly as a share of GDP, while in Latvia it continues to decline. Although Latvian companies have shown a little more interest in borrowing from banks, their debt levels remain among the lowest in the euro area (see Figure B1.1). Despite growing, the indebtedness of the Lithuanian non-financial sector is still the smallest in the Baltic states as a ratio to GDP. The quality of the loan portfolios of the banks in both countries has improved, and the share of loans not repaid by maturity has fallen in the loan portfolio. An exception to this is the growth in the share of loans not repaid on time by construction companies in Lithuania.

Figure B1.1. Non-financial sector indebtedness*



* Credit-to-GDP ratio
Sources: central banks

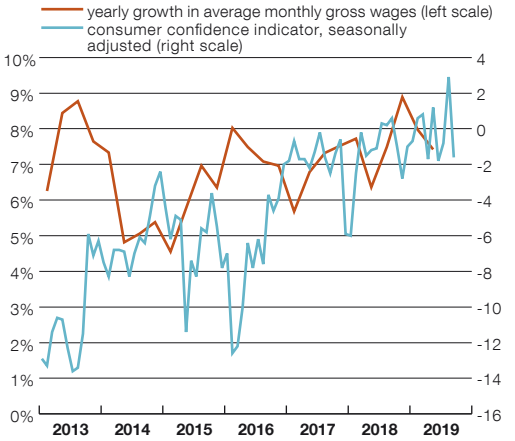
RAPID GROWTH IN HOUSING LOANS INCREASES THE RISKS TO FINANCIAL STABILITY IF THE ABILITY OF HOUSEHOLDS TO SERVICE THEIR LOANS DECLINES

Rapidly rising wages and strong confidence have kept demand from households for housing high, which could cause housing prices to rise faster. Housing is to a large extent financed by bank loans. The danger is that while economic conditions are good, households may not consider the risk of becoming unemployed, and so may overestimate their future financial position and borrow more than they can manage. If the economy deteriorates and the incomes of borrowers fall, they may have difficulties in repaying their loans. If real estate prices should fall at the same time, the loan losses of the banks may increase significantly. Should problems arise, the banks may limit the issue of new loans, which would make it harder for the economy to recover and for households to buy houses.

The level of systemic risk coming from the housing market is not currently high, but if borrowing continues to grow fast, imbalances will increase

Demand for housing has been supported by demographic developments in recent years[3], and also by the economic cycle, primarily the rapid rise in incomes and the strong confidence of households (see Figure 7). Yearly growth in the average gross wage remained strong in the second quarter of 2019 at 7.4%. Growth in the economy is forecast to slow, and as it does so wage growth should come down a little in future[4] and the optimism of households should wane. Even under these circumstances though, it may be assumed that conditions will favour demand for housing in the near term.

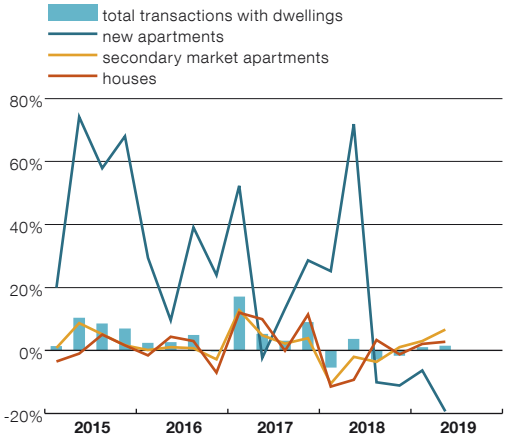
Figure 7. Growth in average wages and consumer confidence



Sources: Statistics Estonia, Estonian Institute of Economic Research, European Commission

Transaction activity remains strong in the housing market, though growth has stabilised. There were around the same number of sales transactions in the first half of 2019 as there were a year earlier. The number of transactions with new apartments declined a little from the high level of 2018 (see Figure 8). Demand for new residential space remains relatively strong though, and developers are providing quite a lot of it.

Figure 8. Annual growth in the number of transactions with residential real estate



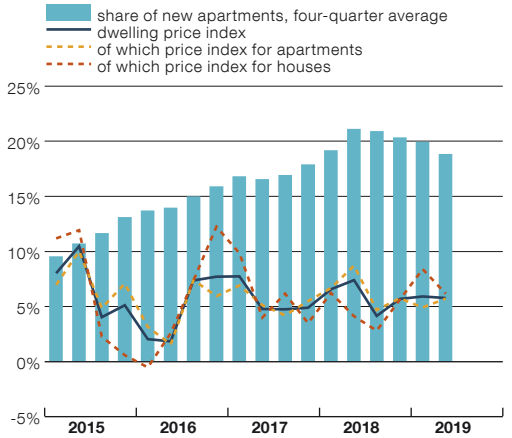
Source: Estonian Land Board

Housing prices are rising moderately. Over the past two years the average price of a housing transaction has risen on average by 5-6% a year. An increase in the share of transactions for new apartments played a large role in the rise in the average price of housing in earlier years, but since the second half of 2018, this share has fallen by a few percentage points (see Figure 9). The yearly growth in the average price for apartments in the secondary market in Tallinn, which is a relatively large and homogeneous segment of the housing market, has remained at the average rate of recent years of around 5-6%.

3 See the Financial Stability Review No 1/2017. *Box 1. Factors affecting demand and supply in the housing market.*

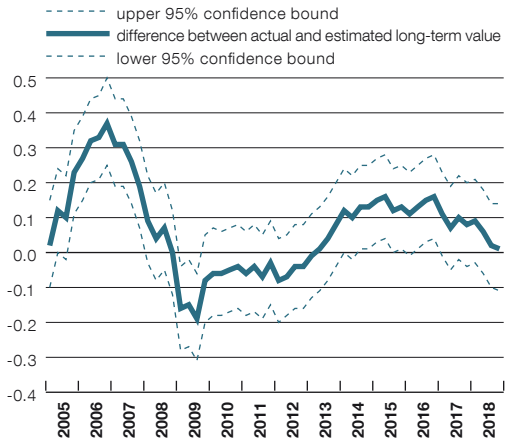
4 The Eesti Pank September forecast finds that the yearly growth in average gross monthly wages will average 5% in 2020-2021.

Figure 9. Annual growth in dwelling prices and share of new apartments in the number of apartment transactions



Sources: Statistics Estonia, Estonian Land Board

Figure 10. Housing market over or under-valuation in the Eesti Pank model



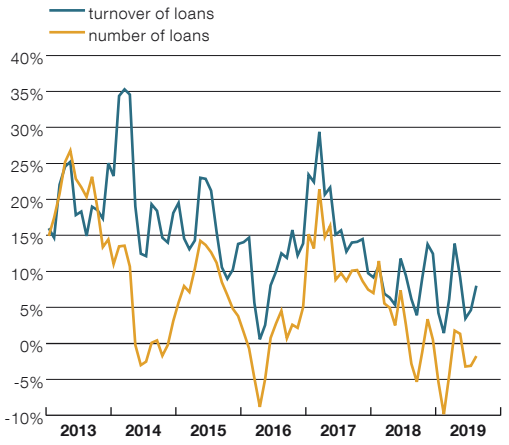
* The value 0.1 denotes overvaluation of 10%.
Sources: Statistics Estonia, Eesti Pank

Given the current state of the economy there is no major imbalance in the housing market. Housing prices were better aligned in 2018 than they were earlier with the level found from the fundamentals of the housing market such as incomes, interest rates on mortgages, or the number of dwellings (see Figure 10)[5]. It should be noted though that the fast growth in incomes in recent years may not be in line with the long-term development of the economy, which may affect assessments of imbalance in real estate prices.

Rising real estate prices mean that the size of the average housing loan has increased. As the number of transactions for housing has remained at the same level as that of last year, the number of new loans has not increased either. In the first half of 2019 the number of new loan contracts was 3.8% smaller than a year earlier (see Figure 11). It follows from this that the yearly growth of 4.7% in the volume of new housing loans came from an increase in the average amount borrowed, which in turn reflects the development of housing prices.

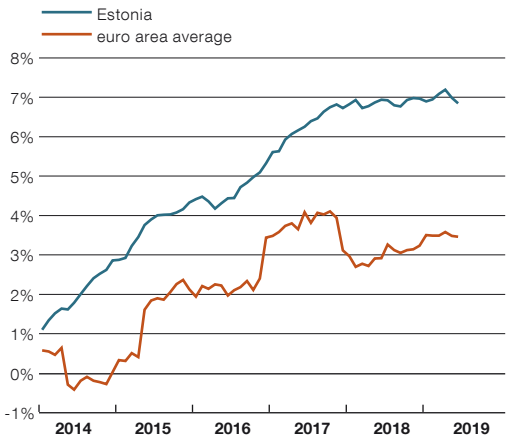
The yearly growth in the portfolio of housing loans has remained strong in the past two years at 7%. This rate is faster than in most other countries in the euro area and is around double the average for the euro area (see Figure 12). Rapid growth in borrowing is not in and of itself a problem if it is in line with the development of

Figure 11. Annual growth in new housing loans* issued to households



* three-month moving average
Source: Eesti Pank

Figure 12. Annual growth of household lending for house purchase



Source: European Central Bank

5 See the Financial Stability Review No 1/2019 for a description of the methodology. *Appendix Assessment of over or undervaluation of the real estate market with an econometric model.*

the economy and takes account of the sustainability of the income of the borrowers. If the rate of growth remains fast over a long time though, it means that systemic risk has increased. If borrowers overestimate their ability to pay when the economy is running well and take on excessive loans, the loan losses of the banks may later increase. This could pose a risk to financial stability as housing loans are as much as 41% of the loans issued by banks to Estonian companies and households, and are equivalent in value to 29% of GDP.

Households have become more resilient to risks, though their financial buffers are small

The indebtedness of households has not increased despite the strong growth in housing loans, as incomes have risen fast as well. Household debt as a ratio to disposable income stood at 70% at the end of the first quarter of 2019, and the debt-to-GDP ratio was close to 39%, which are a little lower than a year earlier (see Figure 13). Households in Estonia are less indebted than the average for the European Union, but in assessing the risks to the sustainability of the debt, it must be remembered that GDP growth in Estonia has in the past been much more volatile than the European Union average.

