Forecast

Alternative scenario: Higher interest rates are slowing inflation and economic growth in Finland

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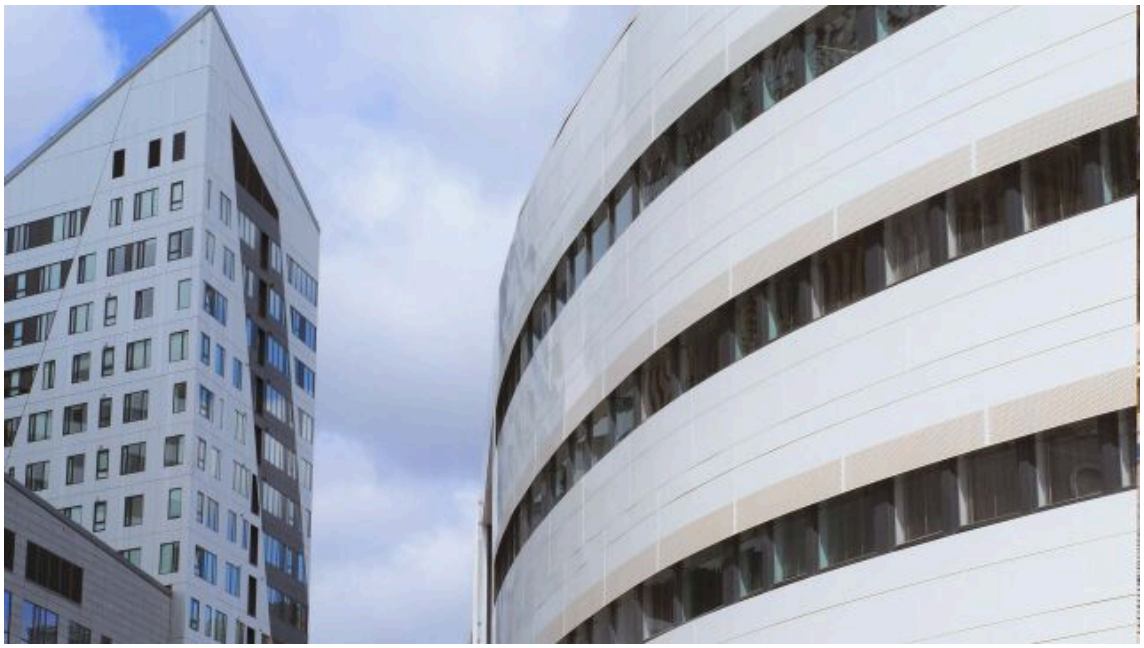


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The ECB has substantially tightened monetary policy in the euro area during the past two years, following the exceptional surge in inflation. The tightened monetary policy is being transmitted to the economy through many different channels, including rises in lending rates. Higher interest rates are dampening economic growth and slowing down inflation. In Finland, variable rate mortgages are common, which to some extent is amplifying the impacts of monetary policy on economic growth and inflation. However, another key factor regarding the strength of the impacts is the amount of financial margin households have that can be used as a buffer against the increase in loan servicing costs.



The European Central Bank (ECB) started to tighten its monetary policy in December 2021, when inflation in the euro area had clearly started to rise. In December 2021, the ECB announced that it would reduce asset purchases under the monetary policy purchase programmes, and in July 2022 it started to raise its key interest rates.

Monetary policy tightening affects the economy through many different channels.[1] The rise in policy rates and reduction in net asset purchases raises both short and long-term market interest rates, such as Euribor rates and government bond yields, throughout the euro area. Tighter monetary policy also strengthens the euro's exchange rate. Higher interest rates incentivise people to save, but this also reduces private consumption, investment and the demand for housing. At the same time, the strengthening of the euro weakens the price competitiveness of exports. Ultimately this reduces aggregate demand and slows inflation.

Increases in policy rates are transmitted to the economy mainly through interest rates on bank loans. Euribor rates are commonly used in Finland as reference rates for both housing and corporate loans. The rise in interest rates makes bank loans more expensive, reducing the demand for new loans. It also raises the loan servicing costs of households and companies. Unlike the euro area on average, the majority of mortgages in Finland are variable rate loans. Consequently, the rise in Euribor rates causes the loan servicing costs of Finnish mortgage borrowers to rise rapidly. This reduces consumption demand especially if households do not have enough financial flexibility to provide a buffer against rising interest rates.

