ESRB
European Systemic Risk Board
European System of Financial Supervision

Macro-financial scenario for the 2023 EU-wide banking sector stress test

This document presents the baseline and adverse macro-financial scenarios that banks are required to use in the 2023 EU-wide stress-testing exercise coordinated by the European Banking Authority (EBA). In accordance with its mandate, the EBA, in cooperation with the European Systemic Risk Board (ESRB), initiates and coordinates EU-wide stress tests. The aim of such tests is to assess the resilience of financial institutions to adverse financial and economic developments, as well as to contribute to the overall assessment of systemic risk in the EU financial system.

The adverse scenario sets out paths for key economic and financial variables in a hypothetical adverse situation triggered by the materialisation of risks to which the EU banking system is exposed. The stress test is a scenario-based analysis measuring how the banking sector would fare under hypothetical adverse economic developments. Accordingly, the scenario should not be considered a forecast of the most likely negative shocks to the financial system.

Scenario variables include developments in real GDP, inflation, unemployment rates, real estate prices, stock prices, exchange rates, interest rates and real gross value added for selected economic sectors. The scenario covers the three years from 2023 to 2025 in line with the EBA methodology.[1] The baseline macro-financial scenario for EU countries is based on the December 2022 projections from the EU national central banks.[2] The adverse macro-financial scenario was designed by the ESRB's Task Force on Stress Testing in close collaboration with the European Central Bank (ECB).[3] The scenario was approved by the ESRB General Board and sent to the EBA on 23 January 2023.

1. Main risks to the stability of the EU financial sector and calibration of the adverse scenario

The narrative of the adverse scenario for the 2023 EU-wide banking stress test draws upon a subset of the main financial stability risks to which the EU banking sector is exposed, as identified by the ESRB

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[1]   Published at the **European Banking Authority**'s website.

[2]   For non-EU countries, the baseline macro-financial scenario is based mainly on the projections from the October 2022 International Monetary Fund (IMF) World Economic Outlook and data from the Organisation for Economic Co-operation and Development (OECD).

[3]   The scenario design methodology follows the calibration approach of the EBA 2020 scenario. Further details can be found in Annex 3 to "**Macro-financial scenario for the 2020 EU-wide banking sector stress test**", ESRB, January 2020.

General Board.[4] In the fourth quarter of 2022 the ESRB General Board[5] observed that risks to financial stability had increased as a result of persistently high inflation, a tightening of financial conditions and a perceptible deterioration in the economic outlook. The General Board stated that "[…] a prolonged period of low growth and elevated inflation, driven in part by surging energy prices, could give rise to renewed balance sheet stress in the non-financial corporate and household sectors and an upward shift in the number of insolvencies. This could be compounded by a turn in the housing cycle in a number of countries amid declining debt servicing capacity among households". In addition, the General Board noted that additional asset price corrections could be triggered by a further deterioration in the macroeconomic outlook, uncertainty about the path of monetary policy amid prolonged elevated inflation or an escalation of geopolitical tensions. Finally, the General Board emphasised that vulnerabilities in the real estate sector remained high in the light of a decline in households' disposable income, an increase in lending rates and a broad-based tightening of financing conditions coupled with heightened economic uncertainty.

The narrative also reflects recent risk assessments by the EBA and the ECB (Annex 2).

The convention used in the calibration of adverse scenarios for EBA stress tests is one of "no policy change", which also applies to the 2023 adverse scenario. This means that monetary policy and fiscal policy reactions other than those considered under the baseline scenario are not assumed under the adverse scenario. At the same time, risk-free rates and risk premia in the adverse scenario are consistent with adjusted market expectations about monetary and fiscal policies. Nonetheless, the fact that numbers reported in the adverse scenario do not provide information about potential policy decisions also applies to risk-free rates.

2. Aggravation of geopolitical tensions leading to stagflation

The Russian invasion of Ukraine has led to a severe geopolitical polarisation that will initiate a process of partial deglobalisation of the world economy. Deepening geopolitical fragmentation triggers a retrenchment of globalisation and disrupts established global production chains. In turn, this process exacerbates existing bottlenecks, thereby putting downward pressure on global economic growth through large adverse trade and price shocks.

This polarisation affects commodity prices, leading to increased production costs across the board. Geopolitical tensions and disruptions to logistics routes, compounded by speculation and supply shortages and cuts, generate soaring commodity prices, notably for energy and food. The rise in energy prices also has ripple effects on other commodity markets, with for instance higher costs for fertilisers further amplifying the upward

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[4] This subset does not include other risks identified by the General Board that may stem from climate change, system-wide cyber incidents or disruptions to critical financial infrastructures, including central counterparties.

[5] See **Press release of the ESRB General Board meeting of 1 December 2022**.

shock to agricultural commodity prices. This results in increased production costs for manufacturing and other sectors that rely more heavily on energy, food and other raw materials.

In parallel, a new outbreak of the coronavirus (COVID-19) destabilises supply chains worldwide. At the global level, the renewed rise in COVID-19 cases, amplified by the relaxation of containment measures in regions with low vaccination levels and low vaccine effectiveness, leads to further supply chain disruptions. This affects both production and logistics globally, which ultimately amplifies the inflationary pressures stemming from commodity prices. These pressures weigh particularly on COVID-19-hit sectors, as well as on other sectors that are particularly affected by commodity price hikes and supply constraints.

The resulting high inflation severely impairs private consumption and investment, both domestically and globally. Supply-driven higher production costs are partly passed on to consumer prices. The resulting soaring inflation depresses households' real income, promptly curtailing private consumption. In addition, firms revise their investment plans downwards due to lower demand prospects and profitability. This also leads to higher unemployment, further amplifying the decline in household consumption. In a very uncertain environment, the drop in domestic demand is additionally exacerbated by negative confidence effects on both households and corporates.

Strong and repeated inflationary pressures elevate inflation expectations and wage claims, triggering, through second-round effects, persistently high inflation across the EU. Faced with real income losses, workers and labour unions demand higher wages. This generates additional cost-push shocks, which firms partly pass on to consumer prices. This wage-price spiral ultimately leads to higher and longer-lasting inflation, with sustained adverse effects on private consumption, investment and in particular unemployment rates. Eventually, high and protracted inflation coexists with low or even negative growth.

The extent of the inflation increase differs across EU countries. Economies with a higher dependence on fossil fuels, a swifter or stronger pass-through to import prices or more flexible price and wage adjustments will respond more promptly to the external inflationary shocks. Indeed, the magnitude of second-round effects on inflation differs across countries and depends in particular on the institutional framework underlying the national wage formation process. Key factors include the prevalence of indexation clauses in collective bargaining and/or in the setting of minimum wages as well as the exclusion of energy prices from the inflation rate relevant for wage negotiations.

The increase in current and expected inflation, by triggering expectations of further policy reactions, leads to higher market interest rates – with adverse financial and real consequences. The implied severe tightening in financial conditions generates a spike in volatility and an abrupt adjustment in financial asset prices. These downward adjustments have severe negative wealth and confidence effects, further exacerbating the downward trend in private consumption and investment.

Emerging economies are subject to sudden stops in capital flows. While the above inflationary shocks are broad-based across all countries, induced higher risk-free rates also generate a sudden stop in capital inflows in emerging economies, albeit with some differences across countries (e.g. for commodity exporters), triggering a

sharp decrease in their output and exacerbating the impact of lower global production and trade. In the EU, these sudden and dramatic adjustments across emerging countries trigger lower foreign demand and an appreciation of the euro against domestic currencies of emerging countries.

The weaker economic outlook and tighter financial conditions also trigger a sizeable downward adjustment in real estate prices. Commercial real estate (CRE) is hit particularly hard, having already been especially vulnerable following the COVID-19 pandemic. At the same time, the persistent increase in interest rates and the reduction in households' income contribute to the downward revaluation of real estate prices, especially in economies characterised by higher imbalances and overvaluation and emerging markets subject to abrupt reductions in capital inflows.

The considerable increase in government debt around the world combined with higher market interest rate expectations lead to concerns about sovereign debt sustainability. Government debt has increased substantially as a result of public support measures put in place during the COVID-19 pandemic and more recently due to defence-related spending. A further weakening of economic growth amplifies concerns about public debt levels and intensifies pressures on sovereign yields. Differing macroeconomic and fiscal positions across EU countries lead to some heterogeneity in the response of sovereign bond yields to the assumed shocks.[6]
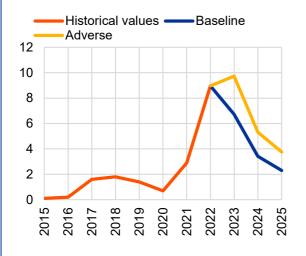
Likewise, higher private sector borrowing resulting from the COVID-19 pandemic, tighter financial conditions and the fall in corporate sector profitability lead to downward revisions in the private sector's creditworthiness and a reappraisal of credit risk premia. Financial conditions for the real economy deteriorate, also reflecting the increase in sovereign yields and its implications for bank funding costs. Sectors more heavily reliant on energy or agricultural commodities, or facing higher ratios of indebtedness, bear the bulk of the impact. Higher market rate expectations put an additional strain on households' and firms' balance sheets. Higher credit spreads further weaken investment and growth.

Overall, in the adverse scenario, high commodity prices, supply constraints and second-round effects keep inflation persistently high despite downward pressures on economic activity. Geopolitical tensions increase commodity prices, which – compounded by supply chain disruptions – push prices up. Second-round effects in the labour market reinforce and perpetuate these inflationary shocks. Under the adverse scenario, inflation increases to 9.7% in 2023 from 9.0% in 2022 (Chart 1). Towards the end of the horizon, weak business and consumer confidence, together with other adverse demand shocks, exert downward pressure on inflation, although the latter remains high compared with historical levels (5.3% in 2024 and 3.8% in 2025; Chart 1). As a consequence, short-term market rates markedly increase. For instance, the one-year euro swap rate increases from 1.1% in 2022 to 5.2% in 2023, declining slowly over the rest of the horizon to 4.3% in 2025 (Chart 2). In addition, the slope of the term structure of market rates under the adverse scenario is inverted. This feature is in

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[6] The calibration takes into account that the availability of the Transmission Protection Instrument (TPI) is expected to reduce the volatility of sovereign bond spreads, regardless of whether it is activated or not. The announcement of the TPI per se reduces the probability of self-fulfilling crisis episodes in sovereign debt markets.

line with current market data (e.g. the starting points) and consistent with inflation expectations remaining well anchored in the medium to long run.

Chart 1

Path of HICP inflation under the baseline and adverse scenarios
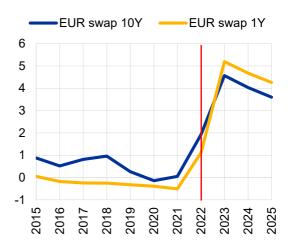
(percentages)

Sources: Eurostat, ECB and ECB/ESRB calculations.
Notes: HICP stands for Harmonised Index of Consumer Prices.
The value for 2022 is the inflation observed so far for the year.
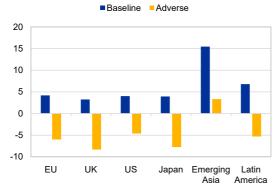
Chart 2

1Y and 10Y EUR swap rates under the adverse scenario

(percentages)

Sources: ECB and ECB/ESRB calculations.

Over the three years, the adverse scenario results in a severe contraction of real GDP in the EU – reflecting the external slowdown along with domestic real and financial shocks. The combination of persistently high commodity prices, tightened global financial conditions and high uncertainty constitutes a strong downward drag on the world economy, which weighs heavily on foreign demand in EU countries. This, coupled with tighter domestic financial conditions and low consumer and business confidence, leads to a decline in EU GDP of 6.0% between 2022 and 2025 (Chart 3).[7] For both 2023 and 2024, the EU experiences a strong recession (Chart 4). In the rest of the world, real GDP also contracts cumulatively by 4.6% in the United States, 8.3% in the United Kingdom, 7.7% in Japan and 5.3% in Latin America. In emerging Asia, GDP continues to grow over the horizon but at lower rates than under the baseline scenario (Chart 3).
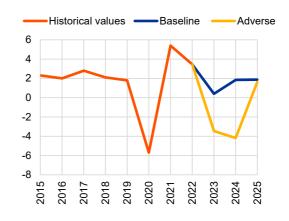
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[7]   In 2025 the deviation from the baseline level stands at -9.8%.

Chart 3

Three-year cumulative real GDP growth by region
(percentages)

Sources: ECB and ECB/ESRB calculations.

Chart 4

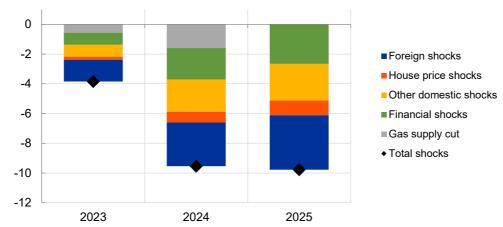Path of real GDP growth in the EU
(percentages)

Sources: Eurostat, ECB and ECB/ESRB calculations.