The risks from growth in loans are partially eased by growth in financial savings. Household deposits have grown consistently by around 10% for almost two years, which is much faster than loans. The financial buffers of households remain small in international comparison though, and the savings of households are distributed very unevenly.

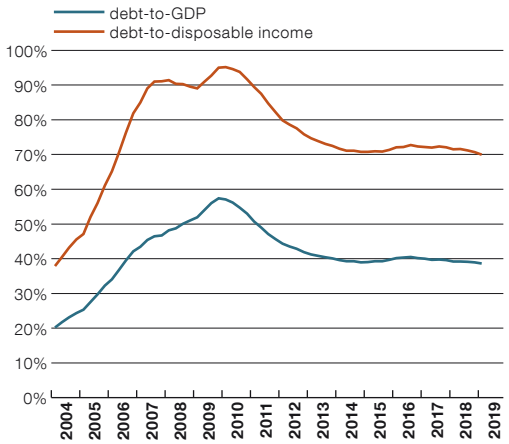
The debt burden of families with housing loans has declined in the past five years for most income groups. This has mainly been because the rapid rise in wages in recent years has raised the level of incomes, though this may not continue if the economy turns down. The exposure of households to the risks from their debt burden vary widely, depending not only on the level of income but also on savings and the amount borrowed (see Appendix 2). Households with smaller incomes are particularly sensitive to a fall in income.

The banks have maintained a conservative stance in issuing new loans. This has partly been made possible by the weakness of competition in the housing loan market, where two large banks issued 80% of new housing loans in the first half of 2019. The banks have not eased their lending standards and loan margins have risen slightly in the past couple of years. In 2017 the average interest rate on housing loans was 2.3%, but in the first eight months of 2019 it was 2.5%.

Eesti Pank has introduced macroprudential measures to reduce risks

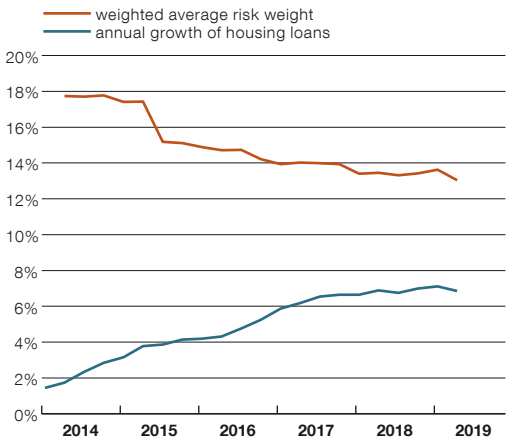
Eesti Pank has introduced an average risk weight floor of 15% for the mortgage loan portfolios of banks that use internal ratings for calculating risk-weighted assets. The measure

Figure 13. Household indebtedness



Sources: Statistics Estonia, Eesti Pank

Figure 14. Weighted average risk weight of the retail mortgage loans of the IRB banks and annual growth of housing loans



Sources: Finantsinspektsioon, Eesti Pank

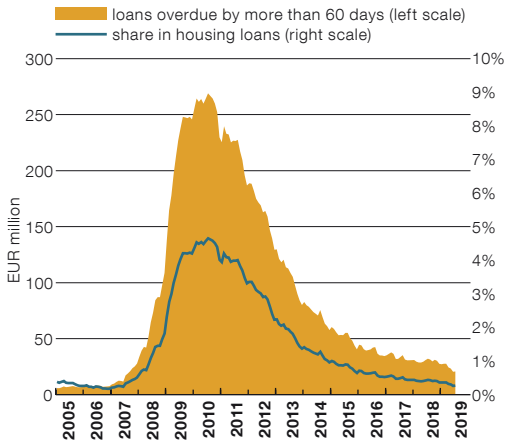
applies as of 30 September 2019. The measure was introduced because at a time when the growth in housing loans has been fast for some time and so systemic risk may have increased in consequence, the weighted average risk weight for mortgage loans issued by the banks using the internal ratings based (IRB) approach in Estonia has fallen significantly, dropping by a quarter from 18% to 13% over the past five years (see Figure 14).

The fall in the average risk weighting of the Estonian IRB banks reflects the favourable economic environment of the recent past, which has substantially reduced the volume and share of housing loans overdue in the loan portfolio (see Figure 15). However, indicators for the real estate market, the credit market and the economy as a whole do not show that systemic risk levels have fallen in the same way.

The aim of the measure is to stop the average risk weight falling any further and to ensure the resilience of the banks to the risks associated with housing loans. If risk weights were to continue falling while the economic climate remains favourable, this could lead to insufficient capital being held to cover the risks from housing loans. As the IRB banks account for a substantial part of the banking market in Estonia, a further fall in the risk weights could increase the risks to financial stability in Estonia.

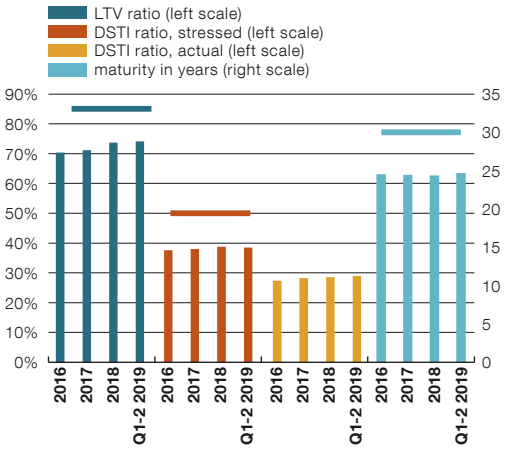
Eesti Pank has earlier set other regulatory requirements for housing loans issued by the banks. The housing loan requirements, which are limits on the loan-to-value ratio (LTV), the debt service-to-income ratio (DSTI), and the maximum maturity of loans, are intended to protect both borrowers and lenders from excessive risk-taking and to contain excessively fast growth in credit. The conditions on the loans issued by banks have remained within the permitted limits and the average ratios, and the distribution of loans by these has changed little over the past five years (see Figure 16). As the growth rate of new transactions has slowed in the housing market and the credit market and the lending conditions of the banks have remained the same, Eesti Pank does not currently consider it necessary to change the housing loan requirements. It is not impossible that the requirements will need to be tightened in future should credit growth accelerate.

Figure 15. Volume and share of overdue housing loans



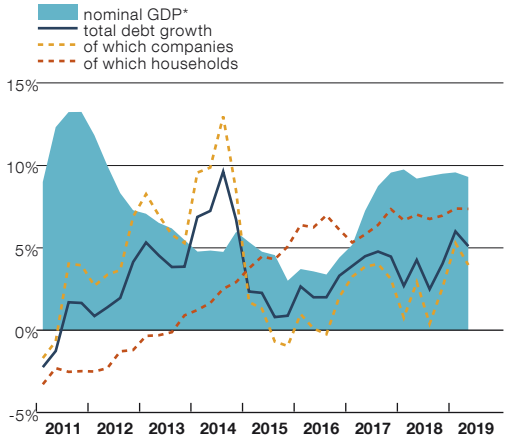
Source: Eesti Pank

Figure 16. Weighted average LTV and DSTI ratios and loan maturity



Sources: Finantsinspektsioon, Eesti Pank

Figure 17. Yearly growth of non-financial sector debt and nominal GDP



* four-quarter moving average yearly GDP growth
Source: Eesti Pank

Rapid growth in housing loans is currently not sufficient grounds for raising the countercyclical capital buffer above its current level of 0%. Although it is mainly cyclical factors that are behind the growth in housing loans, raising the countercyclical capital buffer rate is not an appropriate measure for addressing the risks associated with this growth under current conditions. The countercyclical capital buffer is applied to the total risk exposure of the banks, which means that raising the buffer rate affects lending equally both for rapidly growing housing loans and also for those corporate loan segments where growth is slower, and where faster loan growth could support investment. As the total debt of the non-financial sector is growing more slowly than GDP is (see Figure 17), Eesti Pank considers that the housing loan requirements and the risk weight floor for mortgage loans are sufficient to manage current risks from housing loans.

THE COMMERCIAL REAL ESTATE MARKET IS FACING THE RISK OF OVERSUPPLY

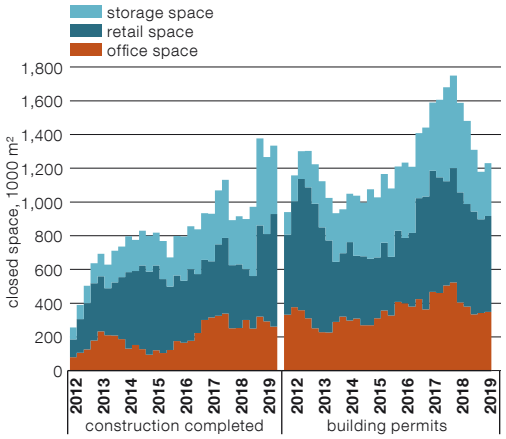
The Estonian commercial real estate market has been very active in recent years. Rental demand is very sensitive to the business cycle however, and it may decline as the economy grows more slowly. Developers react to this with quite a long lag, as real estate development takes years. If a project is not already covered by contracts during development, it may become uneconomical if demand declines. The sector is capital intensive and is largely funded by loans or other external funds. Collateral for loans can be hard to realise, because falling demand may seriously hurt the liquidity of a project and bring down sales prices. This means that problems in the commercial real estate market can cause loan losses, and this can cause banks to reduce the supply of credit.

No serious risks have yet appeared in the commercial real estate market and there are no major imbalances

Development work continues to be active and numerous new office, retail and storage spaces have been completed. Although fewer new construction permits have been issued this year than in the past two years, there have still been a lot issued, which reflects the continuing strong interest in the development of commercial premises (see Figure 18). This means that numerous new commercial properties will be added to the market in the near future. The share of new builds under development is falling though, as the reconstruction and expansion of existing buildings has become more and more popular of late. There has been a substantial decline this year in the share of new construction in storage facilities, and statistics for construction permits indicate that there is increasing focus on making better use of existing space for office and retail properties. This could indicate a desire among developers to adapt buildings to market expectations and demand in order to remain competitive.