With the help of macroeconomic models, this article assesses how much the monetary policy tightening carried out since December 2021 has affected the economic cycle in Finland. The

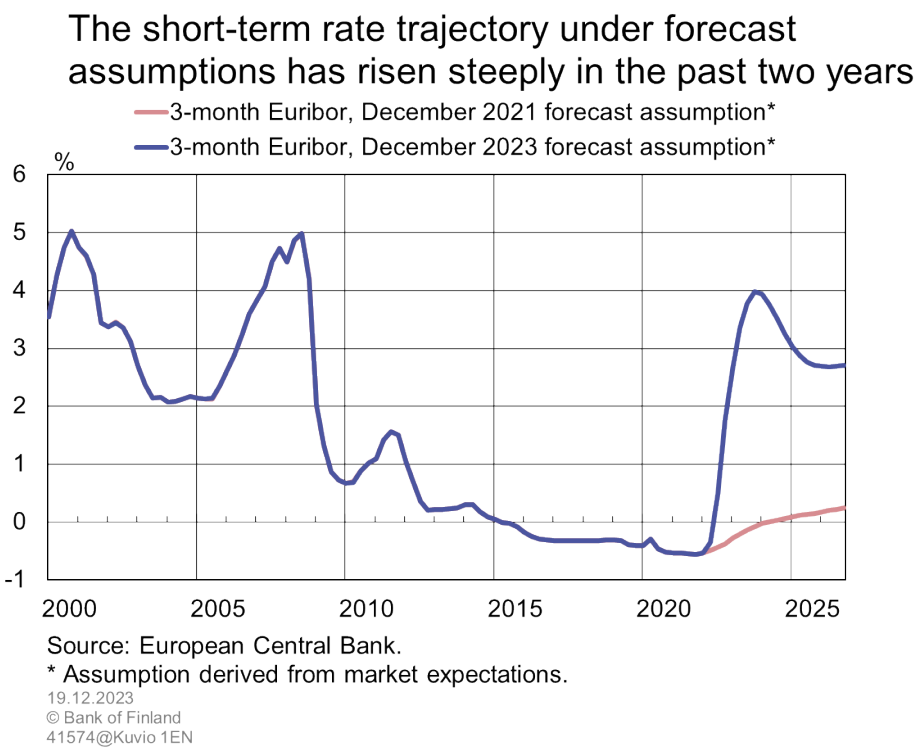
transmission of monetary policy through increases in Euribor and lending rates will be examined, in particular. The article also assesses the significance of the large proportion of variable rate mortgages in regard to how strongly the ECB's monetary policy is transmitted in Finland. Finally, we examine the importance of whether households, with the aid of their financial buffers, can adequately balance the impacts of growing loan servicing costs on their spending. The calculations were made using the Bank of Finland's Aino 2.0 and Aino 3.0 models.

According to the calculations, the increase in short-term market rates will dampen growth especially in 2023 and 2024, when rising interest rates will reduce annual GDP growth by just over 1 percentage point. The impact on inflation will appear after a time lag, and will peak in 2024, when inflation will fall due to higher interest rates by just under half a percentage point. If we also take account of the rise in long-term market interest rates and the strengthening of the euro, the slowing effect of monetary policy on growth and inflation is even greater. Important factors determining the strength of these effects are households' financial margin and their ability to provide a buffer against growth in loan servicing costs. The extent to which bank loans are variable rate loans also has some effect on the strength of monetary policy transmission.

Higher interest rates and a strengthening euro are clearly slowing economic growth and inflation

Between December 2021 and December 2023, the 3-month Euribor rate rose by 4.5 percentage points (Chart 1). Using the assumption employed in the Bank of Finland's forecast, which is based on market expectations, the 3-month Euribor will be an average of 3.5 percentage points higher in 2023 than in 2021 (Table 1). Long-term rates have also risen substantially. Such a substantial and fast increase in interest rates has not been seen before in the euro era.

Chart 1.



Below, the direct macroeconomic impacts of tighter monetary policy on the Finnish economy are assessed with the help of a calculation produced with the Aino 2.0 model. The calculation assumes that interest rates would have remained at a level which accords with the assumptions underlying the Bank of Finland's December 2021 forecast. A statistical model was also used to assess the impact of monetary policy tightening on exchange rates, and this impact was removed from the exchange rate assumptions underlying the December 2023 forecast. In the calculation, the external economic environment (export demand, raw material prices, etc.) is assumed to have developed in line with observations up to the third quarter of 2023, and to continue developing in the forecast period in accordance with the Bank of Finland's December 2023 forecast.