3. Scenario analysis

The decline in EU real GDP under the adverse scenario relative to the baseline is mainly driven by domestic shocks, in particular the financial ones. In terms of cumulative growth from the starting point over the horizon, the adverse scenario entails a large deviation of -9.8% in EU GDP compared with the baseline. This is mainly driven by domestic financial shocks that result chiefly from financial tightening and asset price corrections. These financial shocks explain more than a quarter of the total decline over the simulation horizon. Other domestic shocks, comprising confidence and uncertainty shocks as well as wage claim shocks, contribute by a similar amount to the negative decline in GDP. Foreign factors are an additional shock (37% of the total impact) driving the strong decline in external trade and hence in EU GDP. Gas shortages stemming from a full cut in Russian gas supply combined with an unsuccessful limitation in gas demand, few substitution possibilities from other suppliers and unusually cold winters also contribute to the decline in domestic activity, in particular in 2024 (Chart 5).

Chart 5

Shock decomposition of the adverse EU real GDP deviation from the baseline
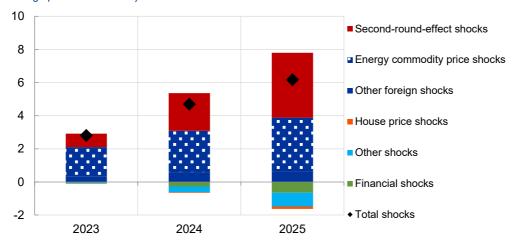
(percentage point contributions)

Sources: ECB and ECB/ESRB calculations.
Note: "Other domestic shocks" comprise confidence and uncertainty shocks as well as wage claim shocks.

A key feature of the adverse scenario is persistently high inflation, largely driven by energy price shocks and second-round effects but partially offset by the foreign and domestic demand drag. Inflation is mainly induced by shocks to energy commodity prices and wage claims (hereinafter second-round effects). Higher energy prices primarily result from oil and gas price shocks caused by the Russian invasion of Ukraine, accounting for 53% of the impact on the Harmonised Index of Consumer Prices (HICP) level relative to the baseline. The second-round effects explain around 60% of the increase in the HICP level over the horizon of the adverse scenario. Foreign shocks and, in particular, the increase in competitors' prices push domestic prices up. This is partially compensated by the disinflationary effects from adverse foreign demand, which limit the contribution of these foreign factors to 10% of the upward impact on the HICP. Similarly, domestic demand factors, such as confidence and financial shocks, put a drag on increasing domestic prices, partially offsetting the impact on the HICP level under the adverse scenario relative to the baseline by around 24% in 2025.

Chart 6

Shock decomposition of the adverse EU HICP deviation from the baseline

(percentage point contributions)

Sources: ECB and ECB/ESRB calculations.
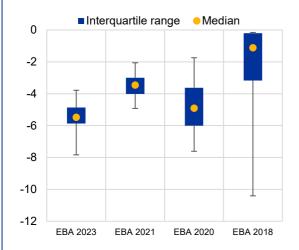*Note: "Other shocks" comprise confidence and uncertainty shocks as well as gas supply cut shocks.*

The EBA 2023 scenario entails a larger decline from the starting point in EU GDP than in the EBA 2021 scenario but a smaller deviation from the baseline. The severity of this scenario (measured in terms of cumulative growth in 2025 compared with 2022) has broadly increased in relation to previous EBA exercises, with median cumulative growth amounting to -5.5% (2.0 percentage points lower than the cumulative median in the EBA 2021 scenario; Chart 7). The maximum cumulative decline in the GDP level among EU countries is -7.8%, which is higher than in the EBA 2021 and EBA 2020 scenarios (-4.9% and -7.6% respectively) but lower than in the EBA 2018 scenario (Chart 7).

The cross-country dispersion of real cumulative GDP growth is lower than in previous EBA scenarios. The interquartile range in the adverse scenario is between -5.9% and -4.9%, while it was between -4.0% and -3.0% and between -3.2% and -0.2% in the EBA 2021 and EBA 2018 scenarios respectively. Considering an alternative severity metric (i.e. the maximum yearly decline of real GDP in the adverse scenario compared with the maximum historical declines), the median ratio is slightly above 1, meaning that the maximum decline in the adverse scenario is aligned with historical declines of real GDP, while the ratio was closer to 0.5 in the EBA 2021 scenario.
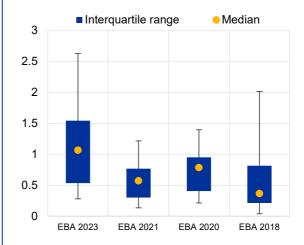
Chart 7

Cross-country dispersion of cumulative GDP growth under the adverse scenario

(percentages)

Sources: ECB and ECB/ESRB calculations.
Note: The interquartile range is defined as the difference between the 75th and 25th percentiles of the distribution.

Chart 8

Cross-country dispersion of maximum yearly decline in real GDP relative to maximum historical decline

Sources: ECB and ECB/ESRB calculations.
Note: The interquartile range is defined as the difference between the 75th and 25th percentiles of the distribution.

The increase in the unemployment rate in the adverse scenario is on average higher than in previous EBA scenarios. The scenario assumes a relatively strong increase in the unemployment rate (measured in terms of the cumulative increase between 2022 and 2025). The median increase in the unemployment rate across EU countries is 5.7 percentage points, which is higher than the cumulative increase in the EBA 2021, EBA 2020 and EBA 2018 scenarios (4.8 percentage points, 3.3 percentage points and 1.6 percentage points respectively; Chart 9).

In addition, the cross-country dispersion for unemployment increases is lower compared with previous EBA scenarios. The interquartile range under the adverse scenario is 5.0 to 6.2 percentage points against a range of 4.1 to 5.7 percentage points under the EBA 2021 scenario, 2.9 to 4.5 percentage points under the EBA 2020 scenario and 1.0 to 3.1 percentage points under the EBA 2018 scenario. In terms of maximum deviations from the baseline, the median deviation across EU countries is higher than under previous EBA scenarios and the country dispersion of these deviations is smaller than under previous scenarios (Chart 10).
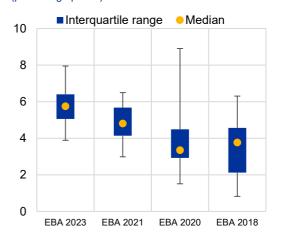
Chart 9

Cross-country dispersion of the cumulative increase in the unemployment rate in 2025

(percentage points)

Sources: ECB and ECB/ESRB calculations.
Note: The interquartile range is defined as the difference between the 75th and 25th percentiles of the distribution.
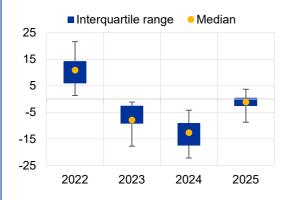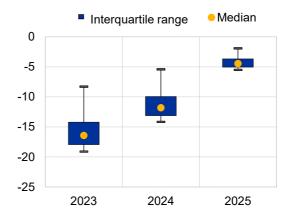
Chart 10

Cross-country dispersion of the maximum deviation from the baseline level in the unemployment rate under the adverse scenario

(percentage points)

Sources: ECB and ECB/ESRB calculations.
Note: The interquartile range is defined as the difference between the 75th and 25th percentiles of the distribution.

Compared with previous EBA scenarios, the correction in real estate prices affects CRE more severely than residential real estate (RRE). Persistently high inflation and the looming recession, coupled with a severe tightening of financial conditions, have a considerable impact on the outlook for the CRE market, which remains affected by the previous COVID-19 pandemic, compared with the RRE market. The median decrease in CRE prices is driven by a strong correction of -16.4% in 2023 and a gradually slower fall in the following years: -11.8% in 2024 and -4.5% in 2025. Conversely, the median decrease in RRE prices is -7.9% in 2023, with the largest decline of -12.7% occurring in 2024. In 2025, the median decline in RRE prices is only marginal at -1.2% (Chart 11). Although heterogeneity is contained, it remains slightly higher for RRE prices than in previous EBA scenarios. This is mainly explained by the greater heterogeneity in house price imbalances across EU countries in 2022 compared with the level of imbalances in 2020.

Chart 11

Cross-country dispersion of annual changes in RRE and CRE prices
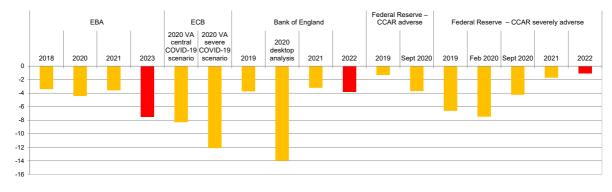
(percentages)

Sources: ECB and ECB/ESRB calculations.
Note: The interquartile range is defined as the difference between the 75th and 25th percentiles of the distribution.

The scenario is more severe than the 2022 scenarios of the Bank of England and the Federal Reserve System, which in part reflects the use of updated data. Compared with stress test scenarios released by the Bank of England and the Federal Reserve in 2022, the scenario assumes a significantly sharper maximum decline in domestic real GDP from the starting point than the Federal Reserve's 2022 Comprehensive Capital Analysis and Review (CCAR) and the Bank of England's 2022 annual cyclical scenario (ACS). However, the 2023 EBA stress test scenario reflects a more recent risk assessment compared with the Federal Reserve and Bank of England. The Federal Reserve released its 2022 stress test scenario before the Russian invasion of Ukraine, while the Bank of England's Annual Cyclical Scenario was prepared based on data and risk assessments with a cut-off date of July 2022, prior to the aggravation of geopolitical tensions and the gas supply cut from Russia.

Chart 12

EBA scenarios versus Bank of England and Federal Reserve System – domestic real GDP decline

Sources: Federal Reserve, Bank of England, ECB and ECB/ESRB calculations.

4. Annex

4.1 Detailed tables

4.1.1 Real GDP

		Historical growth (%)	Baseline growth (%)			Adverse growth (%)			Cumulative growth from the starting point (%)	Minimum growth from the starting point (%)	Level of deviation in 2025 (%)
		2022	2023	2024	2025	2023	2024	2025			
Belgium	BE	3.1	0.6	1.7	1.8	-2.7	-4.9	2.0	-5.7	-7.5	-9.4
Bulgaria	BG	2.8	0.1	3.4	3.5	-4.3	-2.3	2.1	-4.5	-6.5	-10.8
Czech Republic	CZ	2.2	-0.7	2.5	3.1	-4.7	-4.8	2.9	-6.7	-9.3	-11.1
Denmark	DK	2.0	-0.1	1.2	1.6	-3.9	-4.6	0.5	-7.8	-8.2	-10.3
Germany	DE	1.8	-0.5	1.7	1.4	-5.2	-4.3	3.1	-6.4	-9.3	-8.9
Estonia	EE	-0.5	0.4	3.1	4.4	-4.0	-2.2	0.4	-5.7	-6.1	-12.8
Ireland	IE	12.9	4.9	6.6	4.3	-1.3	-3.3	0.8	-3.8	-4.6	-17.6
Greece	GR	6.2	1.5	3.0	2.8	-1.9	-4.5	0.9	-5.5	-6.3	-12.1
Spain	ES	4.6	1.3	2.7	2.1	-2.6	-2.9	0.1	-5.4	-5.4	-10.9
France	FR	2.6	0.3	1.2	1.8	-2.9	-3.9	1.1	-5.7	-6.7	-8.8
Croatia	HR	6.3	1.4	3.0	2.3	-3.5	-5.1	1.8	-6.8	-8.4	-12.8
Italy	IT	3.8	0.4	1.2	1.2	-2.6	-5.7	1.1	-7.2	-8.2	-9.7
Cyprus	CY	5.8	2.5	3.1	3.1	-1.6	-4.6	1.4	-4.8	-6.1	-12.6
Latvia	LV	2.1	-0.3	4.4	3.5	-4.4	-3.1	3.1	-4.4	-7.3	-11.3
Lithuania	LT	2.5	1.3	3.8	3.5	-1.8	-2.6	-0.2	-4.6	-4.6	-12.2
Luxembourg	LU	1.8	1.6	2.6	2.6	-2.6	-3.8	0.4	-5.9	-6.3	-12.0
Hungary	HU	3.5	1.0	4.0	3.5	-3.8	-4.0	4.0	-3.9	-7.6	-11.6
Malta	MT	6.8	3.7	3.6	3.5	-0.4	-5.4	0.4	-5.5	-5.8	-15.0
Netherlands	NL	4.2	0.8	1.6	1.6	-2.2	-3.6	0.3	-5.4	-5.7	-9.0
Austria	AT	4.9	0.6	1.7	1.6	-3.4	-4.0	2.1	-5.3	-7.3	-8.9
Poland	PL	4.6	0.4	1.7	3.2	-3.0	-4.6	2.2	-5.5	-7.5	-10.4
Portugal	PT	6.8	1.5	2.0	1.9	-1.6	-3.1	-0.4	-5.0	-5.0	-10.0
Romania	RO	7.2	2.0	2.1	3.4	-2.9	-5.5	3.6	-5.0	-8.3	-11.8
Slovenia	SI	5.0	0.8	2.4	2.3	-1.5	-2.8	-0.2	-4.4	-4.4	-9.5
Slovakia	SK	1.5	1.1	3.2	2.7	-3.9	-4.2	3.0	-5.2	-8.0	-11.6
Finland	FI	1.9	-0.5	1.1	1.5	-3.6	-3.3	1.0	-5.9	-6.8	-7.8
Sweden	SE	2.7	-0.7	1.1	1.9	-5.0	-3.7	0.8	-7.8	-8.5	-9.8
Euro area	**EA**	**3.4**	**0.5**	**1.9**	**1.8**	**-3.4**	**-4.1**	**1.6**	**-5.9**	**-7.3**	**-9.6**
European Union	**EU**	**3.4**	**0.4**	**1.8**	**1.9**	**-3.5**	**-4.2**	**1.6**	**-6.0**	**-7.5**	**-9.8**
United Kingdom	UK	3.6	0.3	0.6	2.3	-4.8	-4.7	1.0	-8.3	-9.2	-11.2
Norway	NO	3.6	2.6	2.2	1.6	-3.7	-0.9	-0.4	-5.0	-5.0	-10.8
United States	US	1.6	1.0	1.2	1.8	-5.7	0.1	1.1	-4.6	-5.7	-8.3
Japan	JP	1.7	1.6	1.3	0.9	-3.5	-2.8	-1.6	-7.7	-7.7	-11.2
Canada	CA	3.3	1.5	1.6	2.3	-6.3	-1.4	2.7	-5.1	-7.6	-10.1
Switzerland	CH	2.2	0.8	1.8	1.2	-5.7	-2.5	-1.0	-9.0	-9.0	-12.4
Australia & New Zealand	AU	3.6	1.9	1.8	2.0	-6.2	-0.9	0.8	-6.2	-7.0	-11.4
Türkiye	TR	5.0	3.0	3.0	3.0	-5.0	-2.3	-0.4	-7.6	-7.6	-15.4
Russia	RU	-3.4	-2.3	1.5	1.0	-17.1	0.3	2.5	-14.8	-17.1	-14.9
Emerging Asia	AS	4.2	4.7	5.0	5.0	-2.6	2.3	3.7	3.3	-2.6	-10.5
China	CN	3.2	4.4	4.5	4.6	-4.4	2.4	3.9	1.7	-4.4	-10.9
India	IN	6.8	6.1	6.8	6.8	-3.1	2.4	3.0	2.3	-3.1	-15.4
Hong Kong	HK	-0.8	3.9	3.0	2.9	-2.2	-0.7	2.2	-0.7	-2.9	-9.8
Latin America	LA	3.5	1.7	2.4	2.5	-4.7	-1.3	0.6	-5.3	-5.9	-11.3
Brazil	BR	2.8	1.0	1.9	2.0	-4.0	-1.3	-0.2	-5.4	-5.4	-10.0
Mexico	MX	2.1	1.2	1.8	2.1	-4.6	-2.6	0.4	-6.7	-7.1	-11.3
Chile	CL	2.0	-1.0	2.0	2.3	-7.0	-1.3	0.4	-7.9	-8.2	-10.9
Colombia	CO	7.6	2.2	2.8	3.2	-4.6	-0.4	1.5	-3.6	-5.0	-11.1
Peru	PE	2.7	2.6	3.2	3.1	-4.2	0.0	1.4	-2.9	-4.3	-11.1
Rest of the world	WR	4.0	3.7	4.1	4.2	-4.1	-1.0	1.3	-3.9	-5.1	-14.6