There has been a notable increase in the floorspace of commercial buildings, but this has not yet caused difficulties in finding tenants. In consequence the share of floor space that is not covered by rental contracts remains very small. The vacancy rate for first class office buildings has even fallen in recent quarters and has been between 5% and 6%. Only the vacancy rate for retail space has risen a little, though still less than 2% of such space is currently not occupied. Rental prices for new commercial properties with a good location have become more affordable in recent years. This suggests that to a large extent it will be owners of older and poorer quality commercial properties that may face difficulties because of the addition of new commercial space.

Figure 18. The amount of new, rebuilt or enlarged commercial real estate, 12-month average



Source: Statistics Estonia

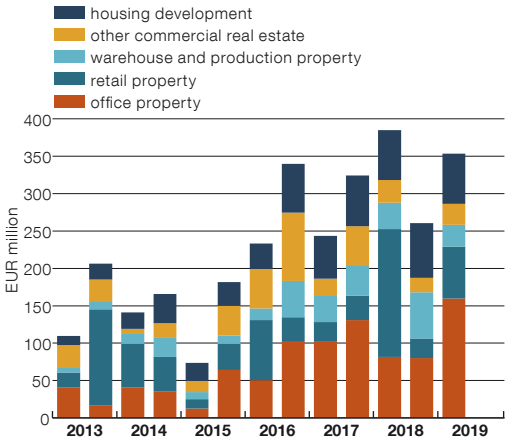
A great deal of interest remains in investing in commercial real estate that returns a stable cash flow. This has been aided by the strong demand for rental space that is typical in a favourable economic climate. Transactions for commercial real estate exceeded 100 million euros in the first half of the year, and according to forecasts, the value of transactions will remain at a similar level this year to what it was last year. More than half of transactions have been for industrial real estate, though there have also been many transactions for office and retail buildings. The return on investment in commercial real estate remains between 6.25% and 7.75% depending on the type of property, and has remained stable in recent years.

Foreign investors have also shown a lot of interest in commercial real estate that can

return a cash flow, and foreign capital covers around half of the value of transactions[6]. Foreign investors are brought in by the attractive returns in Estonia. The return on investment in commercial property in the Nordic countries has fallen below 4% in recent years, which means that it exceeds the return in Estonia by more than one third. A decline in the cash flow earned from commercial real estate would however cause difficulties for local investors in servicing their loans and may cause foreign investors to decide to exit the Estonian market, in which case the large role played by foreign investors could exaggerate the loan losses. This would increase the problem of realising collateral, because the commercial real estate market would lose liquidity and the potential sales prices of collateral would fall.

The banks remain ready to fund commercial real estate development projects and purchases. They have been particularly keen to lend to real estate companies to fund office space, but they have also funded a relatively large amount of retail space and other commercial property (see Figure 19). The yearly growth in the stock of loans issued to real estate companies for commercial property has been around 5% in recent years. Although the average interest margin on loans has risen a little (see Figure 20[7]) and the banks have become more cautious about funding commercial real estate, access to loans remains good and prices favourable.

Figure 19. New loans issued for commercial real estate



Source: Eesti Pank

Figure 20. Growth of commercial real estate loans and the average interest rate

Source: Eesti Pank

However, loans taken from banks operating in Estonia make up less than half of the debt liabilities of real estate companies and this share has declined in recent years. Companies largely finance their activities from own funds, meaning the financial leverage of the sector has declined[8]. This means that companies are bearing a larger share of the risks of projects themselves, but it also means that active development can continue in the market even as the banks take a more cautious stance, and so the market may overheat.

The market for commercial real estate has worked well, but the risk remains of excess development leading to more space being added to the market than there is demand for. Although the rate of development has so far matched demand well, slowing growth in the economy could cause demand to fall, and so some developers may have difficulty servicing their loans. Excess supply could cause the current owners of income-producing commercial real estate to lose rental income, and this would harm their solvency.

6 Source: https://www2.colliers.com/et-EE/Research/Tallinn/Baltic-Investment-1HY-2019

7 The sharp drop in the loan stock in autumn 2017 was caused by one bank moving a substantial share of its loans to the portfolio of its foreign parent bank.

8 See Financing of the Economy 2019, *Box 2. The financing of real estate companies.*

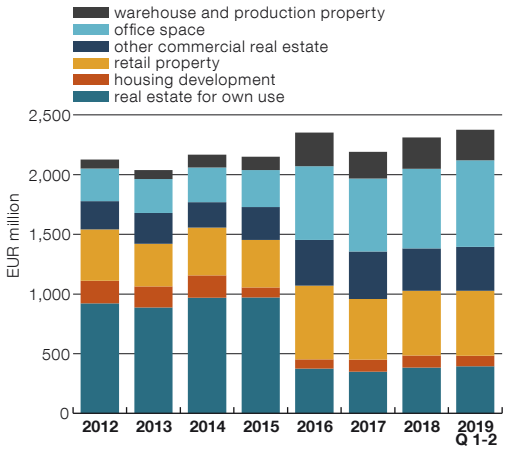
If rental demand weakens, the quality of the loan portfolio of the banks may deteriorate substantially

Although the financial results of real estate companies have so far been good, profit has fallen noticeably as a share of sales revenue in recent years. One cause of the rapid rise in gross spending has been labour costs, which have risen by an average of 10% a year in recent years. Lower profits mean that companies have smaller buffers available for coping with problems if the outlook for the economy deteriorates, and so their ability to repay their loans will decline faster. Real estate companies usually face problems with servicing their loans when the business cycle turns downwards. In the economic crisis a decade ago, the share of non-performing loans to Estonian real estate and construction companies reached 14%, which was double the average for other companies.

Although a lot of commercial real estate transactions are funded from other sources, banks in the Estonian market are an important source of external financing. Loans issued to real estate companies to buy or develop commercial property exceed 2 billion euros in value, which is more than a quarter of all the bank loans issued to the corporate sector[9]. Real estate funds have invested some 280 million euros in Estonia, and pension funds have taken positions in real estate worth more than 200 million euros. The share of loans issued to the real estate and construction sector in the corporate loan portfolios of the banks is higher in Estonia than the European Union average[10], indicating that the banks in Estonia will be relatively vulnerable if the sector were to run into difficulties.

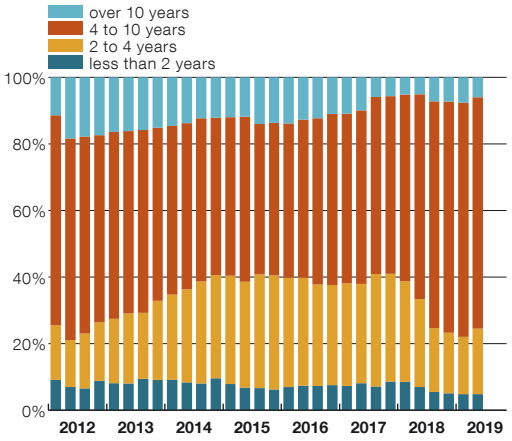
The portfolio of commercial real estate of the banks is fairly well diversified. The largest share of loans have been granted to fund office and retail space (see Figure 21). It is still apparent though that some banks have focused on specific sections of the commercial real estate market. The vulnerability of the banks is being reduced by the use of buildings that are already earning a cash flow as additional collateral for funding projects that are in development.

Figure 21. The stock of commercial real estate loans by purpose



Source: Eesti Pank

Figure 22. Commercial real estate loan term at issuance



Source: Eesti Pank

That vulnerability is increased if loans granted for development have relatively long maturities. A large share of the loans are issued for more than four years. The share of long-term loans in loans issued to real estate companies has increased in recent years (see Figure 22). This means that the loan quality of the banks may decline if the strains in the commercial real estate market continue over the medium term.

9 Bank loans to the construction and real estate sector total 3.1 billion euros, or 41% of the bank loans issued to non-financial companies.

10 EBA Risk Dashboard Q1 2019.

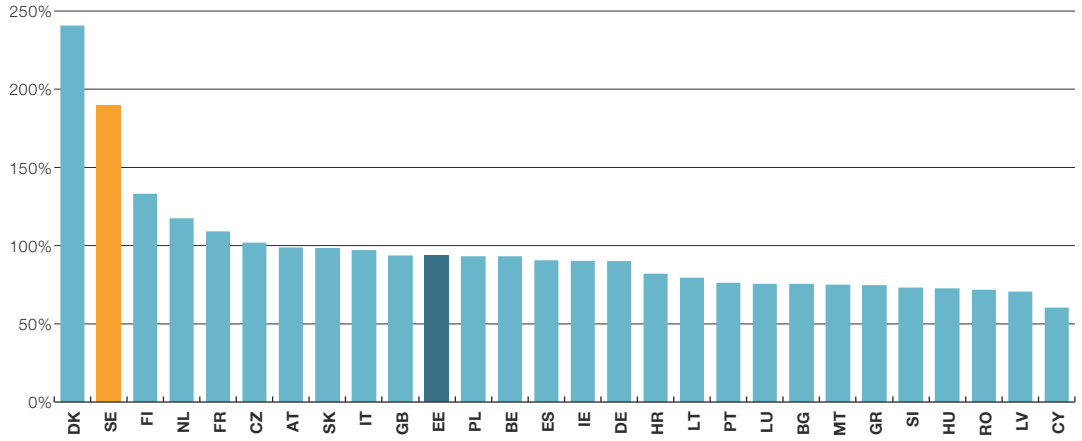
Eesti Pank does not currently consider it necessary to introduce any additional macro-prudential measures

Eesti Pank has so far not considered it necessary to introduce specific measures to reduce the risks coming from the commercial real estate market. There is however a systemic risk buffer, which makes the banks more resilient to systemic risks. One reason for introducing the buffer was the highly concentrated nature of the loan portfolios of the Estonian banks. The buffer helps to reduce the potential negative impact that comes from such a large share of loans being advanced to the construction and real estate sector. The total impact is further reduced by the additional buffer that is required of systemically important credit institutions because of their importance in the Estonian financial system.