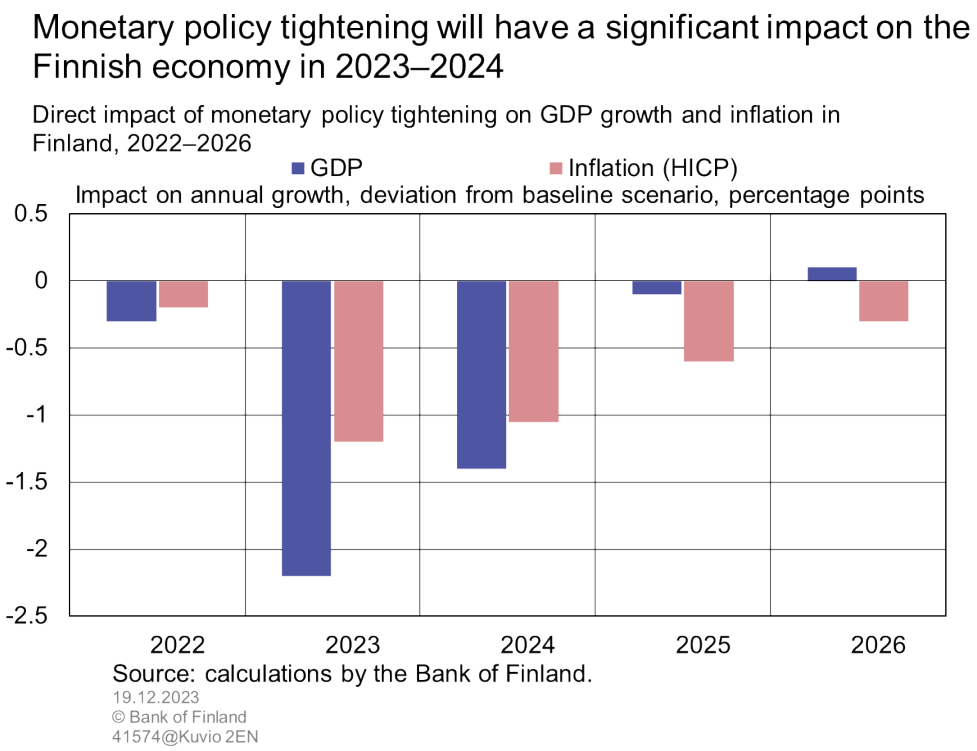
The alternative growth scenario generated with the model is compared with the actual performance in 2022 and with the Bank of Finland's December 2023 baseline forecast for 2023–2026. This enables an assessment of how the economy is affected by tighter monetary policy transmitted via rising interest rates and a strengthening euro as indicated in Table 1. However, the analysis does not take account of indirect impacts on Finland from the euro area that result from the impacts of monetary policy on other euro area economies, and thereby on Finland's export demand and export prices.

Impact of monetary policy tightening on interest rates and exchange rates as of 1 January 2022			
Difference in assumptions of Bank of Finland forecasts made in December 2021 and December 2023			
	3-month Euribor (difference in relation to Dec 2021 level, percentage points)	10-year interest rate (difference in relation to Dec 2021 level, percentage points)	Nominal effective exchange rate* (difference in relation to Dec 2021 level, %)
2022	0.8	0.5	1.9
2023	3.6	1.9	8.6
2024	3.6	2.6	9.6
2025	2.7	2.8	9.6
2026	2.5	3.0	9.6
*Increase causes exchange rate to strengthen, i.e. price competitiveness weakens.			

Sources: Bank of Finland and European Central Bank.

According to the model calculation, monetary policy tightening has substantial direct impacts on economic growth and inflation (Chart 2). The calculation looks at the growth and inflation impacts that accumulated during the past two years as well as the still ongoing impacts. Monetary policy is transmitted to the economy with a time lag, and the impacts will be at their greatest in 2023 and 2024. According to the calculation, the monetary policy tightening carried out since December 2021 has reduced GDP growth in Finland in 2023 by more than 2 percentage points. The slowing effect on inflation is just over 1 percentage point. The impacts diminish in 2024, when the current interest rate level will stabilise and interest rates will start to fall slightly, according to market expectations.

Chart 2.



The above calculation was produced with the Bank of Finland's Aino 2.0 model, which was also used for preparing the Bank of Finland's December 2023 baseline forecast. It broadly describes the direct effects of monetary policy tightening that are transmitted to the economy through short and long-term market rates and exchange rates. However, the Aino 2.0 model does not fully take account of the dynamics of the housing market, nor of the fact that some households have a mortgage and only a small financial margin with which to adjust to rising interest rates. These economic components are modelled more accurately in the Aino 3.0 model.