Notes: The table reports annual averages. Projections from the NCBs are used as baseline forecasts for EU countries. For non-EU countries, the baseline projections are based on projections from the October 2022 IMF World Economic Outlook.

4.1.2 Unemployment rate

		Historical value (%)	Baseline rate (%)			Adverse rate (%)			Cumulative growth from the starting point (p.p.)	Maximum growth from the starting point (p.p.)	Level of deviation in 2025 (p.p.)
		2022	2023	2024	2025	2023	2024	2025			
Belgium	BE	5.7	6.2	6.2	5.9	7.0	10.3	11.4	5.7	5.7	5.5
Bulgaria	BG	4.6	4.5	4.2	4.1	6.2	7.9	8.8	4.3	4.3	4.7
Czech Republic	CZ	2.5	3.2	3.7	3.6	4.1	6.8	7.5	5.0	5.0	3.9
Denmark	DK	2.4	2.7	3.0	3.0	4.1	8.0	8.2	5.9	5.9	5.3
Germany	DE	3.0	3.4	3.2	3.1	4.6	6.3	7.1	4.1	4.1	4.0
Estonia	EE	5.7	8.4	8.7	7.5	9.6	12.7	13.6	7.9	7.9	6.1
Ireland	IE	4.7	5.3	4.9	4.6	6.3	11.2	12.4	7.7	7.7	7.7
Greece	GR	12.5	11.5	10.4	9.4	12.7	16.1	17.3	4.8	4.8	7.9
Spain	ES	12.8	12.9	12.2	12.0	14.5	17.6	18.5	5.6	5.6	6.5
France	FR	7.3	7.5	8.2	8.3	8.4	11.3	13.3	5.9	5.9	5.0
Croatia	HR	6.9	6.8	6.3	5.7	8.2	11.5	13.4	6.5	6.5	7.7
Italy	IT	8.2	8.2	7.9	7.4	9.1	11.4	12.9	4.7	4.7	5.4
Cyprus	CY	6.7	6.5	5.9	5.5	7.2	9.5	12.5	5.8	5.8	7.0
Latvia	LV	6.9	7.8	7.5	7.2	9.1	12.1	13.4	6.5	6.5	6.2
Lithuania	LT	6.1	6.7	6.2	5.9	7.4	8.7	10.1	4.0	4.0	4.2
Luxembourg	LU	4.8	5.0	4.8	4.7	5.9	9.2	12.6	7.8	7.8	8.0
Hungary	HU	4.1	3.5	3.6	3.3	4.6	8.4	7.8	3.7	4.4	4.5
Malta	MT	3.0	3.0	3.2	3.3	3.5	8.1	10.8	7.8	7.8	7.5
Netherlands	NL	3.6	4.2	4.0	3.5	4.9	8.1	9.3	5.7	5.7	5.8
Austria	AT	4.8	4.9	4.7	4.6	7.0	9.4	9.8	4.9	4.9	5.2
Poland	PL	2.8	3.6	4.8	5.2	4.7	10.1	10.9	8.1	8.1	5.7
Portugal	PT	5.9	5.9	5.9	5.9	7.6	10.1	11.4	5.4	5.4	5.5
Romania	RO	5.5	5.7	5.9	6.0	7.2	10.3	10.8	5.4	5.4	4.8
Slovenia	SI	4.3	4.3	4.1	3.9	5.5	8.6	10.0	5.8	5.8	6.1
Slovakia	SK	6.2	6.5	6.1	5.7	7.4	9.8	11.9	5.7	5.7	6.2
Finland	FI	6.9	7.4	7.2	7.1	9.5	13.5	12.4	5.5	6.7	5.3
Sweden	SE	7.5	7.9	8.2	8.3	10.1	13.4	13.4	5.9	5.9	5.1
Euro area	**EA**	**6.7**	**6.9**	**6.8**	**6.6**	**8.1**	**10.6**	**12.4**	**5.7**	**5.7**	**5.8**
European Union	**EU**	**6.1**	**6.4**	**6.4**	**6.3**	**7.6**	**10.4**	**12.2**	**6.1**	**6.1**	**5.9**
United Kingdom	UK	3.8	4.8	5.0	4.3	6.3	11.0	10.6	6.8	7.2	6.3
Norway	NO	3.9	3.8	3.7	3.7	5.8	6.1	5.9	2.0	2.2	2.2
United States	US	3.7	4.6	5.4	5.4	5.7	7.5	6.7	3.0	3.8	1.3
Japan	JP	2.6	2.4	2.4	2.4	5.5	7.4	8.0	5.4	5.4	5.6
Canada	CA	5.3	5.9	6.2	6.1	9.9	11.5	10.1	4.8	6.3	4.0
Switzerland	CH	2.2	2.4	2.5	2.5	6.1	8.6	9.3	7.0	7.0	6.8
Australia & New Zealand	AU	3.6	3.7	4.2	4.5	8.2	9.7	9.4	5.8	6.1	4.9
Türkiye	TR	10.8	10.5	10.5	10.5	11.8	14.9	14.8	4.0	4.1	4.3
Russia	RU	4.0	4.3	4.4	4.4	12.1	20.6	16.3	12.3	16.6	11.9
Emerging Asia	AS	3.5	5.0	3.2	3.2	6.7	6.9	6.3	2.7	3.4	3.1
China	CN	4.2	4.1	3.9	3.8	6.3	6.2	5.5	1.3	2.1	1.7
India	IN	6.7	6.0	5.4	5.0	7.5	8.7	8.0	1.3	2.0	3.0
Hong Kong	HK	4.5	4.0	3.7	3.4	5.4	9.1	8.0	3.5	4.6	4.6
Latin America	LA	7.5	7.5	7.5	7.5	10.9	12.9	13.1	5.6	5.6	5.6
Brazil	BR	9.8	9.5	9.5	9.5	13.8	14.7	15.0	5.2	5.2	5.5
Mexico	MX	3.4	3.7	3.7	3.8	6.8	9.2	9.5	6.0	6.0	5.7
Chile	CL	7.9	8.3	8.2	7.8	11.5	13.7	13.4	5.6	5.8	5.7
Colombia	CO	11.3	11.1	10.5	10.0	14.2	16.0	15.7	4.4	4.7	5.7
Peru	PE	7.6	7.5	7.4	7.3	10.6	12.9	13.0	5.4	5.4	5.7
Rest of the world	WR	4.3	5.8	4.6	4.5	7.0	8.4	8.3	3.9	4.1	3.8

Notes: The table reports annual averages. Projections from the NCBs are used as baseline forecasts for EU countries. For non-EU countries, the baseline projections are based on projections from the October 2022 IMF World Economic Outlook.

4.1.3 HICP and other consumption price indices

		Historical growth (%)	Baseline growth (%)			Adverse growth (%)			Cumulative growth from the starting point (%)	Minimum growth from the starting point (%)	Level of deviation in 2025 (%)
		2022	2023	2024	2025	2023	2024	2025			
Belgium	BE	10.4	4.4	2.4	1.1	7.0	4.6	2.8	14.9	7.0	6.4
Bulgaria	BG	13.2	7.6	3.7	3.1	9.4	5.0	3.9	19.4	9.4	3.7
Czech Republic	CZ	15.8	8.9	2.4	1.8	11.4	5.0	5.9	23.9	11.4	9.2
Denmark	DK	8.6	4.3	1.7	2.3	8.9	4.8	4.3	19.0	8.9	9.6
Germany	DE	8.6	7.2	4.1	2.8	9.2	6.6	4.1	21.1	9.2	5.6
Estonia	EE	19.4	9.3	2.8	2.1	13.2	3.9	2.2	20.3	13.2	4.9
Ireland	IE	8.1	6.6	3.5	1.9	8.4	7.7	5.3	23.0	8.4	9.4
Greece	GR	9.4	5.8	3.6	2.5	8.3	4.6	3.2	16.9	8.3	4.1
Spain	ES	8.4	4.9	3.6	1.8	9.6	2.4	1.3	13.7	9.6	2.8
France	FR	6.0	6.0	2.5	2.1	8.6	4.2	3.7	17.3	8.6	5.8
Croatia	HR	10.6	7.4	3.2	2.0	9.4	5.0	2.2	17.4	9.4	3.8
Italy	IT	8.8	7.3	2.6	1.9	12.4	5.6	4.4	24.0	12.4	10.4
Cyprus	CY	8.1	3.3	1.7	1.8	5.5	4.3	5.3	15.9	5.5	8.3
Latvia	LV	17.3	10.9	4.4	3.0	13.4	5.5	4.1	24.6	13.4	4.5
Lithuania	LT	18.9	9.5	3.0	2.9	10.4	3.1	3.3	17.5	10.4	1.3
Luxembourg	LU	8.2	2.3	3.6	1.7	5.8	5.1	1.7	13.1	5.8	4.9
Hungary	HU	13.9	12.9	3.2	3.0	16.9	5.5	4.7	29.1	16.9	7.6
Malta	MT	6.1	4.5	2.3	2.0	5.4	2.6	0.7	9.0	5.4	0.0
Netherlands	NL	11.5	4.9	5.0	2.3	6.5	6.9	3.7	18.2	6.5	4.8
Austria	AT	8.6	6.5	3.6	2.9	9.2	4.4	3.9	18.5	9.2	4.3
Poland	PL	14.4	13.0	5.5	3.3	17.7	8.2	4.3	32.8	17.7	7.8
Portugal	PT	8.1	5.8	3.3	2.1	8.3	6.3	5.6	21.6	8.3	8.9
Romania	RO	13.7	12.2	7.0	2.2	15.4	8.6	2.3	28.3	15.4	4.6
Slovenia	SI	9.3	6.8	4.2	2.3	10.5	5.1	2.4	18.9	10.5	4.3
Slovakia	SK	12.2	11.9	7.0	3.2	14.4	8.7	3.7	28.9	14.4	4.3
Finland	FI	7.2	5.0	1.6	1.7	6.5	0.8	2.7	10.3	6.5	1.8
Sweden	SE	7.8	5.1	1.6	2.4	8.1	2.5	3.5	14.7	8.1	4.9
Euro area	**EA**	**8.4**	**6.3**	**3.4**	**2.3**	**9.2**	**5.2**	**3.7**	**19.2**	**9.2**	**6.0**
European Union	**EU**	**9.0**	**6.7**	**3.4**	**2.3**	**9.7**	**5.3**	**3.8**	**19.9**	**9.7**	**6.2**
United Kingdom	UK	11.3	6.3	1.9	2.0	8.6	2.6	2.8	14.7	8.6	3.8
Norway	NO	4.7	3.5	2.5	2.5	7.0	2.7	2.5	12.6	7.0	3.6
United States	US	6.4	2.3	2.1	2.0	6.0	2.8	2.9	12.1	6.0	5.2
Japan	JP	2.4	1.2	1.0	1.0	4.4	1.9	1.6	8.1	4.4	4.7
Canada	CA	6.9	3.2	2.1	1.8	6.1	2.3	3.2	12.0	6.1	4.3
Switzerland	CH	3.8	1.6	1.5	1.1	5.0	1.6	0.9	7.6	5.0	3.2
Australia & New Zealand	AU	7.0	3.1	3.0	2.6	7.1	2.8	3.4	13.8	7.1	4.4
Türkiye	TR	73.5	36.9	21.4	16.1	42.4	22.3	16.6	103.0	42.4	5.3
Russia	RU	12.5	4.0	4.0	4.0	21.3	6.6	4.4	35.1	21.3	20.1
Emerging Asia	AS	4.7	2.9	2.7	2.7	4.7	3.6	3.7	12.5	4.7	3.7
China	CN	2.7	1.8	1.9	2.0	3.2	1.9	3.7	9.0	3.2	3.1
India	IN	6.4	4.9	4.2	4.1	9.0	7.0	6.0	23.6	9.0	8.6
Hong Kong	HK	1.9	2.2	2.5	2.5	3.8	2.9	3.1	10.2	3.8	2.7
Latin America	LA	14.6	9.5	6.8	6.4	14.9	7.5	6.7	31.7	14.9	5.8
Brazil	BR	6.0	4.7	3.0	3.0	9.2	2.1	3.5	15.4	9.2	3.9
Mexico	MX	8.5	4.8	3.5	3.2	10.8	3.7	0.9	16.0	10.8	3.6
Chile	CL	12.2	6.2	3.0	3.0	11.3	3.2	2.7	18.0	11.3	4.7
Colombia	CO	11.0	6.0	3.2	3.0	11.1	5.3	4.7	22.5	11.1	8.7
Peru	PE	6.8	3.0	2.3	2.0	8.0	4.4	3.7	16.8	8.0	8.7
Rest of the world	WR	10.4	5.1	4.0	3.8	9.0	4.7	4.2	18.9	9.0	4.8