THE RISKS TO THE SWEDISH BANKING SECTOR MAY AFFECT THE SUPPLY OF LOANS IN ESTONIA

Banking in Estonia is tightly connected to developments in the Swedish banking sector, as subsidiaries of Swedish banks account for two thirds of the market in Estonia. Although those banks largely fund themselves in Estonia through local deposits, the connection to Swedish units could affect the loan supply in Estonia. If international investors were to reassess the risks to the economy or banks upwards in Sweden, the conditions under which the banks access funds could worsen quickly and substantially. Group-level liquidity management also makes it possible that if needed the funding raised in Estonia might be reallocated to other parts of the group. This would reduce the loan supply in the Estonian market and make funding the economy more expensive.

Figure 23. Loan-to-deposit ratios as at 31.12.2018



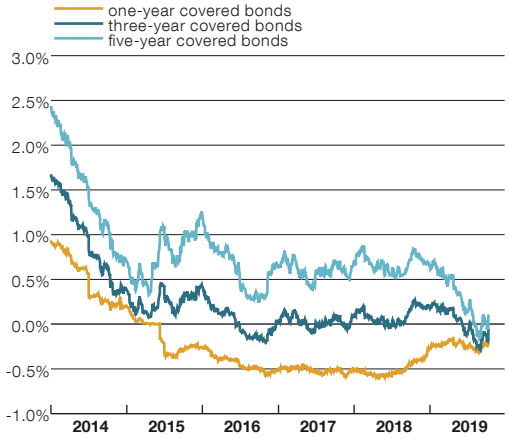
Source: European Central Bank

The funding conditions of the Swedish banking groups have so far remained good

The business model of the Swedish banking groups is built to a large extent on market-based funding. One reason is that their share of deposits is relatively small in international comparison (see Figure 23) because Swedish households put a large part of their savings into investment and pension funds, meaning a smaller proportion of their savings reaches banks as deposits. Although the deposits of the Swedish parent banking groups have grown in recent years, their financing model is still largely based on funds from financial markets. This means the financing conditions of the banks depend to a large scale on developments and sentiments in financial markets.

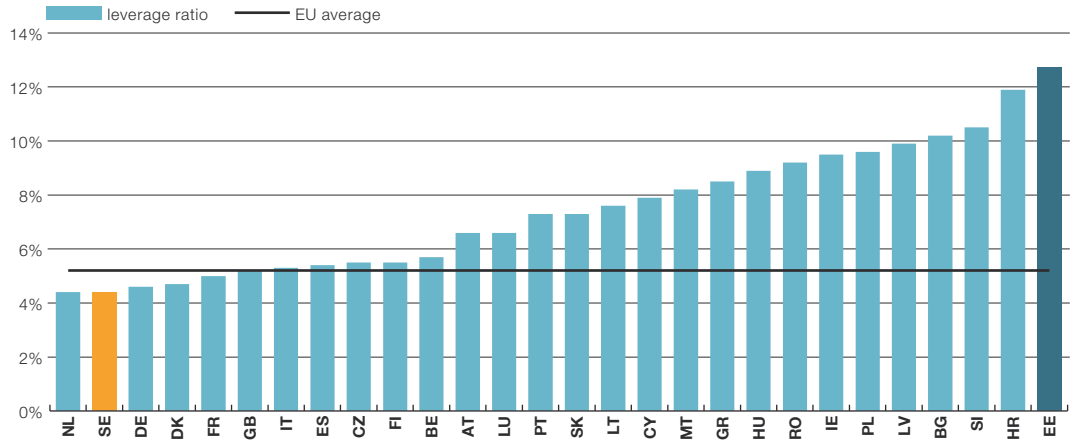
So far the financial markets have backed the Swedish banks. Along with changes in the yield curve for sovereign bonds, the market interest rates on the bonds of Swedbank and SEB have also fallen. The interest rates on longer term covered bonds are notably below where they were at the start of 2019. Market interest rates on three and five-year covered bonds were negative in June to August, like those on one-year covered bonds (see Figure 24). Market interest rates on unsecured bonds have also come down in the past six months. This means the cost of market-

Figure 24. Average yields to maturtiy of the covered bonds of the Swedbank and SEB banking groups



Sources: Bloomberg, Eesti Pank calculations

Figure 25. Leverage ratios of banking sectors



Source: EBA Risk Dashboard 2019 Q1

based financing has become even more favourable for the banks. The suspicions of money laundering have not yet had any significant permanent impact on the market interest rates for bonds. The share prices of the banks have fallen though. Despite this, the reputational risk from suspicions of money laundering could make the financing for the banks more expensive and less accessible in future.

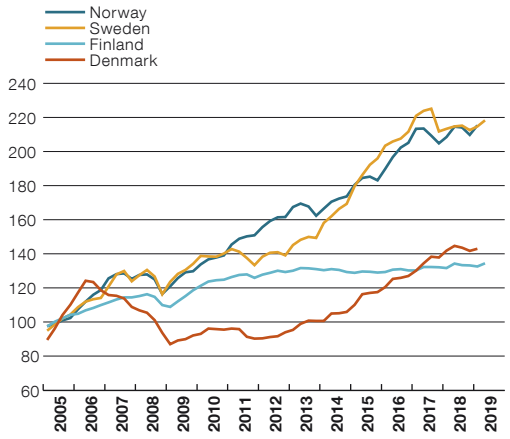
The level of own funds of the Swedish parent banks, which reflects the ability of the banks to cope with less favourable economic conditions, has remained relatively high in international comparison at 20-21% of risk exposures. Equally, overdue loans have been at low levels for some time already and this translates into lower model-based risk assessments. The capitalisation of the banks seen in terms of total assets is at the same time rather more moderate in international comparison (see Figure 25). Although the share of own funds exceeds the European Union required level of 3% of unweighted assets, the indicators for financial leverage of both SEB and Swedbank groups are in the lower group of the European banks at 4.6% for SEB and 4.8% for Swedbank. The mandatory capitalisation of the banks has been strengthened by the decision of the Swedish financial supervisory authority in September 2019 to increase the countercyclical buffer requirement applicable to loans issued in Sweden by 0.5 percentage point to 2.5%. The increased rate will come on top of the earlier buffer requirements.

The profitability of the banks is supported by their low loan losses and the low cost of funding that arises from the general interest environment. The return on equity rates of the SEB and Swedbank groups have remained at close to 15%. The liquidity of the banking groups has also remained good. The total liquidity coverage ratios for Swedbank and SEB exceed the 100% mark.

The current operating environment of the banks has been favourable, but uncertainty about the future has increased. Economic activity remained strong in Sweden in the first half of the year. Consumer confidence has been supported by the high employment rate. Inflation has remained at close to its target of 2%. In anticipation of uncertainty in the external environment and the adjustment of the domestic economy, the central bank cut its economic forecast for growth in 2019 to 1.5%, and decided in September to leave the repo rate at -0.25%. The possible impacts of political decisions including Brexit and trade agreements are among the factors adding to uncertainty about developments in the external environment.

The structural risks in the economy have not substantially diminished. One of these is the high levels of indebtedness of Swedish households, which may make the economy less able to adjust. Any decline in household incomes or confidence would at first probably not affect their ability to service their loans so much, but may lead to a fall in consumption. This however would

Figure 26. Price indexes of residential real estate in the Nordic countries (2005 = 100)



Sources: statistical agencies, Valueguard, Real Estate Norway, Eesti Pank calculations

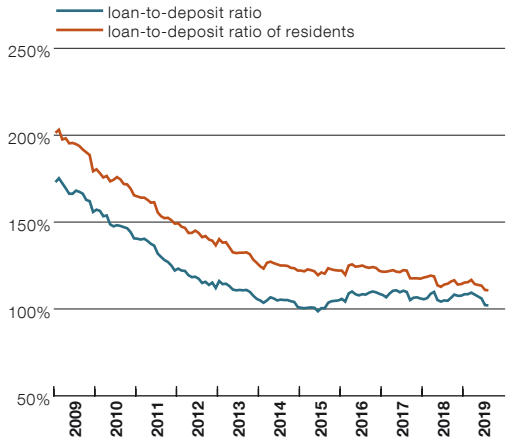
Figure 27. Lending growth and interest rates on new housing loans in Sweden

Source: Statistics Sweden

reduce corporate revenues, which would make it harder for companies to service their obligations, and this in turn would then affect both banks and households.

Household debt levels remain high even though debt has been growing more slowly. Debt increased rapidly together with house prices up until the middle of 2017 (see Figure 26), but more recently the growth has been subdued (see

Figure 28. Loan-to-deposit ratio



Source: Eesti Pank

Figure 27). House prices are considered to have risen more slowly in recent years because of the increase in building work and because supervisory measures have pushed lending policies to tighten[11]. Household debt has been growing at a slower rate, but the debt burden has not come down. The debt of Swedish households has grown to 186% of annual income and the Swedish central bank forecasts that it will continue growing[12]. Furthermore, the largest banks in Sweden remain significantly exposed to other risks related to real estate, including those from commercial properties[13].

The large share of their funding that the Estonian subsidiaries derive from domestic deposits reduces the risks to the loan supply

Over the longer term the Estonian banks have become less dependent on their parent banks for additional funds. The loan portfolio of the banks is funded almost entirely from deposits in Estonia (see Figure 28)[14].

Although being part of a larger group may create extra risks for Estonian banks, it can also strengthen their resilience. This is the case if other units elsewhere in the group are able to

11 Loan to value (LTV) limit of 85%. Since June 2016, Swedish borrowers whose loan principal exceeds 70% of the value of the collateral have to pay at least 2% of the principal back each year on top of interest payments, while clients whose loan is 50-70% of the value of the collateral must pay at least 1%. Since March 2018, new borrowers taking loans that are 4.5 times their pre-tax income or more should pay off a further 1% of their loan.

12 For more see Riksbank, Financial Stability Report 2019:1.

13 Data from the EBA Risk Dashboard Q1 2019 show that more than 60% of the corporate loans issued by the largest banking groups in Sweden have gone to companies in real estate. This includes loans to housing associations.