Rise in short-term interest rates affects private consumption and housing markets in particular

Below, with the aid of the Aino 3.0 model, further detail is given of the transmission of monetary policy to the Finnish economy through Euribor rates and bank lending rates, but excluding other monetary policy transmission channels and factors affecting the business cycle. Since most housing loans and corporate loans are tied to Euribor rates, this transmission channel plays a key role in Finland. As this model calculation has been prepared with a different model to the calculation presented above describing the broad direct impacts of monetary policy, the results of the calculations are not directly comparable with each other. However, the results of the calculations are along the same lines.

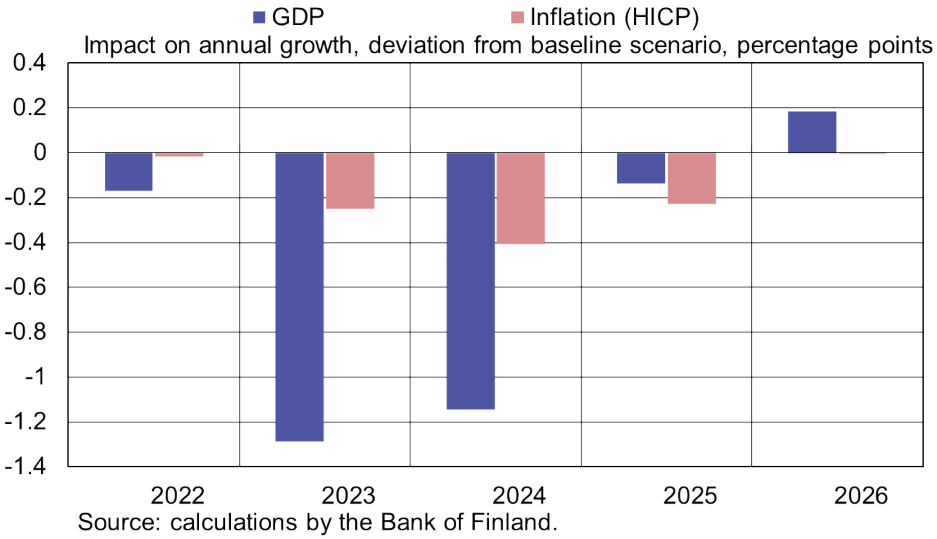
In the model calculation, the baseline of the December 2023 forecast is again compared to a situation in which the 3-month Euribor would have remained on a trajectory corresponding to the market expectations of December 2021 (Chart 1). However, long-term interest rates and exchange rates are assumed to have developed in line with observations. Therefore, only the accumulated impact of rising Euribor rates on the Finnish economy is assessed (Table 2, Calculation 1).

Even on its own, an increase in short-term market rates weakens economic growth and slows inflation substantially in Finland (Chart 3). The biggest impact of the interest rate increases falls in 2023 and 2024, when economic growth slows by slightly more than 1 percentage point compared to a situation in which the 3-month Euribor would not have increased at all from the level expected in December 2021. In 2026, the impact on economic growth turns positive, as the 3-month Euribor rate decreases in the coming years according to the market expectations used in the forecast (Chart 1). The results show that rising Euribor rates will bring down inflation especially in 2023–2025.

Chart 3.

Interest rate movements have a significant impact on the economy

Direct impact of rise in 3-month Euribor rate on GDP growth and inflation in Finland, 2022–2026



Source: calculations by the Bank of Finland.

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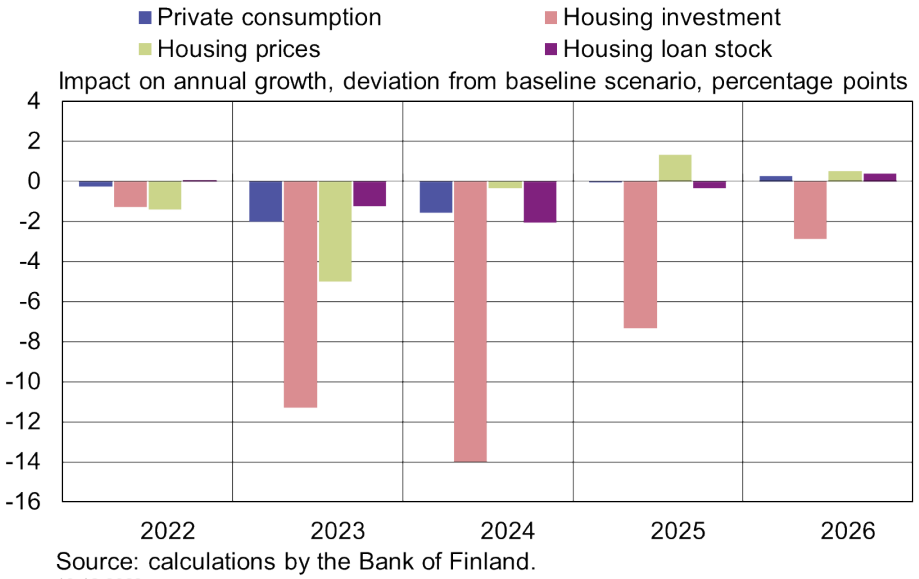
Higher Euribor rates curb inflation and economic growth through dampening aggregate demand and especially housing investment. Annual growth in housing investment will weaken by over 10 percentage points in 2023 and 2024 compared with a situation in which interest rates do not increase (Chart 4). Throughout history, housing construction has been an industry that is quite