Notes: The table reports annual averages. Projections from the NCBs are used as baseline forecasts for EU countries. For non-EU countries, the baseline projections are based on projections from the October 2022 IMF World Economic Outlook.

4.1.4 Residential real estate prices

		Historical growth (%)	Baseline growth (%)			Adverse growth (%)			Cumulative growth from the starting point (%)	Minimum growth from the starting point (%)	Level of deviation in 2025 (%)
		2022	2023	2024	2025	2023	2024	2025			
Belgium	BE	6.3	3.8	2.9	2.1	-7.9	-17.0	-2.4	-25.5	-25.5	-31.7
Bulgaria	BG	12.8	-4.3	-0.2	2.6	-8.4	-6.9	2.3	-12.9	-14.8	-11.1
Czech Republic	CZ	16.8	-2.1	5.8	4.8	-14.6	-17.3	-1.0	-30.1	-30.1	-35.6
Denmark	DK	2.9	-5.6	-1.8	1.2	-14.2	-17.9	-2.5	-31.3	-31.3	-26.8
Germany	DE	7.5	1.2	3.2	3.5	-9.4	-15.9	-2.5	-25.8	-25.8	-31.4
Estonia	EE	20.3	-1.3	3.5	8.1	-10.4	-12.2	4.2	-18.0	-21.3	-25.7
Ireland	IE	13.1	7.4	2.5	-0.3	-1.1	-8.9	-1.3	-11.1	-11.1	-19.0
Greece	GR	10.3	4.7	3.4	3.0	-2.1	-7.0	2.9	-6.3	-9.0	-15.9
Spain	ES	7.3	2.7	1.2	1.0	-6.5	-12.8	-1.2	-19.4	-19.4	-23.2
France	FR	6.1	1.1	0.7	1.5	-6.3	-12.0	-2.6	-19.7	-19.7	-22.3
Croatia	HR	12.5	4.3	5.9	9.3	-8.8	-17.7	1.0	-24.2	-25.0	-37.2
Italy	IT	3.9	1.1	0.7	0.4	-2.1	-4.2	-0.6	-6.8	-6.8	-8.7
Cyprus	CY	5.1	3.7	1.4	1.5	-1.5	-6.4	-0.1	-7.9	-7.9	-13.8
Latvia	LV	14.1	7.0	9.3	9.4	-2.5	-12.0	-2.7	-16.5	-16.5	-34.7
Lithuania	LT	17.9	1.4	-6.1	-3.8	-6.8	-12.7	0.2	-18.4	-18.6	-10.9
Luxembourg	LU	9.5	6.3	5.1	5.3	-9.6	-22.0	-2.2	-31.0	-31.0	-41.4
Hungary	HU	16.8	16.1	7.0	5.0	-4.0	-22.2	2.0	-23.8	-25.3	-41.6
Malta	MT	5.5	3.9	3.5	3.5	-2.5	-8.1	0.8	-9.7	-10.4	-18.8
Netherlands	NL	13.9	-3.1	-3.3	0.1	-13.5	-19.8	-2.6	-32.4	-32.4	-27.9
Austria	AT	10.9	1.3	2.2	3.6	-11.4	-20.3	-2.6	-31.2	-31.2	-35.8
Poland	PL	16.4	-0.8	-9.0	-8.3	-2.2	-11.0	-8.7	-20.6	-20.6	-4.0
Portugal	PT	11.7	2.5	3.0	2.7	-9.1	-16.9	-1.3	-25.4	-25.4	-31.3
Romania	RO	5.7	2.8	1.6	1.1	-4.0	-7.0	-0.6	-11.3	-11.3	-16.0
Slovenia	SI	14.5	6.4	4.5	2.2	-1.7	-9.3	-1.9	-12.5	-12.5	-23.0
Slovakia	SK	21.6	1.9	3.0	5.0	-9.0	-17.7	0.9	-24.4	-25.1	-31.5
Finland	FI	1.3	-2.0	1.7	2.0	-8.3	-9.0	-0.4	-16.9	-16.9	-18.3
Sweden	SE	3.7	-11.1	-3.0	2.3	-17.7	-15.6	-4.0	-33.3	-33.3	-24.5
Euro area	**EA**	**7.6**	**1.5**	**1.6**	**2.0**	**-7.1**	**-12.8**	**-1.7**	**-20.4**	**-20.4**	**-24.3**
European Union	**EU**	**8.0**	**0.8**	**1.0**	**1.6**	**-7.6**	**-12.9**	**-1.9**	**-21.1**	**-21.1**	**-23.8**
United Kingdom	UK	4.4	4.4	4.4	4.4	-12.3	-7.6	-3.4	-21.7	-21.7	-31.1
Norway	NO	6.0	6.0	6.0	6.0	-22.4	-8.1	3.1	-26.5	-28.7	-38.3
United States	US	7.8	7.8	7.8	7.8	-12.3	-7.6	-3.4	-21.7	-21.7	-37.6
Japan	JP	2.5	2.5	2.5	2.5	-12.3	-7.6	-3.4	-21.7	-21.7	-27.4
Canada	CA	4.1	4.1	4.1	4.1	-12.3	-7.6	-3.4	-21.7	-21.7	-30.6
Switzerland	CH	4.9	4.9	4.9	4.9	-12.3	-7.6	-3.4	-21.7	-21.7	-32.3
Australia & New Zealand	AU	7.1	7.1	7.1	7.1	-12.3	-7.6	-3.4	-21.7	-21.7	-36.2
Türkiye	TR	21.5	21.5	21.5	21.5	-12.3	-7.6	-3.4	-21.7	-21.7	-56.3
Russia	RU	10.2	10.2	10.2	10.2	-12.3	-7.6	-3.4	-21.7	-21.7	-41.6
Emerging Asia	AS	3.2	3.2	3.2	3.2	-12.3	-7.6	-3.4	-21.7	-21.7	-28.7
China	CN	3.8	3.8	3.8	3.8	-12.3	-7.6	-3.4	-21.7	-21.7	-29.9
India	IN	2.8	2.8	2.8	2.8	-12.3	-7.6	-3.4	-21.7	-21.7	-27.9
Hong Kong	HK	3.8	3.8	3.8	3.8	-12.3	-7.6	-3.4	-21.7	-21.7	-29.9
Latin America	LA	5.7	5.7	5.7	5.7	-12.3	-7.6	-3.4	-21.7	-21.7	-33.7
Brazil	BR	6.4	6.4	6.4	6.4	-12.3	-7.6	-3.4	-21.7	-21.7	-35.0
Mexico	MX	7.4	7.4	7.4	7.4	-12.3	-7.6	-3.4	-21.7	-21.7	-36.8
Chile	CL	9.0	9.0	9.0	9.0	-12.3	-7.6	-3.4	-21.7	-21.7	-39.5
Colombia	CO	4.9	4.9	4.9	4.9	-12.3	-7.6	-3.4	-21.7	-21.7	-32.3
Peru	PE	5.7	5.7	5.7	5.7	-12.3	-7.6	-3.4	-21.7	-21.7	-33.7
Rest of the world	WR	4.0	4.0	4.0	4.0	-12.3	-7.6	-3.4	-21.7	-21.7	-30.4

Notes: The table reports annual averages. Projections from the NCBs are used as baseline forecasts for EU countries. For non-EU countries, the baseline projections are based on projections from the October 2022 IMF World Economic Outlook.

4.1.5 Commercial real estate prices

		Baseline growth (%)			Adverse growth (%)			Cumulative growth from the starting point (%)	Minimum growth from the starting point (%)	Level of deviation in 2025 (%)
		2023	2024	2025	2023	2024	2025			
Belgium	BE	1.8	1.7	1.7	-18.7	-13.8	-5.3	-33.7	-33.7	-37.1
Bulgaria	BG	-0.6	-0.6	-0.6	-14.2	-9.9	-3.7	-25.5	-25.5	-24.2
Czech Republic	CZ	2.3	2.2	2.2	-17.9	-13.1	-5.0	-32.2	-32.2	-36.5
Denmark	DK	-1.2	-1.2	-1.2	-18.0	-13.2	-5.0	-32.4	-32.4	-29.9
Germany	DE	-0.7	-0.7	-0.7	-18.6	-13.7	-5.3	-33.4	-33.4	-31.9
Estonia	EE	2.9	2.9	2.8	-17.0	-12.3	-4.7	-30.5	-30.5	-36.2
Ireland	IE	2.4	2.4	2.3	-15.7	-11.2	-4.2	-28.3	-28.3	-33.2
Greece	GR	3.2	3.1	3.0	-9.2	-6.1	-2.2	-16.6	-16.6	-24.0
Spain	ES	1.4	1.4	1.3	-14.3	-10.0	-3.7	-25.7	-25.7	-28.6
France	FR	0.8	0.7	0.7	-15.0	-10.6	-3.9	-26.9	-26.9	-28.6
Croatia	HR	5.8	5.5	5.2	-16.5	-11.8	-4.5	-29.7	-29.7	-40.1
Italy	IT	0.6	0.6	0.6	-10.8	-7.2	-2.6	-19.4	-19.4	-20.8
Cyprus	CY	1.8	1.8	1.8	-8.9	-5.8	-2.1	-16.0	-16.0	-20.4
Latvia	LV	7.9	7.3	6.8	-15.9	-11.3	-4.3	-28.6	-28.6	-42.3
Lithuania	LT	-2.4	-2.4	-2.5	-18.0	-13.2	-5.1	-32.4	-32.4	-27.2
Luxembourg	LU	5.0	4.7	4.5	-16.1	-11.6	-4.4	-29.1	-29.1	-38.3
Hungary	HU	8.4	7.7	7.2	-16.3	-11.7	-4.4	-29.4	-29.4	-43.6
Malta	MT	3.2	3.1	3.0	-8.3	-5.4	-1.9	-14.9	-14.9	-22.3
Netherlands	NL	-1.5	-1.6	-1.6	-19.1	-14.2	-5.5	-34.4	-34.4	-31.2
Austria	AT	0.5	0.5	0.5	-16.8	-12.1	-4.6	-30.2	-30.2	-31.4
Poland	PL	-3.9	-4.0	-4.2	-19.1	-14.2	-5.5	-34.4	-34.4	-25.7
Portugal	PT	2.1	2.1	2.0	-17.2	-12.4	-4.7	-30.9	-30.9	-35.0
Romania	RO	1.6	1.6	1.5	-12.5	-8.5	-3.1	-22.4	-22.4	-26.0
Slovenia	SI	3.8	3.7	3.6	-12.4	-8.5	-3.1	-22.3	-22.3	-30.3
Slovakia	SK	2.9	2.8	2.7	-17.9	-13.0	-5.0	-32.2	-32.2	-37.6
Finland	FI	0.5	0.5	0.5	-16.4	-11.8	-4.5	-29.6	-29.6	-30.6
Sweden	SE	-1.5	-1.5	-1.5	-19.0	-14.1	-5.5	-34.3	-34.3	-31.3
Euro area	**EA**	**1.4**	**1.4**	**1.4**	**-16.1**	**-11.5**	**-4.3**	**-28.9**	**-28.9**	**-30.5**
European Union	**EU**	**1.1**	**1.1**	**1.1**	**-16.3**	**-11.7**	**-4.4**	**-29.3**	**-29.3**	**-30.4**
United Kingdom	UK	4.4	4.4	4.4	-16.0	-11.0	-4.0	-28.2	-28.2	-36.9
Norway	NO	6.0	6.0	6.0	-23.0	-18.0	-4.0	-39.4	-39.4	-49.2
United States	US	7.8	7.8	7.8	-16.0	-11.0	-4.0	-28.2	-28.2	-42.8
Japan	JP	2.5	2.5	2.5	-16.0	-11.0	-4.0	-28.2	-28.2	-33.4
Canada	CA	4.1	4.1	4.1	-16.0	-11.0	-4.0	-28.2	-28.2	-36.4
Switzerland	CH	4.9	4.9	4.9	-16.0	-11.0	-4.0	-28.2	-28.2	-37.9
Australia & New Zealand	AU	7.1	7.1	7.1	-16.0	-11.0	-4.0	-28.2	-28.2	-41.5
Türkiye	TR	21.5	21.5	21.5	-16.0	-11.0	-4.0	-28.2	-28.2	-60.0
Russia	RU	10.2	10.2	10.2	-16.0	-11.0	-4.0	-28.2	-28.2	-46.4
Emerging Asia	AS	3.2	3.2	3.2	-16.0	-11.0	-4.0	-28.2	-28.2	-34.7
China	CN	3.8	3.8	3.8	-16.0	-11.0	-4.0	-28.2	-28.2	-35.7
India	IN	2.8	2.8	2.8	-16.0	-11.0	-4.0	-28.2	-28.2	-33.9
Hong Kong	HK	3.8	3.8	3.8	-16.0	-11.0	-4.0	-28.2	-28.2	-35.7
Latin America	LA	5.7	5.7	5.7	-16.0	-11.0	-4.0	-28.2	-28.2	-39.2
Brazil	BR	6.4	6.4	6.4	-16.0	-11.0	-4.0	-28.2	-28.2	-40.4
Mexico	MX	7.4	7.4	7.4	-16.0	-11.0	-4.0	-28.2	-28.2	-42.1
Chile	CL	9.0	9.0	9.0	-16.0	-11.0	-4.0	-28.2	-28.2	-44.5
Colombia	CO	4.9	4.9	4.9	-16.0	-11.0	-4.0	-28.2	-28.2	-37.9
Peru	PE	5.7	5.7	5.7	-16.0	-11.0	-4.0	-28.2	-28.2	-39.2
Rest of the world	WR	4.0	4.0	4.0	-16.0	-11.0	-4.0	-28.2	-28.2	-36.2