14 As at the end of August 2019, resident deposits covered 89% of the total loan portfolio.

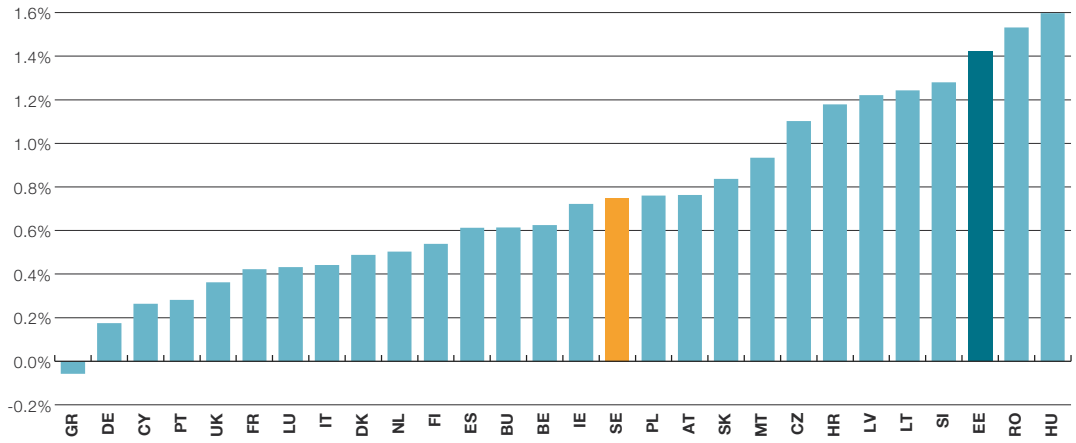
access funds at lower cost than those available locally, or to provide liquidity or capital support. The profitability of activities is also important in resource management at group level. If the group considers that operations in Estonia are more profitable in risk-weighted terms than those in other markets, the group-level funding limits should not particularly affect the Estonian subsidiaries[15].

The profitability of the banking sector in Estonia has remained strong (see Figure 29). The aggregate net profit in Estonia of the banking sector was more than 124 million euros in the first half of the year. Net interest income is supported by low interest expenses and both interest income and profitability more broadly have been supported by the low level of problem loans. Currently around 0.5% of the total volume of loans are overdue more than 60 days. The return on assets of the largest subsidiaries in Estonia continues to exceed the average for their groups[16]. This makes it a little less likely that contractions in group-level funding would reduce the loan supply in Estonia for at least as long as the risks in Estonia are not revalued.

Eesti Pank has set higher own funds requirements for the systemically important credit institutions operating in Estonia

The buffer rate for systemically important institutions (O-SII) is set to reflect their size, their complexity and their interdependence with other participants in the financial system. Since 2018 additional requirements for systemic importance have been applied at 2% to Swedbank AS, AS SEB Pank and Luminor Bank AS, and at 1% to AS LHV Pank. The buffer requirement applies to the total risk exposure of systemically important credit institutions, and it must be met with core equity tier 1 own funds and applies on top of other macroprudential requirements.

Figure 29. Return on assets of banks, 2018



Source: European Central Bank

15 See also Box 3 of Financial Stability Review 1/2016, on the impact on Estonian financial stability of the risks to the Nordic banking sector being realised.

16 It should be remembered that when comparing the results that some cost items are only reflected for one part of the group, though services are also provided to other parts of the group.

APPENDIX 1. HOW THE CHANGES TO THE PENSION SYSTEM AFFECT FINANCIAL STABILITY

A pension system can be described as a mechanism for collecting money from people throughout their working lives that is then paid out to them in retirement. Pension schemes can be divided into pay-as-you-go (PAYG) and funded pensions depending on their principles for collecting and managing contributions and payouts. The simplest type are the PAYG pensions, where the pensions of current pensioners are paid from current tax receipts. The contributions in funded pension schemes are individual, meaning that workers save and invest a part of their income and use the money they have saved up when they reach retirement. Pension systems are also defined as pillars, where the first pillar is a purely PAYG scheme, the second pillar takes personalised contributions from workers and employers, and the third pillar is a purely voluntary funded pension.

Until 2001 there was in effect only the first pillar pension system in Estonia. People had no substantial savings or investments, nor any experience of long-term investment. As the number of pensioners was set to rise in future and the number of taxpayers to fall, a pension reform was launched in Estonia. The mandatory pension funds system started on 1 July 2002, when the related clauses of the Funded Pensions Act came into force.

So that a critical mass could be achieved, it was made compulsory for everyone born in 1983 or later to join the new pension system, and to encourage saving a contribution of 4% from social tax paid was added on top of the 2% contribution from employers. This contribution formula of 2+4% has not been changed since then. Some 12,000-18,000 people a year have joined the second pillar over the past decade[17], and it now has a total of 738,000 people, and around 300 million euros a year are transferred into their investment accounts. As at 30 June 2019 the second pillar funded pension funds had invested 4.4 billion euros.

Expanding the options for investment

To allow unit-holders in pension funds to earn a better return, the mandatory pension fund system has gained more ways to do this since it was created. The investment limits for pension funds are set clearly in the Investment Funds Act, but the first major changes giving fund managers more freedom were made as early as 2008. After that, further major changes were made in 2011, 2015, 2017 and 2019, and individual smaller changes were made in other years too. The biggest change was that funds were allowed to have a 75% equity weighting from 2008, and a 100% equity weighting was permitted for funds from 2019. The investment limits for pension funds have gradually been reduced for other instruments as well, so from 2015 they were allowed to make transactions with precious metals and related securities, and they were allowed to invest more in unlisted securities. It has also become increasingly possible for them to invest in covered bonds, funds, real estate or foreign currencies, allowing them to disperse their risks more. Management fees have also gradually been reduced.

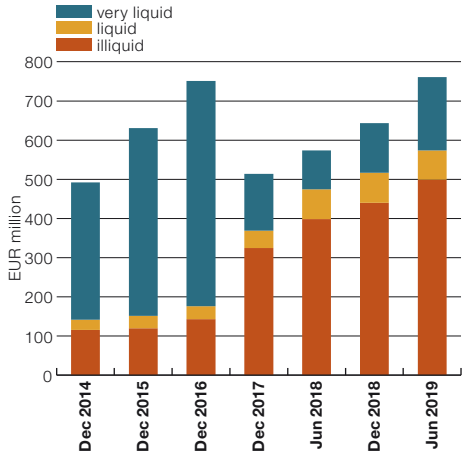
The investments of pension funds

Funds invest their assets following asset allocation principles, where they aim to get the best possible balance between risk and return, based on the risk appetite of the investor and the length of the investment. Pension funds invest for the long term, but they have to be able to make regular ongoing payouts too. The assets of pension funds are distributed geographically and across asset classes. Figure A1.1 shows the assets divided into three classes

17 See Financial Sector Structural Review 2019.

by liquidity, where very liquid assets are deposits and money market instruments, liquid assets are non-resident equity or bonds, shares listed in Estonia and shares in non-resident investment funds, and low liquidity assets are other assets including real property in Estonia, fund units and similar. Liquidity is taken to mean that there are sufficient transactions in the market with a given asset so that the investment can be cashed in within a reasonable time without losing any value.

Figure A1.1. The structure of the assets in Estonia of the pension funds, December 2014 - June 2019



Source: Eesti Pank

Liquid assets dominate among the foreign assets, while low liquidity assets do so among the domestic investments. Estonian pension funds have mainly invested in foreign assets, which account for 3.6 billion euros, or 83% of the aggregate portfolio[18]. The main reason for this strong focus on foreign assets is their greater liquidity. In the recent past there was a substantial leap in the share of more liquid assets and deposits after the financial crisis, though in recent years pension money has moved from deposits and funds to assets earning larger returns. The stock of foreign deposits is 20 million euros.

Investments in Estonia total 761 million euros, or 17% of the aggregate portfolio of pension funds. Unlike in foreign assets, it is assets with low liquidity that dominate in the Estonian portfolio, accounting for 499 million euros, or 66% of it, while the remaining 34%, or 262 million euros, is in deposits and other liquid assets.

The domestic investments of pension funds have grown strongly in recent years. From June 2018 to June 2019, the pension assets invested in Estonia grew by 32.5%, of which 100 million euros was invested and 87 million euros was deposited. This process may have been accelerated by the regulation of the Ministry of Finance that came into force in February 2018, under which the management fees of pension funds were linked to their investments to discourage pension funds from investing in other investment funds and to encourage them to own their investments directly through active fund management, including investments in Estonia[19].

The pension funds investing in Estonia have mainly invested in bonds, with 334 million euros, followed by units in investment funds at 153 million euros, and shares at 75 million euros (see Figure A1.1).

Pension funds have also invested to a smaller extent in financing the Estonian private equity and venture capital sector. This important market for Estonia has developed very fast in the past five years and domestic pension funds are estimated to have provided 8-10% of the aggregate funding portfolio of private equity and venture capital. On top of their role in providing funds, pension funds play an important role as a local institutional investor in encouraging foreign investors to enter the market for private equity and venture capital.