sensitive to changes in market interest rates, and this is the case now as well. Higher interest rates are now also substantially impairing annual growth of private consumption in 2023 and 2024, as households' disposable income diminishes and the rise in real interest rates encourages households to save. Due to the reduction in credit demand, the stock of housing loans will also contract. The nominal prices of housing react quickly to rising interest rates, and the strongest impact is felt in 2023.

Chart 4.

Housing investment is sensitive to changes in interest rates

Impact of rise in 3-month Euribor rate on private consumption and the housing market in Finland, 2022–2026



Source: calculations by the Bank of Finland.

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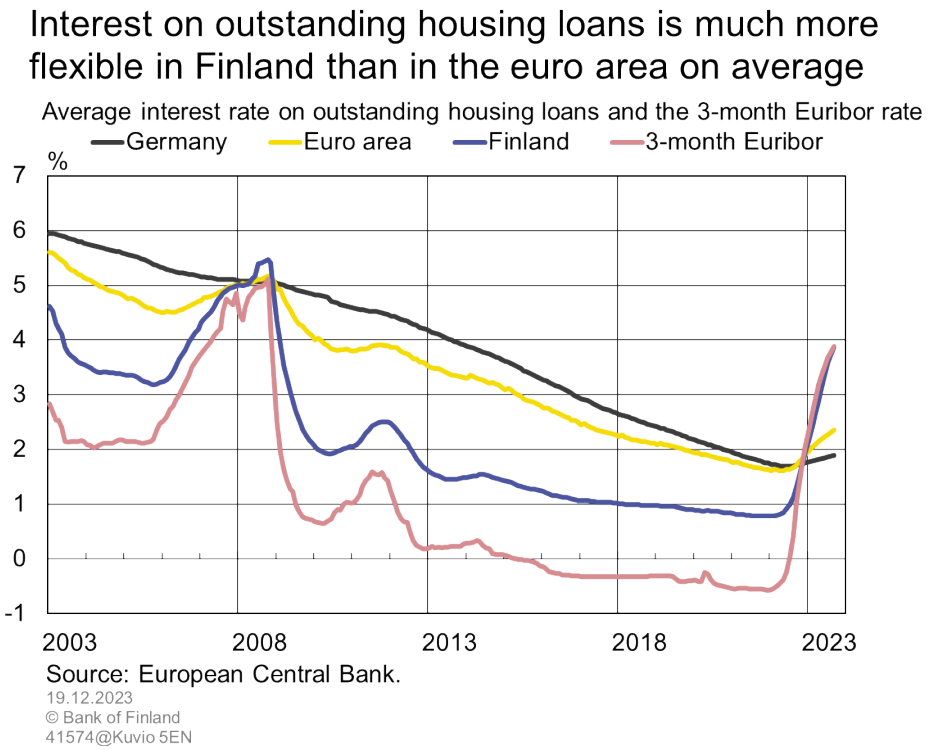
Fixed lending rates would slightly reduce the impact of Euribor rate rises

A large proportion of housing loans in Finland are variable rate loans, while in many euro area countries, such as Germany, fixed lending rates are common. This has a substantial impact on how the average interest rate on outstanding housing loans changes as monetary policy tightens and loosens. In Finland, the average interest rate on outstanding housing loans has changed rapidly in the wake of rising and falling ECB key interest rates and short-term market rates (Chart 5).