Notes: The table reports annual averages. Public data are not available for almost any country. For this reason, the starting points are not provided. The baseline for all countries has been projected by ECB staff.

4.1.6 Long-term rates

		Starting point rates (%) Average	Starting point rates (%) Latest	Baseline rates (%)			Adverse rates (%)		
		2022	2022	2023	2024	2025	2023	2024	2025
Belgium	BE	1.71	2.74	2.52	2.58	2.70	5.69	4.83	4.65
Bulgaria	BG	2.60	6.00	2.97	3.81	4.32	7.07	6.56	6.62
Czech Republic	CZ	4.45	4.82	5.29	4.51	4.47	9.39	7.26	6.77
Denmark	DK	1.51	2.39	2.05	2.03	2.04	4.29	3.83	3.63
Germany	DE	1.17	2.13	1.99	1.97	1.99	4.23	3.77	3.58
Estonia	EE								
Ireland	IE	1.49	2.60	2.43	2.48	2.55	4.67	4.28	4.14
Greece	GR	3.48	4.22	4.18	4.14	4.13	8.28	6.89	6.43
Spain	ES	2.21	3.18	2.92	3.04	3.17	7.02	5.79	5.47
France	FR	1.60	2.63	2.46	2.50	2.58	4.69	4.30	4.17
Croatia	HR	2.76	3.53	3.53	3.49	3.49	7.63	6.24	5.79
Italy	IT	3.06	4.04	3.86	4.02	4.16	7.96	6.77	6.47
Cyprus	CY	3.08	4.11	4.19	4.15	4.15	8.29	6.90	6.45
Latvia	LV	2.29	3.94	3.69	3.65	3.65	6.86	5.91	5.60
Lithuania	LT	2.53	4.15	3.89	3.85	3.84	7.06	6.10	5.80
Luxembourg	LU	1.66	2.47	2.58	2.54	2.53	4.82	4.34	4.12
Hungary	HU	7.73	8.78	8.08	7.79	7.64	12.18	10.54	9.94
Malta	MT	2.36	3.56	3.46	3.42	3.42	6.63	5.68	5.37
Netherlands	NL	1.39	2.43	2.26	2.26	2.28	4.50	4.05	3.87
Austria	AT	1.62	2.75	2.50	2.57	2.69	4.74	4.37	4.28
Poland	PL	6.09	6.64	7.78	7.76	7.76	11.89	10.51	10.07
Portugal	PT	2.08	2.99	2.88	2.98	3.12	6.98	5.73	5.42
Romania	RO	7.65	8.10	9.05	8.59	7.97	13.15	11.34	10.27
Slovenia	SI	2.19	3.35	3.46	3.68	3.79	6.63	5.94	5.75
Slovakia	SK	2.10	3.33	3.28	3.24	3.24	5.52	5.04	4.83
Finland	FI	1.66	2.72	2.57	2.63	2.70	4.81	4.43	4.29
Sweden	SE	1.51	1.98	2.25	2.50	2.71	4.49	4.30	4.30
Euro area	**EA**	**1.79**	**2.79**	**2.62**	**2.66**	**2.74**	**5.42**	**4.75**	**4.54**
European Union	**EU**	**2.15**	**3.11**	**3.01**	**3.04**	**3.10**	**5.90**	**5.17**	**4.94**
United Kingdom	UK	2.38	3.37	3.35	3.45	3.59	6.57	5.71	5.56
Norway	NO	2.86	3.06	3.07	3.32	3.07	5.25	5.07	4.54
United States	US	2.95	3.62	3.63	3.45	3.40	5.82	5.21	4.87
Japan	JP	0.22	0.32	0.34	0.50	0.67	2.52	2.25	2.14
Canada	CA	2.77	2.96	4.04	3.65	3.41	6.22	5.40	4.88
Switzerland	CH	0.81	1.30	1.60	2.00	2.00	3.78	3.76	3.47
Australia	AU	3.43	3.59	4.38	3.78	3.68	6.56	5.54	5.15
New Zealand	NZ	3.95	4.22	5.90	5.26	4.82	8.08	7.02	6.30
Türkiye	TR	16.65	10.53	30.86	25.26	18.24	35.02	28.08	20.76
Russia	RU	9.93	10.35	6.50	6.00	6.00	10.66	8.82	8.51
Emerging Asia	AS	3.82	4.15	7.88	7.83	7.48	11.73	10.46	9.81
China	CN	1.43	1.73	2.95	2.95	2.95	7.11	5.77	5.47
India	IN	7.17	7.28	14.81	14.81	14.81	18.97	17.62	17.32
Hong Kong	HK	2.85	3.44	5.88	5.73	4.68	9.10	7.99	6.65
Latin America	LA	9.39	9.58	9.49	7.83	6.76	13.65	10.64	9.28
Brazil	BR	12.53	13.01	12.66	10.45	9.03	16.82	13.26	11.54
Mexico	MX	8.80	8.92	8.89	7.34	6.34	13.05	10.15	8.86
Chile	CL	6.07	5.30	6.13	5.06	4.37	10.29	7.87	6.89
Colombia	CO	11.41	12.83	11.53	9.52	8.22	15.69	12.33	10.74
Peru	PE	8.13	7.84	8.22	6.78	5.86	12.37	9.59	8.37
Ukraine	UA	8.02	7.31	8.02	7.40	7.40	12.18	10.22	9.92
Angola	AO	19.38	19.64	19.49	17.70	16.56	23.64	20.52	19.07
Macao	MO	1.47	1.47	2.51	2.45	1.95	6.67	5.26	4.47
Mozambique	MZ	14.65	14.91	14.76	12.97	11.83	18.92	15.79	14.35
South Africa	ZA	10.10	10.36	10.21	8.42	7.28	14.36	11.24	9.79
Rest of the world	WR	2.95	3.62	3.63	3.45	3.40	7.79	6.27	5.91

Notes: The table reports annual averages. The baseline projections for EU countries, except Estonia, are based on market data, data collection from central banks and ECB staff computations. Due to the absence of liquid benchmark bonds issued by Estonia, paths of long-term interest rates are not provided for this country. The baseline for other countries is based on projections from the October 2022 IMF World Economic Outlook.

4.1.7 Stock prices

	Deviation from the starting point (%)		
	2023	**2024**	**2025**
European Union	**-55**	**-48**	**-43**
Norway	-50	-41	-36
United Kingdom	-58	-51	-46
United States	-58	-50	-45
Japan	-49	-40	-38
Canada	-53	-46	-41
Switzerland	-43	-39	-35
Australia & New Zealand	-51	-44	-39
Rest of the world	-53	-46	-41

Note: Under the baseline scenario, stock prices are assumed to remain unchanged.

4.1.8 Foreign demand and commodity prices

	Level deviation from starting point (%)*		
	2023	**2024**	**2025**
Oil prices	53.9	41.4	41.4
Other non-energy commodity prices	29.5	34.9	34.9
Metal prices	43.0	53.9	81.4
Gas prices (level in EUR/MWh)	180.0	180.0	180.0
EU foreign demand	-7.6	-13.5	-16.5
Euro area foreign demand	-8.6	-14.4	-17.5

*unless otherwise indicated
Note: Under the baseline scenario, commodity prices are assumed to remain at the same level as at the cut-off date.

4.1.9 iTraxx indices

	Historical level	Baseline level			Adverse level		
	2022	**2023**	**2024**	**2025**	**2023**	**2024**	**2025**
iTraxx Overall 5y	94	97	100	102	283	232	215
iTraxx Crossover 5y	463	466	469	471	849	721	687
iTraxx Sen-financials 5y	104	107	110	112	371	317	287
iTraxx Sub-financials 5y	195	197	200	202	647	509	468

Note: Under the baseline scenario, iTraxx indexes are assumed to follow the growth of the swap rates.

4.1.10 Exchange rates

	Historical rates	Baseline rates			Adverse rates		
	2022	2023	2024	2025	2023	2024	2025
EURCZK	24.59	24.59	24.59	24.59	25.15	25.30	25.45
EURDKK	7.44	7.44	7.44	7.44	7.44	7.44	7.44
EURHUF	389.35	389.35	389.35	389.35	419.90	423.42	427.07
EURPLN	4.69	4.69	4.69	4.69	5.02	5.06	5.11
EURRON	4.93	4.93	4.93	4.93	5.17	5.19	5.21
EURSEK	10.60	10.60	10.60	10.60	10.60	10.60	10.60
EURGBP	0.85	0.85	0.85	0.85	0.85	0.85	0.85
EURNOK	10.07	10.07	10.07	10.07	10.07	10.07	10.07
EURUSD	1.05	1.05	1.05	1.05	1.05	1.05	1.05
EURCHF	1.01	1.01	1.01	1.01	1.01	1.01	1.01
EURTRY	17.15	17.15	17.15	17.15	21.56	21.80	22.05
EURRUB	74.64	74.64	74.64	74.64	83.91	85.25	86.65
EURBRL	5.43	5.43	5.43	5.43	6.08	6.16	6.25
EURMXN	21.25	21.25	21.25	21.25	23.22	23.48	23.74
EURCLP	279.33	279.33	279.33	279.33	298.77	301.76	304.96
EURAUD	1.51	1.51	1.51	1.51	1.51	1.51	1.51
EURCAD	1.36	1.36	1.36	1.36	1.36	1.36	1.36
EURHKD	8.25	8.25	8.25	8.25	8.25	8.25	8.25
EURZAR	17.09	17.09	17.09	17.09	18.65	18.88	19.13
EURBGN	1.96	1.96	1.96	1.96	1.96	1.96	1.96
EURCOP	4410.23	4410.23	4410.23	4410.23	4870.13	4921.76	4921.76
EURINR	82.27	82.27	82.27	82.27	92.21	92.98	93.82
EURCNY	7.05	7.05	7.05	7.05	7.05	7.05	7.05
EURJPY	137.56	137.56	137.56	137.56	137.56	137.56	137.56
EURNZD	1.66	1.66	1.66	1.66	1.66	1.66	1.66
EURPEN	4.04	4.04	4.04	4.04	4.47	4.51	4.55
EURUAH	33.92	33.92	33.92	33.92	44.45	45.06	45.70
EURAOA	479.95	479.95	479.95	479.95	594.08	599.43	605.27
EURMOP	8.50	8.50	8.50	8.50	9.29	9.36	9.43
EURMZN	67.28	67.28	67.28	67.28	82.19	83.13	84.17
EUR-rest of the world	1.05	1.05	1.05	1.05	1.15	1.16	1.17

Notes: Under the baseline, exchange rates are assumed to remain unchanged. Positive shocks imply an appreciation of the euro.