18 Of the foreign assets, 99% are invested in shares, bonds or fund units.

19 https://blogi.fin.ee/2018/01/pensionifondide-tasudest/

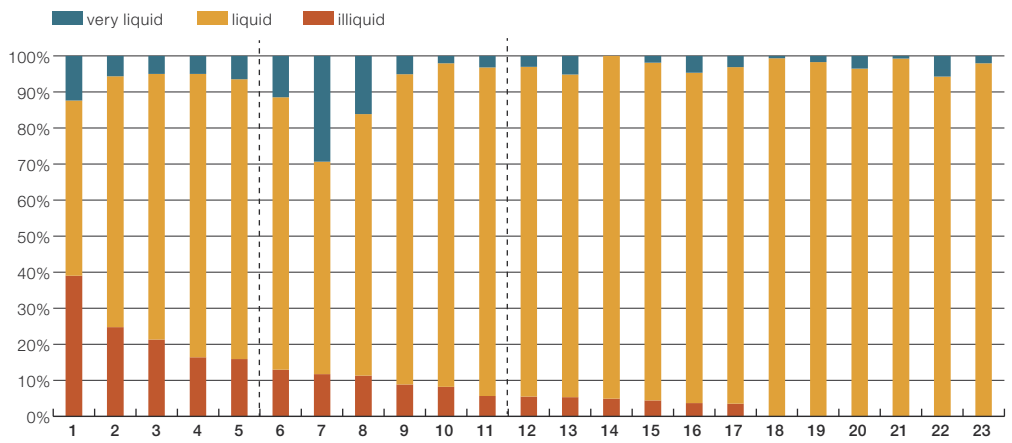
Real estate and banking are the economic sectors that play a very large role in the assets of pension funds. As investment volumes have increased, so the range of companies invested in has widened. At the start of the decade funding went mainly to infrastructure companies, but by now investment also goes into companies in finance, real estate, transport and more. The real estate sector also dominates among investment funds with 149 million euros. Most of the shares listed on the Tallinn stock exchange can be found in the equity portfolio, which also contains the equity of real estate companies to the lesser extent of 15 million euros. In total pension funds have invested more than two thirds of their Estonian assets in three main economic sectors, with real estate receiving 238 million euros, banking receiving 140 million euros, and energy 35 million euros. The long investment horizons of pension funds allow them to fund long-term projects if their liquidity and risk levels are appropriate.

The possible impact of the pension reform on investment

The proposed reform of the second pension pillar would force pension funds to change their current asset allocation. The principles of the pension reform announced by the Estonian government in 2019[20] would allow owners of pension shares to make extraordinary early withdrawals from the pension funds. Deposits are 207 million euros of assets and to make payouts of more than this amount, fund managers will have to exit their long-term investments. It should be technically possible over a reasonable period to liquidate the most liquid part of the assets, which are foreign assets and shares listed in Estonia, though this would probably mean a rise in management fees for the remaining assets. Exiting the investments made in low liquidity Estonian assets would require a long time and it is possible there would be substantial losses of value, because it would not be easy to sell the largest asset class, which is the real estate portfolio.

The speed and success of the sale of assets depend on the investment strategy of the given fund and where the assets had been invested (see Figure A1.2). It should be easy for the 12 pension funds at the right of the figure to make payouts, as at least half of their portfolios contain deposits and very liquid foreign assets, mainly shares. Six of the other 11 funds, would have to start planning to sell their less liquid assets over time, but they would probably be able to make current payouts by gradually selling their liquid assets. The pension funds that will have

Figure A1.2. The assets of Estonian pension funds by liquidity, 30 June 2019



Source: Eesti Pank

20 See https://www.valitsus.ee/et/uudised/valitsus-kinnitas-ii-penasionisamba-reformi-pohimotted

the greatest difficulty are those that have invested more than a sixth of their portfolio in assets with low liquidity, which are the five funds on the left of the figure. The aggregate assets of those funds are 1.5 billion euros, or 34.5% of the aggregate assets of all funds, and assets with low liquidity account for 300 million euros of that, so fund managers would have to make large and rapid efforts to exit the less liquid assets. A lot would depend on the ability of fund managers to plan, and also on the state of the market at any moment, as selling a real estate portfolio during a dip in the market could cause a lot of value to be lost.

The departure of a lot of clients would force pension funds to change their asset allocation and payouts would have to be spread out to avoid a run on the fund. To be able to cover the extraordinary payouts, most funds would have to increase their share of liquid assets permanently. In the shorter term these reorganisations would lead to one-off service fees, and in the longer term they would reduce returns. If a lot of people want to exit the pension system at the same time and a substantial share of liquid foreign assets were to go on sale, then the role of the mandatory part of the current pension system would rapidly come into question. The fund holders remaining in the pension system would have to bear the risks of Estonian real estate that cannot be distributed because of the small size of the market, and if they were to exit, asset prices would be put under pressure.

Making the second pension pillar voluntary raises questions that need to be considered before the changes are introduced if financial stability is to be maintained. Firstly, efforts must be made to protect the interests of fund investors if withdrawals of money from the second pillar pension funds force pension funds to sell assets at lower prices than planned, and the result of this is that those who remain in the fund suffer losses as well as those who have left. Secondly, some solution must be found to the negative impact that would arise if relatively fewer low liquidity investments were made in future, meaning the expected returns would be lower. Thirdly, some means or ways must be found of continuing to fund Estonian private equity and venture capital if pension funds no longer wish to invest in those instruments because of their low liquidity.

Compensating the losses of pension fund shareholders

Those saving in mandatory second pillar pension funds are protected against illegal, loss-making investments by fund managers. The Guarantee Fund Act defines how much of the losses of pension fund shareholders should be compensated if the pension fund manager has broken the law or the conditions of the pension fund or the terms of its prospectus. It is usually the pension fund itself that must compensate these losses, but if this is not done or is not possible, then the pension protection fund of the Guarantee Fund must step in. If separate investment accounts were opened for participants in the second pension pillar during the reform of the pillar[21], the pension protection of the Guarantee Fund would not be extended to transactions in that investment account. This would mean people wanting to start investing independently for their pension through an investment account would have to do consider that they would not be compensated by the state for incorrect and loss-making transactions.

21 See https://www.valitsus.ee/et/uudised/teise-pensionisamba-raha-iseseisvaks-investeerimiseks-luuakse-pensioni-investeerimiskonto

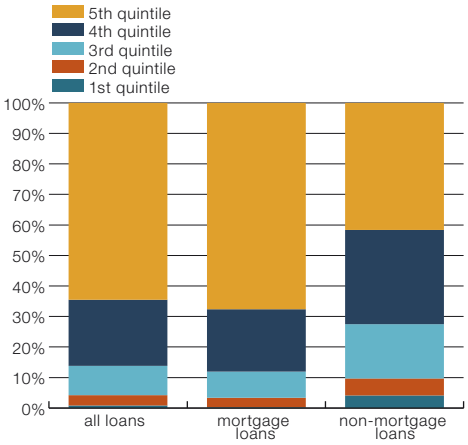
APPENDIX 2. DEBT IS VERY UNEVENLY DISTRIBUTED BETWEEN HOUSEHOLDS IN ESTONIA

Although loans to Estonian households have grown rapidly in recent years, indebtedness has not increased because incomes have risen fast as well. The ratio of the debt of Estonian households to GDP is also below the average for the euro area. How the debt and the debt burden are distributed between households is important though for the ability of households to repay their debt and for the loan quality of the banks. This analysis draws on data from the Household Finance and Consumption Survey[22] published in autumn 2019, which were collected in 2017[23].

The survey shows that debt is distributed very unevenly, and there are significant differences between the debt burdens of households with higher and lower incomes. Indebtedness has fallen in all income quintiles, but it remains high especially for households with lower incomes, given that their financial buffers are small.

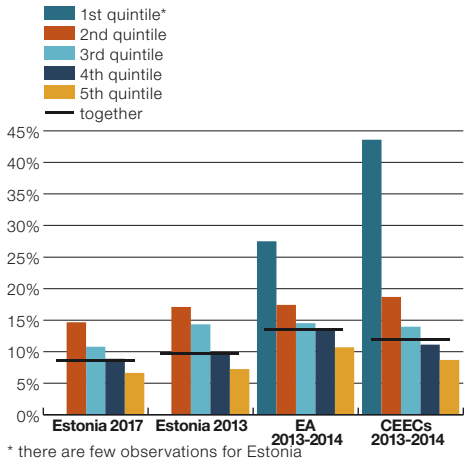
The total debt of Estonian households is distributed unevenly between households. It is estimated that more than 85% of the total debt is held by the 40% of households that make up the top two quintiles with the highest incomes, while the quintile with the lowest income holds only 1% of all debt (see Figure A2.1). A little less than half of households have a loan of some sort, but this varies widely across income groups, as only 15% of households in the quintile with the lowest income have a loan, while 80% of those in the highest quintile do.

Figure A2.1. Share of debt of households of different income quintiles in total debt of households



Sources: Eesti Pank, HFCS

Figure A2.2. Median value of the debt service-to-income ratio of households



* there are few observations for Estonia
Sources: Eesti Pank, HFCS

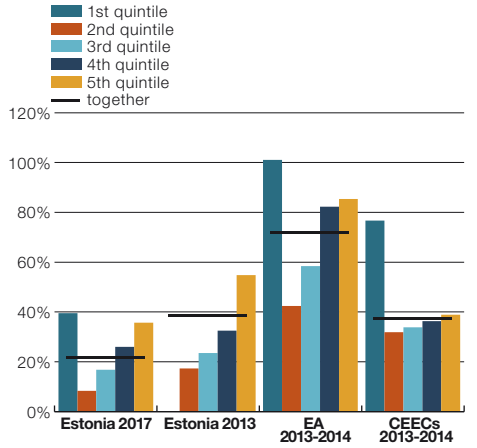
Although the debt of households with the lowest incomes is only a small part of the total debt, reducing the risk to financial stability from those loans, the debt burden is highest among the groups with the lowest incomes. The median value of the ratio of debt payments to income (DSTI)[24] indicates that the lowest quintiles spend a much larger share of their income on servicing their loans than the highest quintile does (see Figure A2.2). The total debt of households as a ratio to gross yearly income generally increases in the higher income quin-

22 The results of the survey are presented in an Eesti Pank Occasional Paper: Meriküll, J., Rõõm, T. *Estonian Household Finance and Consumption Survey: Results from the 2017 wave.* Eesti Pank Occasional Paper no 1/2019.

23 The data are compared with the 2013 household finance and consumption survey, the results of which are presented in an Eesti Pank occasional paper: Meriküll, J., Rõõm, T. *The assets, liabilities and wealth of Estonian households: Results of the Household Finance and Consumption Survey.* Eesti Pank Occasional Papers 1/2016.

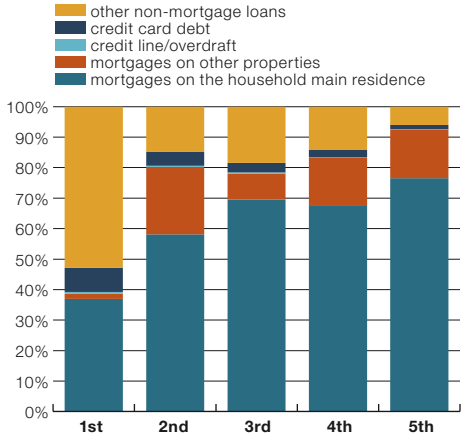
24 The figures here and onwards are calculated for households that have a loan.