In the current cyclical phase, interest rates on existing mortgages have also risen significantly more slowly on average in the euro area than in Finland due to the large proportion of fixed rate loans in the euro area. Similarly, in the 2010s, the average interest rate on outstanding housing

loans did not decrease as quickly or to such a low level in the euro area as in Finland, and for a long time Finnish households enjoyed considerably lower mortgage rates than households in the euro area on average. In the long run, a shorter term interest rate is lower than a longer term interest rate, as there is no need to pay insurance on the predictability of interest rates.

Chart 5.



Below, with the help of the model calculation, an assessment is made of how the prevalence of variable rate mortgages affects monetary policy transmission and the strength of transmission. In the calculation, it is assumed that the average interest rate on Finland's outstanding housing loans would behave in the same manner as the average interest rate on the euro area's outstanding housing loans (Chart 5). In other words, it is assumed there would be an equivalent proportion of fixed rate housing loans in Finland as in the euro area on average (Table 2, Calculation 2). Otherwise, the calculation's underlying assumptions are the same as above in Calculation 1. Comparing the results of Calculations 1 and 2 enables an assessment of how much the prevalence of variable rate loans in Finland affects the strength of monetary policy transmission compared with the rest of the euro area.

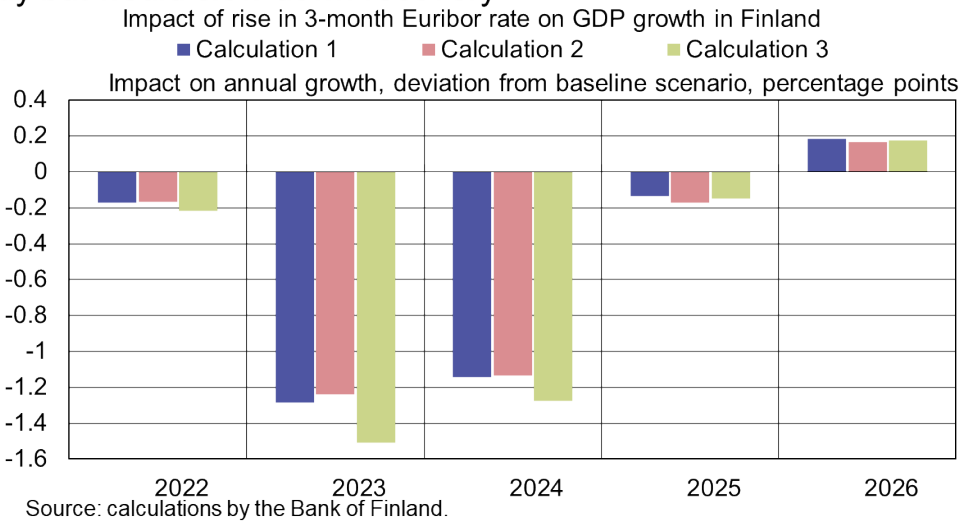
A substantially higher proportion of fixed rate loans would slightly alleviate the macroeconomic impacts of rising Euribor rates. If there were an equivalent proportion of fixed rate mortgages in Finland as in the euro area on average, the rise in Euribor rates would slow economic growth in 2023 by around 0.1 percentage points less than in the current situation (Chart 6), but inflation

would be very slightly higher than at present because the transmission of monetary policy in the Finnish economy would be weakened slightly. However, when market interest rates start to decline slightly from 2024 onwards, the average interest rate on outstanding housing loans would also react more slowly to the decline, which in turn would slightly hold back economic recovery.

If fixed rate housing loans were common in Finland, a rise in market rates would mean that the loan servicing costs of mortgage-holding households would, on average, increase less and more slowly than those based on adjustable rates. This would support household consumption (Chart 7). However, only around a third of all households in Finland have outstanding housing loans.[2] Consumption by those households that do not have housing loans is not directly affected by the prevalence of variable rate mortgages. Tightening of monetary policy would reduce consumption by these households, as in Calculation 1. Neither is there a direct impact on business investment. All in all, the calculations indicate that the prevalence of variable rate mortgages has only a fairly slight bearing on how strongly the ECB's monetary policy tightening has been transmitted to the Finnish economy over the past two years.

Chart 6.