4.1.11 Swap rates

		Starting point rates (%) - Average	Starting point rates (%) - Latest	Baseline rates (%)			Adverse rates (%)		
		2022	2022	2023	2024	2025	2023	2024	2025
EUR	1M	0.10	1.73	2.67	2.46	2.23	4.19	3.67	3.26
	3M	0.35	2.07	2.91	2.71	2.47	4.43	3.92	3.51
	1Y	1.11	3.03	3.67	3.47	3.23	5.19	4.68	4.26
	2Y	1.48	3.09	3.58	3.38	3.14	5.18	4.65	4.23
	3Y	1.60	2.98	3.49	3.29	3.05	5.16	4.62	4.19
	5Y	1.73	2.87	3.31	3.11	2.88	4.98	4.44	4.01
	7Y	1.81	2.81	3.13	2.93	2.70	4.82	4.28	3.85
	10Y	1.92	2.81	2.85	2.66	2.43	4.57	4.03	3.60
	20Y	1.92	2.55	2.71	2.53	2.29	4.49	3.94	3.50
	30Y	1.65	2.15	2.57	2.39	2.15	4.28	3.75	3.31
CZK	1M	5.50	7.33	7.05	5.26	4.46	8.79	6.65	5.64
	3M	5.50	7.33	7.05	5.26	4.46	8.79	6.65	5.64
	1Y	6.59	7.05	6.89	5.18	4.44	8.63	6.57	5.62
	2Y	6.02	6.04	6.67	5.07	4.41	8.41	6.46	5.59
	3Y	5.48	5.38	6.45	4.96	4.38	8.20	6.35	5.56
	5Y	4.96	4.84	6.02	4.74	4.31	7.77	6.13	5.50
	7Y	4.68	4.61	5.59	4.53	4.25	7.39	5.96	5.48
	10Y	4.33	4.36	4.94	4.20	4.16	7.12	5.93	5.64
	20Y	4.36	4.42	4.97	4.23	4.19	6.99	5.84	5.56
	30Y	4.36	4.42	4.97	4.23	4.19	6.99	5.84	5.56
DKK	1M	0.35	1.97	2.40	2.18	1.98	3.92	3.38	3.01
	3M	0.43	2.06	2.49	2.26	2.06	4.01	3.47	3.09
	1Y	1.39	3.18	3.44	3.21	3.01	4.96	4.42	4.05
	2Y	1.74	3.23	3.31	3.10	2.93	4.90	4.37	4.01
	3Y	1.86	3.12	3.18	3.00	2.84	4.85	4.33	3.98
	5Y	1.98	3.01	2.91	2.78	2.67	4.58	4.11	3.81
	7Y	2.06	2.96	2.65	2.57	2.51	4.34	3.92	3.66
	10Y	2.16	2.94	2.25	2.24	2.25	3.97	3.61	3.42
	20Y	2.14	2.69	2.23	2.22	2.23	4.00	3.64	3.44
	30Y	2.14	2.69	2.23	2.22	2.23	3.93	3.58	3.39
HUF	1M	6.52	11.72	10.00	7.75	6.75	12.43	9.68	8.40
	3M	6.52	11.72	10.00	7.75	6.75	12.43	9.68	8.40
	1Y	11.01	15.30	14.50	12.25	11.25	16.93	14.18	12.90
	2Y	10.40	13.38	13.70	11.68	10.79	16.13	13.61	12.44
	3Y	9.69	12.06	12.90	11.11	10.33	15.33	13.05	11.98
	5Y	8.60	10.30	11.30	9.98	9.41	13.74	11.92	11.07
	7Y	8.01	9.41	9.70	8.85	8.50	12.14	10.79	10.16
	10Y	7.67	8.91	7.30	7.15	7.12	9.79	9.12	8.81
	20Y	7.55	8.78	7.18	7.02	7.00	9.70	9.03	8.71
	30Y	7.55	8.78	7.18	7.02	7.00	9.70	9.03	8.71
PLN	1M	4.99	6.91	7.04	5.44	4.85	8.87	6.91	6.10
	3M	4.99	6.91	7.04	5.44	4.85	8.87	6.91	6.10
	1Y	6.81	7.28	8.85	7.26	6.67	10.69	8.72	7.92
	2Y	6.63	6.80	8.60	7.04	6.47	10.44	8.50	7.72
	3Y	6.31	6.30	8.35	6.82	6.27	10.19	8.28	7.52
	5Y	5.93	5.89	7.86	6.38	5.88	9.70	7.84	7.13
	7Y	5.77	5.78	7.36	5.93	5.48	9.27	7.45	6.78
	10Y	5.68	5.80	6.61	5.27	4.88	8.58	6.83	6.22
	20Y	6.01	6.15	6.61	5.27	4.88	8.63	6.88	6.26
	30Y	6.01	6.15	6.61	5.27	4.88	8.63	6.88	6.26
RON	1M	3.27	4.14	7.78	6.53	4.09	9.98	8.29	5.59
	3M	3.27	4.14	7.78	6.53	4.09	9.98	8.29	5.59
	1Y	6.55	8.28	11.05	9.81	7.36	13.26	11.56	8.86
	2Y	6.40	8.18	10.71	9.55	7.31	12.91	11.30	8.81
	3Y	6.23	7.89	10.37	9.29	7.25	12.57	11.05	8.75
	5Y	5.87	7.59	9.68	8.78	7.14	12.35	10.90	8.96
	7Y	5.91	7.55	8.99	8.26	7.03	12.12	10.76	9.16
	10Y	7.42	6.96	7.96	7.49	6.87	11.09	9.99	9.00
	20Y	7.42	6.96	7.96	7.49	6.87	11.09	9.99	9.00
	30Y	7.42	6.96	7.96	7.49	6.87	11.09	9.99	9.00
BGN	1M	1.11	1.41	2.64	2.77	2.86	4.85	4.53	4.36
	3M	1.11	1.41	2.64	2.77	2.86	4.85	4.53	4.36
	1Y	2.23	2.81	3.76	3.89	3.97	5.96	5.64	5.47
	2Y	2.18	2.78	3.76	3.95	4.07	5.96	5.70	5.57
	3Y	2.12	2.68	3.76	4.01	4.18	6.20	5.94	5.83
	5Y	2.00	2.58	3.76	4.12	4.38	6.43	6.25	6.19
	7Y	2.01	2.57	3.77	4.24	4.58	6.90	6.74	6.71
	10Y	2.52	2.37	3.77	4.42	4.89	6.91	6.92	7.02
	20Y	2.52	2.37	3.77	4.42	4.89	6.91	6.92	7.02
	30Y	2.52	2.37	3.77	4.42	4.89	6.91	6.92	7.02
SEK	1M	1.03	2.65	2.90	3.04	3.07	4.50	4.32	4.16
	3M	1.03	2.57	2.90	3.04	3.07	4.50	4.32	4.16
	1Y	1.77	3.25	3.64	3.78	3.81	5.24	5.06	4.90
	2Y	2.17	3.27	3.53	3.68	3.74	5.13	4.96	4.82
	3Y	2.29	3.12	3.42	3.59	3.66	5.09	4.92	4.79
	5Y	2.32	2.92	3.21	3.40	3.51	4.88	4.73	4.64
	7Y	2.35	2.85	2.99	3.20	3.36	4.63	4.55	4.51
	10Y	2.36	2.76	2.67	2.92	3.13	4.38	4.28	4.29
	20Y	2.33	2.57	2.64	2.89	3.10	4.34	4.25	4.26
	30Y	2.33	2.57	2.64	2.89	3.10	4.34	4.25	4.26
GBP	1M	1.58	3.40	3.28	2.67	2.24	5.22	4.22	3.56
	3M	1.89	3.67	3.60	2.99	2.55	5.54	4.54	3.87
	1Y	2.77	4.39	4.47	3.87	3.43	6.41	5.41	4.75
	2Y	3.00	4.37	4.36	3.83	3.46	6.30	5.38	4.78
	3Y	2.94	4.18	4.25	3.80	3.49	6.21	5.36	4.82
	5Y	2.76	3.90	4.02	3.73	3.55	6.00	5.31	4.89
	7Y	2.61	3.67	3.80	3.67	3.61	5.74	5.21	4.93
	10Y	2.49	3.50	3.46	3.57	3.70	5.45	5.15	5.05
	20Y	2.35	3.33	3.32	3.43	3.56	5.13	4.87	4.79
	30Y	2.24	3.20	3.21	3.32	3.45	4.99	4.73	4.66

NOK	1M	1.03	1.52	3.11	3.04	2.76	4.63	4.25	3.79
	3M	1.33	2.17	3.41	3.34	3.06	4.93	4.55	4.09
	1Y	2.77	3.66	4.85	4.78	4.50	6.37	5.99	5.54
	2Y	3.02	3.52	4.67	3.83	3.46	6.19	5.04	4.49
	3Y	3.06	3.36	4.25	3.80	3.49	5.68	4.94	4.47
	5Y	3.02	3.16	4.02	3.73	3.55	5.38	4.81	4.47
	7Y	3.02	3.13	3.80	3.67	3.61	5.22	4.80	4.57
	10Y	3.01	3.12	3.22	3.47	3.22	4.55	4.53	4.12
	20Y	2.80	2.90	3.01	3.26	3.01	4.45	4.41	3.99
	30Y	2.80	2.90	3.01	3.26	3.01	4.45	4.41	3.99
CHF	1M	-0.08	0.30	0.50	0.75	1.00	1.98	1.93	2.01
	3M	-0.08	0.91	0.50	0.75	1.00	1.98	1.93	2.01
	1Y	0.34	1.29	0.92	1.17	1.42	2.40	2.35	2.43
	2Y	0.67	1.44	1.06	1.32	1.55	2.54	2.50	2.55
	3Y	0.77	1.41	1.19	1.48	1.67	2.60	2.59	2.62
	5Y	0.98	1.52	1.46	1.78	1.92	2.79	2.83	2.82
	7Y	1.16	1.62	1.73	2.08	2.17	3.09	3.16	3.09
	10Y	1.34	1.73	2.14	2.54	2.54	3.54	3.65	3.49
	20Y	1.51	1.79	2.30	2.70	2.70	3.69	3.81	3.65
	30Y	1.40	1.68	2.20	2.60	2.60	3.62	3.73	3.56
USD	1M	0.74	1.51	3.10	2.64	1.72	4.95	4.11	2.97
	3M	2.22	4.53	4.58	4.13	3.20	6.43	5.59	4.45
	1Y	3.15	5.06	5.52	5.06	4.13	7.36	6.52	5.38
	2Y	3.26	4.59	5.31	4.88	4.05	7.15	6.35	5.31
	3Y	3.17	4.17	5.11	4.71	3.98	7.00	6.22	5.26
	5Y	3.04	3.79	4.70	4.36	3.82	6.65	5.91	5.15
	7Y	2.99	3.65	4.28	4.01	3.67	6.26	5.59	5.01
	10Y	2.99	3.57	3.67	3.49	3.43	5.63	5.05	4.77
	20Y	2.98	3.49	3.67	3.49	3.43	5.51	4.95	4.68
	30Y	2.80	3.24	3.48	3.30	3.25	5.32	4.76	4.49
CAD	1M	2.73	4.82	4.72	3.76	3.21	6.65	5.30	4.52
	3M	2.58	4.70	4.56	3.60	3.05	6.49	5.14	4.37
	1Y	3.32	4.77	5.31	4.35	3.80	7.24	5.89	5.11
	2Y	3.36	4.26	5.22	4.33	3.81	7.15	5.86	5.12
	3Y	3.30	3.86	5.13	4.30	3.82	7.10	5.87	5.16
	5Y	3.17	3.45	4.96	4.25	3.84	6.92	5.82	5.18
	7Y	3.17	3.38	4.79	4.20	3.86	6.78	5.80	5.22
	10Y	3.25	3.41	4.52	4.13	3.89	6.41	5.63	5.18
	20Y	3.41	3.56	4.68	4.29	4.05	6.45	5.69	5.25
	30Y	3.41	3.56	4.68	4.29	4.05	6.45	5.69	5.25
AUD	1M	1.31	3.00	3.34	2.89	2.89	5.26	4.42	4.19
	3M	1.50	3.10	3.53	3.08	3.08	5.44	4.60	4.38
	1Y	2.55	3.66	4.58	4.13	4.13	6.49	5.65	5.43
	2Y	2.98	3.76	4.58	4.12	4.11	6.49	5.64	5.40
	3Y	3.13	3.72	4.58	4.10	4.08	6.49	5.62	5.37
	5Y	3.28	3.77	4.58	4.07	4.02	6.48	5.58	5.31
	7Y	3.41	3.91	4.59	4.04	3.97	6.51	5.57	5.28
	10Y	3.64	4.18	4.59	3.99	3.89	6.56	5.55	5.22
	20Y	3.65	4.20	4.60	4.00	3.90	6.72	5.69	5.34
	30Y	3.65	4.20	4.60	4.00	3.90	6.72	5.69	5.34
NZD	1M	4.32	6.01	5.07	4.19	3.57	6.98	5.71	4.86
	3M	4.93	6.53	5.68	4.81	4.18	7.59	6.33	5.48
	1Y	8.40	9.50	9.15	8.27	7.65	11.06	9.79	8.95
	2Y	9.82	10.60	10.57	9.70	9.07	12.48	11.22	10.37
	3Y	10.31	10.89	11.06	10.18	9.56	12.96	11.70	10.85
	5Y	10.81	11.30	11.56	10.69	10.06	13.46	12.20	11.35
	7Y	11.25	11.74	12.00	11.12	10.50	13.92	12.65	11.80
	10Y	11.99	12.53	12.74	11.87	11.24	14.71	13.44	12.58
	20Y	12.02	12.57	12.77	11.90	11.27	14.89	13.59	12.71
	30Y	12.02	12.57	12.77	11.90	11.27	14.89	13.59	12.71
TRY	1M	14.62	16.22	29.76	24.16	17.14	33.01	26.75	19.35
	3M	16.01	16.44	31.15	25.55	18.53	34.33	28.08	20.70
	1Y	24.63	29.87	39.76	34.17	27.15	43.58	37.20	29.74
	2Y	33.25	43.29	48.38	42.79	35.77	52.82	46.32	38.78
	3Y	32.75	42.63	47.88	42.28	35.27	52.29	45.80	38.26
	5Y	31.75	41.32	46.88	41.28	34.27	51.23	44.75	37.22
	7Y	30.74	40.01	45.88	40.28	33.26	50.17	43.70	36.18
	10Y	29.24	38.04	44.38	38.78	31.76	48.58	42.13	34.62
	20Y	29.24	38.04	44.38	38.78	31.76	48.58	42.13	34.62
	30Y	29.24	38.04	44.38	38.78	31.76	48.58	42.13	34.62
RUB	1M	6.75	6.75	4.50	4.00	4.00	8.06	6.83	6.42
	3M	6.75	6.75	4.50	4.00	4.00	8.06	6.83	6.42
	1Y	13.12	10.47	10.87	10.37	10.37	14.43	13.21	12.79
	2Y	12.65	11.35	10.40	9.90	9.90	14.18	12.91	12.47
	3Y	12.05	11.04	9.80	9.30	9.30	13.28	12.07	11.67
	5Y	11.64	11.23	9.39	8.89	8.89	13.27	11.98	11.52
	7Y	11.30	10.98	9.05	8.55	8.55	12.96	11.66	11.21
	10Y	11.26	10.85	9.01	8.51	8.51	12.37	11.18	10.79
	20Y	10.75	10.68	8.50	8.00	8.00	12.31	11.03	10.59
	30Y	10.75	10.68	8.50	8.00	8.00	12.31	11.03	10.59
BRL	1M	12.44	12.44	13.04	8.93	6.29	15.08	10.55	7.68
	3M	12.44	12.44	13.04	8.93	6.29	15.08	10.55	7.68
	1Y	12.60	10.80	13.21	9.09	6.46	15.35	10.80	7.91
	2Y	11.24	8.56	11.84	7.73	5.09	13.98	9.43	6.55
	3Y	10.43	7.62	11.04	6.92	4.29	13.10	8.56	5.69
	5Y	9.68	6.79	10.28	6.17	3.53	12.27	7.75	4.88
	7Y	9.41	6.50	10.02	5.90	3.27	11.97	7.46	4.60
	10Y	9.25	6.34	9.85	5.74	3.10	11.76	7.26	4.40
	20Y	9.30	6.42	9.91	5.79	3.16	11.89	7.37	4.51
	30Y	9.30	6.42	9.91	5.79	3.16	11.89	7.37	4.51