Figure A2.3. Median value of the debt-to-income ratio of households



Sources: Eesti Pank, HFCS

Figure A2.4. Debt structure in different income quintiles

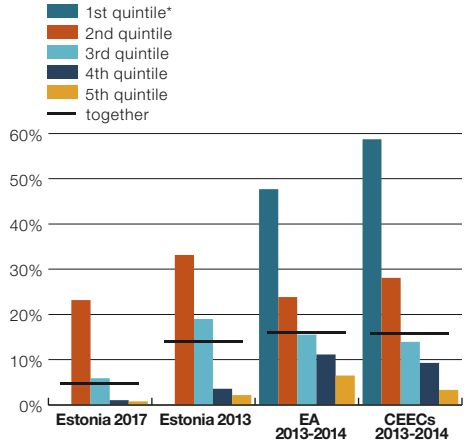


Sources: Eesti Pank, HFCS

tiles (see Figure A2.3). This is because the debt of the households with lower incomes is to a larger extent in the form of loans with shorter terms (see Figure A2.4).

The figures for the debt burden are lower than they were in 2013 for all income groups, and the debt burden has fallen relatively more for households with smaller incomes. The indicators for the debt burden of Estonian households are below the average for the euro area, but they are similar to the average indicators for countries in Central and Eastern Europe[25].

Figure A2.5. Share of households with a DSTI ratio above 30%



* there are few observations for Estonia
Sources: Eesti Pank, HFCS

In assessing the indebtedness of households and the risk to financial stability, it is important to know how many households there are that have very large debt burdens. It has been found that the likelihood of payment difficulties appearing increases when the debt service-to-income ratio passes 30%[26]. The survey of 2017 for Estonia found this to be the case for around 5% of all households with loans. The share is substantially higher though among the lower income groups (see Figure A2.5).

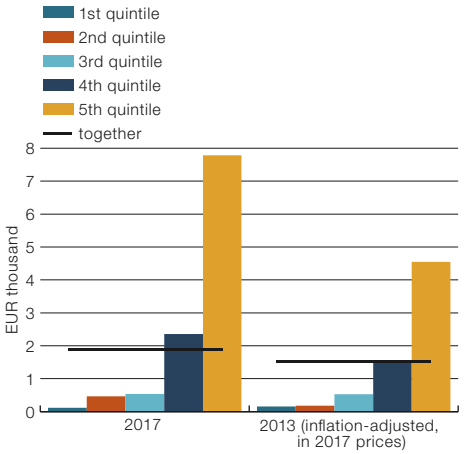
The debt burden is larger for households that have a housing loan. The median value of the loan-to-income ratio is also lower for this group than it was in 2013, though not in all income

25 The figures for Estonia are compared with the data for the euro area and the CEE countries taken from the second wave of the HFCS, which was carried out in 2013-2015, except in Spain where it was carried out in 2011-2012. The figures presented here are mostly based on data presented in the report *The Household Finance and Consumption Survey: results from the second wave* (ECB Statistics Paper Series 18/ Dec 2016) and the statistical tables of the HFCS (ECB-HFCS (Wave 2) Statistical Tables, April 2017).
The CEE countries covered here are Estonia, Hungary, Latvia, Poland, Slovakia and Slovenia. The indicators for the CEE countries are calculated as the arithmetic mean of the figures for individual countries, but the figures for Latvia for the first and second quintiles are omitted from the calculation because of a lack of data.

26 Generally this threshold value is derived from the ratio where the denominator is the net income. As the HFCS uses a ratio that has gross income as the denominator, lower threshold values can also be looked at.

quintiles. The share of those households that have a very high loan-to-value (LTV) ratio for their housing loan has also fallen a little. It is estimated that in 2017 a little over 30% of households with a housing loan had an LTV ratio above 60%[27].

Figure A2.6. Median value of financial assets of households with debt



Sources: Eesti Pank, HFCS

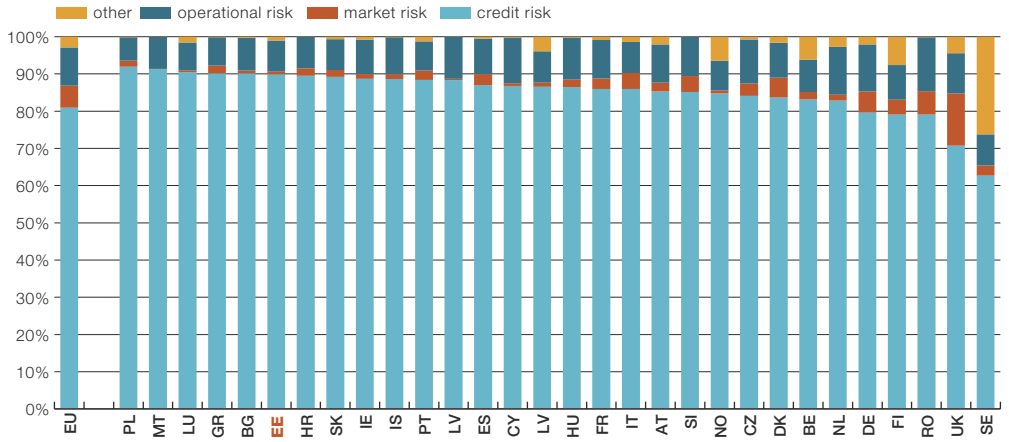
The exposure of households to risks from their debt burdens depends not only on the level of their debt burden but also on the financial buffers of the household. Although the indicators for the debt burden of Estonian households are below the average for the euro area, so are those for financial buffers, which are also very unevenly distributed (see Figure A2.6). The median value of the liquid financial assets of households in Estonia with loan liabilities is equal to less than one month of gross income. This suggests that although the ability of households to service their loans has improved, they are still very vulnerable if they lose income for even a short time, for example if they become unemployed.

27 If the LTV is 60%, the value of the real estate used as collateral needs to fall by more than 40% for it to have a smaller value than the outstanding loan. In the last economic crisis, housing prices in Estonia fell on average by 40-50%.

APPENDIX 3. THE ROLE OF THE CALCULATION METHOD FOR CREDIT RISK IN SETTING THE CAPITAL REQUIREMENTS FOR BANKS

Capital requirements are the minimum amount of capital that a bank must hold depending on the size and riskiness of its assets and activities. The majority of the own funds required of the banks operating in Estonia must currently be held against credit risk, as about 90% of the total risk weighted exposure comes from credit risk. As in most European countries, operational risk is quite substantial alongside credit risk (see Figure A3.1). The openness of the Estonian banking sector to market risk is lower than the average in the European Union. This means the amount of own funds required depends mostly on the size and structure of the credit portfolios of the banks, the methods used for risk assessment, and additional requirements set by micro and macroprudential authorities.

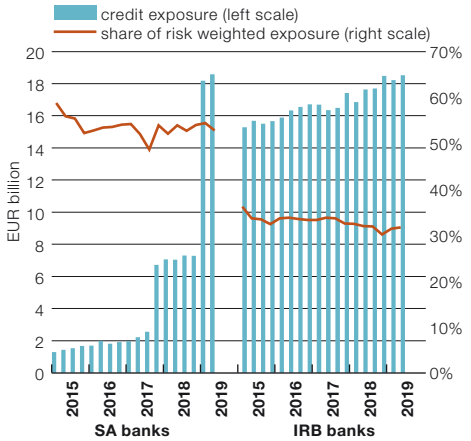
Figure A3.1. Structure of the total risk exposure of banks



Source: EBA Risk Dashboard 2019 Q1

Most of the banks operating in Estonia currently use the standardised approach (SA) for calculating their risk-weighted assets, but Swedbank and SEB are authorised to apply the internal ratings based (IRB) approach. The total unweighted volume of credit exposures of the banking sector was divided roughly equally between the SA banks and IRB banks as at the end of June 2019.

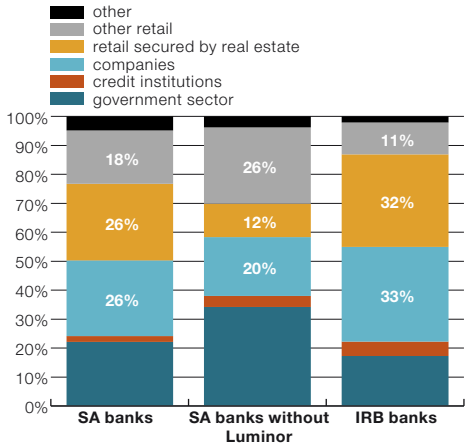
Figure A3.2. Credit risk exposure of banks



Sources: Finantsinspektsioon, Eesti Pank

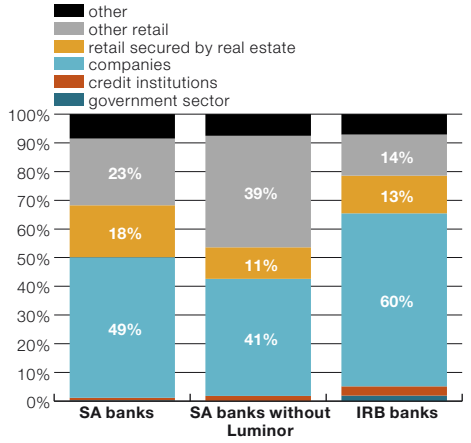
The risk weights for asset classes are set by regulation in the standardised approach and do not change over time. In the IRB approach, the risk weight is based on internal risk assessment models, where the share of loan losses in previous periods is the primary factor for estimating the size of credit risk. The differences in the methodologies result in the SA banks in Estonia calculating their amounts of own funds required from a larger share of their credit exposures than the IRB banks do, and so the average risk weight applied to their portfolio is higher at 55% than the 30% for the IRB banks (see Figure A3.2). The significant increase in the credit exposures of the banks using the standardised

Figure A3.3. Structure of the credit exposure of banks as at 30.06.2019



Sources: Finantsinspektsioon, Eesti Pank

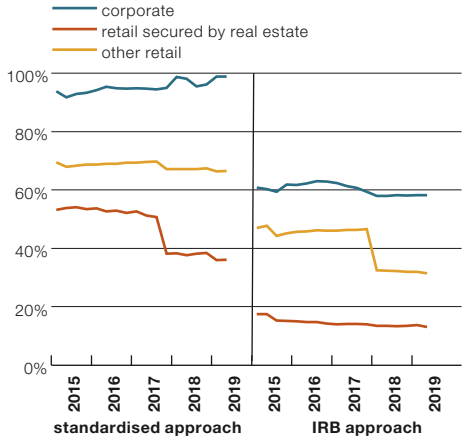
Figure A3.4. Structure of the risk weighted credit exposure of banks as at 30.06.2019



Sources: Finantsinspektsioon, Eesti Pank

approach in recent years is the result of the creation of Luminor Bank in 2017 and of that banking group merging its Latvian and Lithuanian subsidiaries under the Estonian head office as branches in 2019.