A larger proportion of fixed rate loans would alleviate the recession slightly but would slow down recovery

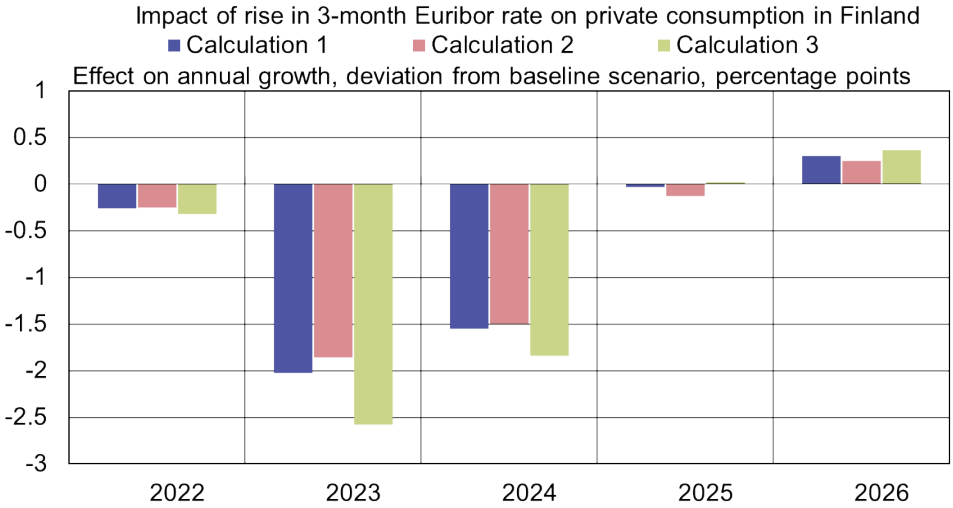


Source: calculations by the Bank of Finland.

Calculation 1: direct impact of rise in 3-month Euribor on Finnish economy since December 2021.
Calculation 2: Calculation 1 + proportion of fixed rate mortgages rises to euro area average
Calculation 3: Calculation 1 + proportion of credit-constrained mortgage borrowers rises by 10 percentage point
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Chart 7.

Increase in the number of credit-constrained households amplifies the transmission of monetary policy to private consumption



Source: calculations by the Bank of Finland.
Calculation 1: direct impact of rise in 3-month Euribor on Finnish economy since December 2021.
Calculation 2: Calculation 1 + proportion of fixed rate mortgages rises to euro area average
Calculation 3: Calculation 1 + proportion of credit-constrained mortgage borrowers rises by 10 percentage point
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When it comes to the economic impacts of monetary policy, the significance of variable rate loans is diminished by the fact that a large proportion of Finnish indebted households have savings and therefore the chance to provide a buffer against the immediate effects of rising interest payments on their own finances, at least for some time.

However, the calculation does not fully take account of the fact that variable rate loans increase uncertainty for households regarding their future interest expenditure. When rates rise, households may be more wary, and precautionary savings may increase. This could further fuel the reduction in private consumption as a whole, when there are large numbers of variable rate loans. Uncertainty over future interest rates may have increased more than usual, since rates have risen exceptionally quickly. On the other hand, when fixed rate loans are common, a larger proportion of households' income is used to service loans in the long term, on average, as fixed rate loans are generally more expensive than variable rate loans.

An increase in households' credit constraints would strengthen monetary policy transmission

When interest rates rise rapidly, an increasing number of households use a greater share of their income on debt servicing. At the same time, mortgage-holding households' ability to provide a

buffer against rising debt servicing costs could be reduced, and a growing number of households could be subject to binding credit or liquidity constraints.[3] This has probably been the case in Finland in the past two years.

Credit-constrained households do not have savings and are unable to take out a loan to smooth their consumption over time, so they may be forced to directly reduce other spending when interest rates rise. Monetary policy transmitted through variable rate loans will then have a stronger impact on private consumption and economic growth. The rapid rise in Euribor rates affects mortgage borrowers, in particular. In this section, we will examine the extent to which an increase in the number of credit-constrained mortgage borrowers amplifies the impacts of monetary policy tightening.

Approximately 20% of Finnish households are estimated to be credit-constrained.[4] In the model calculation, 12% of households have credit constraints. This is the proportion of credit-constrained owner-occupiers.[5] This calculation examines a situation in which the proportion of credit constrained mortgage borrowers rises by 10 percentage points, i.e. to 22% (Table 2, Calculation 3). The results are compared with Calculation 1. This allows us to estimate the extent by which the reduction in the financial margin of mortgage borrowers amplifies the macroeconomic impacts of a rise in Euribor rates when mortgages are most commonly variable rate loans.

The increase in the number of credit-constrained mortgage borrowers will strengthen the macroeconomic impacts of higher interest rates especially in 2023–2024 (Chart 6). Private consumption will weaken substantially as credit-constrained mortgage borrowers will have to cut back on other consumption as interest expenditure increases (Chart 7). Residential investment will also decline by a greater amount, as the demand for housing will decrease more if the number of credit-constrained households increases. However, the impacts are again rather moderate, as the narrowing of the financial margin affects a fairly small proportion of all households.