MXN	1M	8.07	10.65	9.90	8.55	7.52	11.90	10.15	8.88
	3M	8.07	10.65	9.90	8.55	7.52	11.90	10.15	8.88
	1Y	8.59	10.15	10.42	9.08	8.05	12.43	10.68	9.41
	2Y	9.11	9.66	10.95	9.60	8.57	12.97	11.21	9.95
	3Y	8.21	8.43	10.05	8.70	7.67	12.11	10.34	9.07
	5Y	7.37	7.36	9.20	7.86	6.83	11.19	9.44	8.18
	7Y	7.08	6.98	8.91	7.56	6.53	10.86	9.12	7.86
	10Y	6.89	6.77	8.72	7.38	6.35	10.64	8.90	7.65
	20Y	6.95	6.88	8.78	7.44	6.41	10.77	9.02	7.76
	30Y	6.95	6.88	8.78	7.44	6.41	10.77	9.02	7.76
CLP	1M	9.36	11.32	10.65	9.20	8.10	12.69	10.83	9.48
	3M	9.36	11.32	10.65	9.20	8.10	12.69	10.83	9.48
	1Y	9.53	9.68	10.82	9.37	8.26	12.96	11.08	9.72
	2Y	8.16	7.45	9.45	8.01	6.90	11.59	9.71	8.35
	3Y	7.35	6.50	8.65	7.20	6.09	10.71	8.84	7.49
	5Y	6.60	5.67	7.89	6.45	5.34	9.88	8.02	6.68
	7Y	6.34	5.38	7.63	6.18	5.07	9.58	7.74	6.40
	10Y	6.17	5.22	7.46	6.01	4.91	9.37	7.54	6.20
	20Y	6.23	5.30	7.52	6.07	4.96	9.50	7.65	6.31
	30Y	6.23	5.30	7.52	6.07	4.96	9.50	7.65	6.31
COP	1M	7.25	11.10	8.35	6.35	4.99	11.17	8.60	6.90
	3M	8.04	11.51	9.15	7.15	5.78	11.16	8.75	7.15
	1Y	9.83	12.07	10.94	8.94	7.57	13.29	10.81	9.17
	2Y	9.49	10.87	10.60	8.60	7.23	13.03	10.53	8.88
	3Y	9.34	10.44	10.45	8.45	7.09	12.93	10.42	8.77
	5Y	9.12	9.93	10.23	8.23	6.87	12.76	10.24	8.58
	7Y	9.04	9.70	10.15	8.15	6.79	12.67	10.16	8.50
	10Y	9.01	9.65	10.12	8.12	6.76	12.61	10.10	8.45
	20Y	9.02	9.54	10.12	8.12	6.76	12.45	9.97	8.34
	30Y	9.02	9.54	10.12	8.12	6.76	12.45	9.97	8.34
JPY	1M	-0.03	-0.06	-0.10	-0.10	-0.10	0.34	0.25	0.20
	3M	-0.03	-0.05	-0.10	-0.10	-0.10	0.35	0.25	0.20
	1Y	0.01	0.07	-0.05	-0.04	-0.03	0.39	0.31	0.27
	2Y	0.06	0.19	-0.04	-0.02	0.00	0.41	0.33	0.30
	3Y	0.10	0.27	-0.04	-0.02	0.00	0.45	0.37	0.33
	5Y	0.17	0.39	0.02	0.06	0.09	0.56	0.48	0.45
	7Y	0.26	0.52	0.02	0.06	0.09	0.61	0.52	0.49
	10Y	0.39	0.69	0.51	0.66	0.84	1.14	1.17	1.27
	20Y	0.77	1.08	0.88	1.04	1.21	1.64	1.64	1.72
	30Y	0.94	1.22	1.06	1.22	1.39	1.90	1.88	1.96
CNY	1M	1.92	2.02	1.92	1.92	1.92	4.08	3.64	3.38
	3M	1.95	2.01	1.95	1.95	1.95	4.20	3.74	3.48
	1Y	2.08	2.22	2.08	2.08	2.08	4.25	3.80	3.55
	2Y	2.20	2.42	2.31	2.31	2.31	4.60	4.13	3.86
	3Y	2.31	2.58	2.54	2.54	2.54	4.95	4.45	4.17
	5Y	2.48	2.78	3.00	3.00	3.00	5.57	5.04	4.74
	7Y	2.55	2.86	3.45	3.45	3.45	6.19	5.63	5.31
	10Y	2.62	2.92	4.14	4.14	4.14	6.86	6.30	5.99
	20Y	2.62	2.92	4.14	4.14	4.14	6.86	6.30	5.99
	30Y	2.62	2.92	4.14	4.14	4.14	6.86	6.30	5.99
INR	1M	4.94	6.33	4.94	4.94	4.94	7.17	6.71	6.45
	3M	5.14	6.44	5.14	5.14	5.14	7.49	7.01	6.74
	1Y	5.85	6.66	5.85	5.85	5.85	8.11	7.65	7.39
	2Y	6.10	6.38	6.10	6.10	6.10	8.41	7.94	7.67
	3Y	6.26	6.30	6.26	6.26	6.26	8.52	8.06	7.79
	5Y	6.44	6.32	6.44	6.44	6.44	8.64	8.19	7.93
	7Y	6.55	6.38	6.55	6.55	6.55	9.06	8.55	8.26
	10Y	6.64	6.42	6.64	6.64	6.64	9.96	9.28	8.90
	20Y	6.64	6.42	6.64	6.64	6.64	9.96	9.28	8.90
	30Y	6.64	6.42	6.64	6.64	6.64	9.96	9.28	8.90
HKD	1M	1.79	5.22	4.65	4.51	3.46	6.41	5.91	4.66
	3M	1.79	5.22	4.65	4.51	3.46	6.41	5.91	4.66
	1Y	2.90	5.00	5.76	5.62	4.57	7.19	6.76	5.54
	2Y	3.13	4.56	6.00	5.86	4.80	7.65	7.17	5.93
	3Y	3.12	4.19	5.99	5.84	4.79	7.76	7.25	5.99
	5Y	3.09	3.92	5.95	5.81	4.76	7.84	7.31	6.04
	7Y	3.07	3.81	5.94	5.80	4.74	7.81	7.29	6.02
	10Y	3.10	3.73	5.96	5.82	4.77	7.84	7.31	6.04
	20Y	3.10	3.73	5.96	5.82	4.77	7.84	7.31	6.04
	30Y	3.10	3.73	5.96	5.82	4.77	7.84	7.31	6.04
ZAR	1M	5.32	7.24	6.06	4.73	3.83	8.18	6.42	5.27
	3M	5.32	7.24	6.06	4.73	3.83	8.18	6.42	5.27
	1Y	6.33	7.70	7.06	5.74	4.84	9.19	7.43	6.28
	2Y	6.90	7.78	7.63	6.31	5.40	9.76	8.00	6.85
	3Y	7.20	7.89	7.93	6.61	5.70	9.88	8.16	7.03
	5Y	7.68	8.22	8.41	7.09	6.18	10.18	8.49	7.38
	7Y	8.15	8.68	8.89	7.56	6.66	10.84	9.12	7.99
	10Y	8.63	9.12	9.36	8.04	7.13	11.30	9.58	8.45
	20Y	8.94	9.32	9.67	8.35	7.44	11.75	10.00	8.85
	30Y	8.94	9.32	9.67	8.35	7.44	11.75	10.00	8.85
RoW	1M	0.74	1.51	3.10	2.64	1.72	4.95	4.11	2.97
	3M	2.22	4.53	4.58	4.13	3.20	6.43	5.59	4.45
	1Y	3.15	5.06	5.52	5.06	4.13	7.36	6.52	5.38
	2Y	3.26	4.59	5.31	4.88	4.05	7.15	6.35	5.31
	3Y	3.17	4.17	5.11	4.71	3.98	7.00	6.22	5.26
	5Y	3.04	3.79	4.70	4.36	3.82	6.65	5.91	5.15
	7Y	2.99	3.65	4.28	4.01	3.67	6.26	5.59	5.01
	10Y	2.99	3.57	3.67	3.49	3.43	5.63	5.05	4.77
	20Y	2.98	3.49	3.67	3.49	3.43	5.51	4.95	4.68
	30Y	2.80	3.24	3.48	3.30	3.25	5.32	4.76	4.49

Notes: The baseline projections for the three-month rates for the euro area are based on market data and ECB staff computations. For the baseline projections of EU, non-EA countries and Norway, the corresponding central banks provided values for the three-month and ten-year swap rates for the purpose of the exercise. The baseline for other countries is based on projections from the October 2022 IMF World Economic Outlook. The "average" starting point rates are computed as the average of 2022. The "latest" starting point rates are computed as the average of December 2022 observations. The baseline forecasts for other maturities are ECB calculations based on market data, and short-term and long-term rates projections. Projections of other maturities, which were missing from market data, are derived using interpolation and extrapolation methods based on the available swap rates projections.

4.2 Detailed risk assessments

4.2.1 ESRB risk assessment

At its meeting on 1 December 2022, the ESRB General Board considered a number of vulnerabilities in the EU financial system, including the following:

- **Prolonged period of low growth and elevated inflation resulting in balance sheet stress in the non-financial corporation and household sectors.** The probability of a recession in the EU significantly increased over the course of the year on account of persistently high inflation, in part driven by the surge in energy prices as well as by the erosion of real disposable household income, tightening financing conditions and prolonged supply chain disruptions. The deterioration in the macroeconomic outlook implies a renewed rise in balance sheet stress for non-financial corporations and households, especially in sectors and Member States that are most affected by rapidly increasing energy prices. This may affect the trajectory of insolvencies and debt sustainability.

- **Sharp asset price corrections and heightened volatility amid low market liquidity and hampered intermediation capacity of non-bank financial institutions.** Financing conditions in the EU tightened in 2022 as prices fell sharply across global bond and stock markets. As well as the significant asset price corrections in the course of the year, further sharp and abrupt asset price corrections are possible should growth prospects deteriorate further, the expected path of monetary policy tightening shift upwards or geopolitical tensions continue to escalate. In the latter months of the year, additional vulnerabilities emerged in the form of lower market liquidity and market concerns about a collateral squeeze. This environment has the potential to impede the intermediation capacity of non-bank financial institutions, which could interact with asset prices and exacerbate their fall.