Figure A3.5. Average risk weights of credit exposures



Sources: Finantsinspektsioon, Eesti Pank

The capital needs of a bank depend to a large extent on how its loan portfolio is divided between different client sectors and loan types, as different loans have different risk levels. It is mainly smaller banks that use the standardised approach, and the structure of their credit exposures often differs from that of the IRB banks (see Figure A3.3). The loan portfolios of several SA banks are largely composed of riskier 'other retail exposures' or consumer loans and they generally have fewer mortgages and corporate loans in their portfolios. In aggregate the structure of the credit exposures of the SA banks was recently brought closer to that of the IRB banks with the creation of Luminor Bank, which uses the standardised approach but has a credit portfolio structure that resembles more closely those of the current IRB banks. Corporate loans and loans secured by real estate play a larger and quite equal role in the credit exposure of the IRB banks. The amounts of the risk exposures of the IRB banks depend though on the risk weights applied from the estimates of the banks' internal models. According to these estimates their risk exposure from the corporate loan portfolio is about 4.5 times higher than their risk exposure from the mortgage loan portfolio (see Figure A3.4).

The application of the internal ratings approaches has helped the IRB banks in Estonia to reduce their capital requirements substantially. The average risk weights on housing loans especially have fallen to quite low levels (see Figure A3.5). Given that this downwards trend may continue, Eesti Pank introduced a floor of 15% for the average risk weight of the portfolio of retail exposures secured by real estate for the IRB banks. The requirement came into force from 30 September 2019.

It is important that the risk assessments of the banks also take proper account of systemic risks, and that the banks hold sufficient own funds to be able to cope in an unfavourable economic climate. If risk weights fall too low, the resilience of the banks to possible loan losses in the future will be weakened, and if the risks are realised it will be harder for companies and households to access funding in the future and the cost of borrowing will rise. If the own funds of a bank are close to a critical level at a time when it is difficult to acquire additional capital, this could put pressure on the bank to reduce its risk exposures, which can be done by selling assets or by replacing assets of higher risk with less risky assets. This however could have a negative impact on the financing of the corporate sector.

APPENDIX 4. IMBALANCES IN MACRO INDICATORS THAT ARE RELATED TO LOAN QUALITY

Eesti Pank reviews the countercyclical buffer rate once a quarter. The buffer is intended to protect the banking sector against losses that could be caused by cyclical systemic risks building up in the economy. In setting the buffer rate, Eesti Pank looks at the credit-to-GDP gap and also to other macroeconomic indicators showing the position of the financial cycle in Estonia.[28]

Kukk and Levenko (2019[29]) have researched the relations between macroeconomic indicators and loan quality, and found which indicators should be considered when setting the countercyclical buffer. Their analysis shows that the macroeconomic indicators that affect loan quality most in Central and Eastern European countries are the output gap, unemployment, inflation, and changes in unit labour costs. How changes in unit labour costs affect loan quality has not earlier been researched. This appendix summarises the research.

Analysis method

The cyclical components of the macroeconomic indicators are separated out from the long-term trend[30] to allow assessment of which macro indicators affect the dynamics of overdue loans most when they are imbalanced. The local projection method (LPM) was used in the estimation:

$$\Delta_h NPL_{it+h} = \alpha_i + \sum_{l=1}^{L} \mathrm{P}_{h,l} NPL_{it-l} + \sum_{l=0}^{L} \Gamma_{h,l} X_{it-l} + u_{h,it}$$

The model estimated the dynamics of non-performing loans (NPL) over eight quarters (h = 1,…,8) after a change to the cyclical component of the macro indicator. The model uses non-performing loans and macro indicators with two lags (l = 1, 2). The analysis covers 24 European countries that are divided into three groups of Central and Eastern European (CEE) countries, Western European countries, and Southern European countries[31].

Main findings

Figure A4.1. shows the impulse response functions for the group of Central and Eastern European countries, which most accurately reflect the relation between non-performing loans and macro indicators in Estonia. The results should be compared with those of other groups, especially the Western European countries, with which the Estonian economy is converging.

If the economy shrinks, the share of non-performing loans increases in all three groups. If economic growth in Central and Eastern European countries remains one percentage point below its long-term trend, the rate of non-performing loans rises by up to 1.5 percentage points above its average, though the confidence bounds for this estimate are wide. The rise in unemployment increases the share of non-performing loans in Central and Eastern Europe and in Western European countries, with the rate of non-performing loans rising by one percentage point when unemployment increases by one percentage point. This is because households are less well protected against economic difficulties than those in Western European countries are.

28 *The countercyclical buffer. The principles and indicators for setting the buffer rate in Estonia.* October 2015.

29 Kukk, M., & Levenko, N. (2019). *Macroeconomic imbalances and loan quality in panels of European countries,* Working Papers of Eesti Pank, No. 2019/6.

30 The long-term or trend changes are extracted from the dynamics of macroeconomic indicators together with the volatility caused by the economic cycle. Values that are higher or lower than the long-term trend are the cyclical component, and they indicate imbalance. The cyclical component is identified using Hodrick-Prescott filtering. Quarterly figures are seasonally adjusted beforehand.

31 The Western European countries used are Austria, Belgium, Denmark, Finland, France, Germany, the Netherlands, Sweden and the United Kingdom; the Central and Eastern European countries are Croatia, Czechia, Estonia, Hungary, Latvia, Lithuania, Poland, Slovakia and Slovenia; and the Southern European countries are Cyprus, Italy, Malta, Portugal and Spain. Ireland was also treated as a member of the Southern European group.

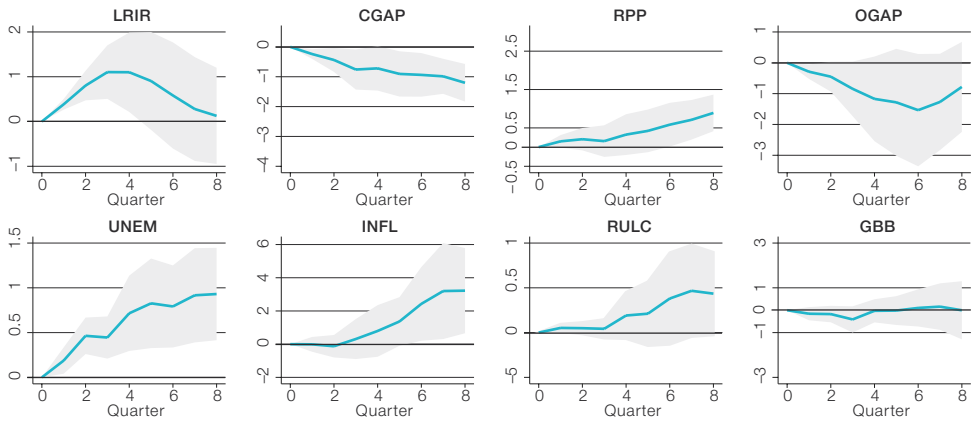
Excessive inflation also raises the rate of non-performing loans by more in the Central and Eastern European countries than it does in Western Europe. This shows that households and companies in the Central and Eastern European countries are more sensitive to price increases. Higher prices reduce the purchasing power of residents and make domestic prices higher for companies, making it harder for households and companies to service their loans.

No relation was found between the dynamics of non-performing loans and the indicators for the current account and the exchange rate, which illustrate external imbalance in the economy.

A new finding is the relation of non-performing loans with unit labour costs. If unit labour costs rise above their long-term trend, the share of non-performing loans rises in Central and Eastern Europe and in Western European countries. There is a particularly strong link in the Central and Eastern European countries between non-performing loans and changes in nominal unit labour costs. Real unit labour costs, which are adjusted for inflation, also seem to be related to rises in non-performing loans, though the wide confidence bounds mean this cannot be stated with certainty. It is probable that the positive relation with nominal and real unit labour costs arises from overdue corporate loans, as labour is an important production input and the labour cost for each unit of production defines the cost level and competitiveness of a company. Confirmation of this hypothesis would require the data for overdue corporate and private loans to be researched separately. Unit labour costs have not previously been linked to non-performing loans, but this analysis shows that it is important to consider them when estimating the dynamics of overdue loans.

In summary, the analysis of the macro indicators confirmed that analysis of loan quality should consider not only factors directly connected to loans but also imbalances in macro indicators. The macro indicators most often associated with the loan quality in the Central and Eastern European countries are the output gap, and imbalance in the unemployment and inflation figures, but changes in unit labour costs should also be monitored (see Figure A4.1[32]).

Figure A4.1. Impulse responses of overdue loans in Central and Eastern European countries*



* Impulse response function from Local Projection Method 90% confidence interval
Source: Kukk & Levenko 2019

32 LRIR – the long-term real interest rate; CGAP – the credit gap in % of GDP; RPP – the cyclical component of the real property prices index; OGAP – the output gap; UNEM – the unemployment rate; INFL – deviation of the inflation rate from the target of 2%; RULC – the cyclical component of real unit labour costs; GBB – the government budget balance in % of GDP.