Results of calculations using the Aino 3.0 model			
	2022	**2023**	**2024**
Calculation 1: impact of rise in Euribor rates on the Finnish economy since December 2021			
Impact on annual growth, deviation from baseline, percentage points			
GDP	-0.2	-1.3	-1.1

Source: Bank of Finland.

Results of calculations using the Aino 3.0 model			
HICP inflation	0.0	-0.2	-0.4
Private consumption	-0.3	-2.0	-1.5
Housing investment	-1.3	-11.3	-14.0
Housing prices	-1.4	-5.0	-0.3
Housing loan stock	0.1	-1.2	-2.0
Number of hours worked	-0.2	-1.2	-0.9
Calculation 2: proportion of fixed rate mortgages rises to euro area average, impact on strength of monetary polic			
Impact on annual growth, deviation from baseline, percentage points			
GDP	-0.2	-1.2	-1.1
Private consumption	-0.3	-1.9	-1.5
Housing investment	-1.3	-11.2	-14.0
Calculation 3: proportion of credit-constrained mortgage borrowers rises by 10 percentage points, impact on stre			
Impact on annual growth, deviation from baseline, percentage points			
GDP	-0.2	-1.5	-1.3
Private consumption	-0.3	-2.6	-1.8
Housing investment	-1.4	-11.6	-14.1

Source: Bank of Finland.

In conclusion

The strong and rapid tightening of monetary policy since December 2021 has clearly slowed inflation and economic growth in Finland. The purpose of the tightening has been to reduce inflation, which had reached an excessively high level in the euro area, by dampening aggregate demand. Although tighter monetary policy weakens economic growth, protracted high inflation could cause even more significant welfare losses for an economy.

In Finland, changes in short-term market rates, such as Euribor rates, play a key role. Since both corporate and housing loans are usually variable rate loans in Finland, rising Euribor rates will raise the debt servicing costs of mortgage borrowers more quickly in Finland than in the euro area on average.

The extent to which mortgages are variable rate loans affects the transmission of monetary policy to some degree. However, the prevalence of variable rate housing loans does not in itself account for a significant proportion of the growth-hampering impact of monetary policy in Finland, despite the rise interest rates having been exceptionally rapid and substantial.

Nevertheless, the rapid increase in loan servicing costs has probably tightened the financial situations of households and increased the number of credit-constrained mortgage borrowers. This amplifies the transmission of monetary policy. However, Finnish households have thus far coped with the interest rate shock fairly well overall, as the employment rate and earnings growth have remained good, and many people have also been able to use their savings to smooth out their consumption.

In addition to the prevalence of variable rate loans, the Finnish economy is more sensitive to changes in interest rates than the average euro area country in other ways as well. Industrial production, especially heavy industry, and construction produce a higher-than-average proportion of the value added in Finland's economy, and these industries are quite sensitive to interest rate movements. Similarly, the proportion of value added accounted for by services is lower in Finland than the euro area average. The structure of the labour market and wage formation, for example, could also play an important role in how easily the national economy adjusts to external shocks. Economic growth is also affected by numerous factors other than monetary policy, such as changes in productivity and global developments in exports and prices.

Notes

1. More detailed information on the transmission of monetary policy is available on the ECB's website. ↑
2. According to Statistics Finland's indebtedness statistics, 30% of Finnish households had outstanding housing debt in 2022. ↑
3. A binding credit constraint refers to a situation in which a household does not have sufficient savings, and is unable to obtain the required or desired amount of loan, to finance a housing acquisition or its consumption needs. A liquidity constraint, in turn, refers a situation in which a household has only a small amount of liquid assets (for example cash or bank deposits) that could be used to provide a buffer against unexpected expenditure increases or income losses. In such situations, the household may be forced to reduce its consumption substantially. ↑

4. See Kärkkäinen, S. and Silvo, A. (2023) 'Household debt, liquidity constraints and the interest rate elasticity of private consumption', Bank of Finland Economics Review 2/2023. ↑
5. Both proportions of credit-constrained households were estimated using the household-level data from Statistics Finland's 2019 Household Wealth Survey, which also forms part of the ECB's Finance and Consumption Survey. In the Aino 3.0 model, it is assumed that a fixed proportion of households is always credit constrained, and the remaining portion is never subject to binding credit constraints. ↑

Keywords

Aino model, alternative scenario, GDP, general equilibrium model, inflation