- **Deteriorating asset quality and profitability prospects interacting with structural vulnerabilities in the banking sector.** Banks in the EU are generally relatively strong in terms of their capital and liquidity positions. They are also benefitting from the ongoing normalisation of interest rates, and their profitability increased to its highest level since 2014. Looking forward, however, several factors are set to weigh on banks' asset quality and profitability: (i) the heightened probability of a recession implies a deterioration in asset quality and a rise in the cost of risk; (ii) the increase in banks' funding costs ceteris paribus will reduce net interest income (NII); and (iii) declining credit demand is likely to encumber lending volumes.

- **Significant price corrections in RRE and CRE markets.** Evidence has strengthened that the real estate cycle in several EU countries is reaching a turning point. RRE prices continued their strong growth in the second quarter of 2022, compounding overvaluation in several EU countries. However, the

sharp rise over the course of the year in lending rates, transaction data and forward-looking household survey responses regarding intentions to build or buy a house suggests that prices may start falling in the near future. Moreover, tightening financing conditions in CRE markets are weighing heavily on profits and have the potential to reverse the post-pandemic recovery in this sector. A stronger correction in CRE markets would induce investor losses, increase the credit risk of bank and non-bank lenders and imply a decline in collateral values.

- **Re-emergence of sovereign financing and debt sustainability concerns.** The deterioration in macroeconomic prospects together with the tightening of financial conditions have led to a further deterioration in medium-term sovereign debt sustainability dynamics.

In addition, the General Board took note of the risks to financial stability which might result from climate change, system-wide cyber incidents and disruptions to critical financial infrastructures, including central counterparties.

4.2.2 EBA Risk Dashboard

The EBA's Risk Dashboard for the third quarter of 2022[8] summarises the main risks to the European banking sector, including the following:

- **The macroeconomic outlook continues to worsen.** The continuing Russian invasion of Ukraine and the subsequent energy crisis, inflationary pressures and monetary policy tightening have affected business and consumer confidence and translated into an expected economic slowdown. For the EU, a recession is expected and may negatively affect credit risk and loan growth, while inflation will increase banks' expenses.

- **Banks currently have sufficient liquidity buffers but face increased wholesale funding costs.** After a quieter period earlier in the year, primary wholesale funding markets were very active again towards the end of 2022, despite volatile market conditions and increasing macroeconomic uncertainty. The recent and upcoming central bank interest rate rises and expectations about the economic trajectory are likely to further increase wholesale funding costs. Going forward, the downward trend in liquidity ratios is expected to continue due to early repayments or maturing ECB targeted longer-term refinancing operations (TLTROs). In a volatile and uncertain market, those banks that require wholesale funding to replace TLTROs or to build up or refinance their minimum requirement for own funds and eligible liabilities buffers are likely to face higher funding costs, especially if they are perceived as more vulnerable. Banks opting to increase their share of deposit funding may also suffer from rising interest expenses due to increasing competition for this source of funding.

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[8]   See **EBA Risk Dashboard Q3 2022**.

- **The asset quality outlook is deteriorating.** High inflation could have a substantial impact on more vulnerable firms and households. The volatility in energy and commodity prices could severely affect energy-intensive sectors. In the event of a recession, debt sustainability concerns could be accentuated.

- **Market risk is elevated due to market volatility and rising rates.** The uncertain macroeconomic outlook has also translated into elevated market volatility, with bouts of heightened volatility throughout the first three quarters of 2022. These capital market trends are not only affecting banks' funding costs but also determining asset prices, hampering banks' profitability. In the latter months of 2022, volatility did recede and bank equity prices recovered some of the decline observed earlier in the year. Debt capital markets recorded rising yields and widening spreads in the first nine months of the year, followed by subsequent contractions. Monetary policy tightening may add to further repricing across asset classes, in particular those with higher risk. Volatility could impair market liquidity and make fair price identification difficult for investors and issuers. Under these conditions, primary market activity may be reduced. Sovereign spreads tightened slightly during the fourth quarter. Nevertheless, with recession fears building up in most EU countries and central banks implementing successive rate hikes, sovereign spreads may widen further.

- **With increasing NII driving profitability, the impact from worsening economic conditions is uncertain.** Return on equity was reported at 7.7% in the third quarter of 2022 (7.9% in Q2 2022), albeit with high dispersion across banks. The main profitability driver was NII, which increased by 2% quarter-on-quarter. Going forward, higher rates could result in a further repricing of assets and liabilities, with further net interest margin (NIM) increases expected. Monetary tightening and an economic slowdown may negatively affect loan growth and therefore act as a counterweight to NIM increases. Rising rates and market volatility could also curb the growth in net fee and commission income observed in previous years as customers switch their investments in riskier products such as mutual or pension funds to safer and less fee-generating ones like term deposits. Operating expenses are likely to increase in the medium term due to the effects of inflation on staff and other administrative expenses. Impairments could increase on the back of a worsening macroeconomic situation.

4.2.3 ECB risk assessment

In its November 2022 Financial Stability Review, the ECB identified the following risks and vulnerabilities to the stability of the euro area financial sector:

- **High inflation and low growth are exposing firm, household and sovereign vulnerabilities.** High inflation and tighter financial conditions are fuelling recession risks. Rising input costs are affecting firms' profitability and sentiment, while the debt servicing capacity of euro area households is being challenged by deteriorating income positions and signs of a turn in the real estate cycle. Sovereign vulnerabilities have increased amid ongoing fiscal support to cushion the impact of higher energy prices and a weaker economic outlook.

- **Volatile financial markets have become more prone to disorderly adjustments.** Despite large corrections in 2022, risky-asset valuations remain sensitive to the uncertain path of inflation, monetary policy normalisation and economic activity. The risk of disorderly adjustments has risen amid increased market volatility and signs of lower market liquidity in some market segments.

- **Bank asset quality concerns are rising amid growing recession risks.** While higher rates support banks' short-term profitability outlook, increased credit risk and higher funding costs may weigh on bank profitability prospects in the medium term. Pre-existing structural weaknesses, together with a greater need to manage cyber risk, remain a challenge for banks too.

- **High credit, duration and liquidity risk in non-banks despite rebalancing.** Non-bank financial institutions (NBFIs) in the euro area have been de-risking, but the credit risk exposure of the sector remains high. In a context of rising bond yields, NBFIs' duration risk remains elevated, exposing the sector to further bond portfolio revaluation losses. The liquid asset holdings of investment funds remain low, which could amplify a market correction via procyclical selling behaviour.

4.3 Methodological note on the sectoral decomposition of real gross value added

As a new feature for the 2023 EU-wide stress test, the scenario features a decomposition of the GDP impact across different sectors of the economy. To this end, the economy is decomposed into 16 sectors, corresponding broadly to the first level of the NACE2 decomposition, but with bespoke adjustments to reflect crucial banking subsectors as well as the central elements of the scenario narrative – notably with regard to the decomposition of the manufacturing subsectors along their exposure to energy prices. The 16 sectors are detailed in Table A1.

Table A1 Sectoral decomposition	
NACE2 sections	Description
A	Agriculture, forestry and fishing
B	Mining and quarrying
C (a)	Manufacturing – low energy intensity
C (b)	Manufacturing – high energy intensity
D	Energy
E	Utilities
F	Construction
G	Wholesale and retail trade
H	Transportation and storage
I	Accommodation and food service activities
J	Information and communication
K	Financial and insurance activities
L	Real estate activities
M, N	Professional, scientific, technical, administration and support service activities
O, P, Q	Public administration, defence, education, human health and social work activities
R, S, T, U	Arts, entertainment and other services

Sources: Eurostat and ECB staff.

The sectoral decomposition is based on a top-down approach, breaking down the aggregate impact of each shock into sectoral impacts. To understand the sectoral decomposition, it should first be noted that the impact of the stress test scenario is computed as the sum of the impacts of different orthogonal shocks (for example, shocks on foreign demand, on households' confidence and on oil prices). For instance, the 2023 EU-wide stress test scenario uses 15 different shocks summarised in the leftmost column of Table A2. The impact on key endogenous variables (such as GDP) is obtained by summing the contribution of each shock to the endogenous variable of interest. For the sectoral decomposition, each individual contribution is broken down into 16 sectoral impacts using sectoral vulnerabilities that reflect the sensitivity of each sector to this shock. These vulnerabilities can vary across jurisdictions and time: Table A2 pairs each shock with its corresponding specific vulnerability as entailed in the EBA 2023 exercise. Each vulnerability can be interpreted as a multiplier expressing the relative vulnerability across sectors of the same country: the impact of a shock i on a sector j in country c is the aggregate impact of this shock i on country c multiplied by the vulnerability. If, for instance, the impact of a foreign demand shock on German GDP is -1.5 percentage points and the vulnerability of sector B "mining and quarrying" in Germany to a foreign demand shock is 2, then the sectoral impact of such a shock on mining and quarrying in Germany will be 3 percentage points (1.5 multiplied by 2). By repeating this exercise for all 15 shocks and then summing the results, the sectoral impacts are obtained.[9]

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[9] In the sectoral analysis and for the purpose of simplification, it is always assumed that the sum of the sectoral real gross value added is equal to the aggregate real GDP.

Table A2 Computation of vulnerabilities

Shock	Name of vulnerability / formula for exposure	Data sources
House prices	Model-based (cross-sector VAR)	Eurostat
Short-term interest rates	Model-based (cross-sector VAR)	Eurostat
Long-term interest rates	Model-based (cross-sector VAR)	Eurostat
User cost of capital[1]	Current debt sustainability = **total loans** over value added	ECB BSI and OECD TiVA 2021
Foreign demand	Export openness = value added content of **exports** over value added	OECD TiVA 2021
Foreign prices	Import openness = value added content of **imports** over value added	OECD TiVA 2021
Exchange rates		
Equity prices	Current capital intensity = ratio of **capital inputs** over inputs	OECD TiVA 2021
Households' nominal wealth	Exposure to private consumption = ratio of output used (directly and indirectly) for **households' final consumption expenditure** over output	OECD TiVA 2021
Households' confidence		
Business confidence	Exposure to business investment = ratio of output used (directly and indirectly) for **gross fixed capital formation** over output	OECD TiVA 2021
Oil prices	Oil intensity = ratio of inputs (direct and indirect) from the **oil sector** (C19) over output	OECD TiVA 2021
Food prices	Model-based (cross-sector VAR)	Eurostat
Wages	Labour intensity = ratio of **labour inputs** over inputs	OECD TiVA 2021
Gas supply cuts	Energy intensity = ratio of inputs (direct and indirect) from the **energy-related sectors** (B5, B6, C19, D35) over output	OECD TiVA 2021

Source: ECB staff.

In practice, sectoral vulnerabilities are computed following a three-step approach. The methodology ensures that (i) vulnerabilities are based on economic rationale and historical data; (ii) sectoral impacts are consistent with the aggregate impact; and (iii) cross-country heterogeneities are limited. The detailed methodology is the following:

- **The exposure of each sector to the shocks is determined empirically based on sectoral data, using, in most cases, explicit statistics, and in some cases, a multi-sector model.** The middle column of Table A2 indicates how each vulnerability is computed. For nine out of 13 vulnerabilities, they

are computed as a formula based on economic rationale.[10] For the remaining four vulnerabilities, a modelling approach is undertaken where vulnerabilities are based on a cross-sector model using historical data linking sectoral value added (as a dependent variable) to metrics for the shock and control variables (as independent variables).

- **To ensure consistency between the sectoral impacts and the aggregate impact, exposures are scaled.** It should be recalled first that the sectoral decomposition follows a top-down approach in which the aggregate impact is computed first and then decomposed into sectoral impacts. By the same token, the sum of the sectoral impacts should therefore equal the aggregate GDP impact following a pseudo-accounting equation. Scaling fulfils such a requirement, as the formulas (and model) listed in Table A2 will not by themselves ensure that such a condition is met. In practice, this is performed by ensuring that for each shock and each country, the sum of sectoral vulnerabilities, weighted by the share of each sector in total value added, is equal to 1. This implies that for each shock, the sum of sectoral impacts will equal the aggregate impact. It should be noted that the scaling maintains the relative exposures across sectors. For example, if sector D was found to be five times more exposed than sector E to a shock, then the vulnerability of sector D will still be five times higher than the vulnerability of sector E.

- **Finally, vulnerabilities undergo an outlier correction in order to contain the level of heterogeneities across countries.** Outlier correction is performed for a given shock and a given sector, meaning only the country dimension is considered. The purpose is to achieve a higher homogeneity of vulnerabilities across countries. The detection of outliers is based on the distance to the median value and the interquartile range (IQR, spread between the 25th and 75th percentiles). Any value found to be outside of the median plus/minus 1.5 IQR is deemed an outlier. Detected outliers are then adjusted following an iterative process. The farthest outlier is first corrected by setting its new value at the boundary of the outlier detection interval (median plus/minus 1.5 IQR). Then, in-between outliers are adjusted in such a way that the proportion of distances between the first non-outlier value and the farthest outlier remain identical before and after adjustment.

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[10]   For example, the exposure to a shock on oil prices is computed as the share of oil inputs in the total inputs used by the sector. To comply with the imperatives of transparency and simplicity, a large majority of these statistics-based vulnerabilities use the OECD TiVA input-output tables, a publicly available and widely used dataset.