Results of the 2017 low-interest-rate survey

Press conference on 30 August 2017

2017 low-interest-rate survey

- Bundesbank and BaFin surveyed 1,555 German credit institutions between April and June this year on their profitability and resilience in the low-interest-rate environment.
- Complete survey of all small and medium-sized banks and savings banks; significant institutions under direct ECB supervision excluded.
- Survey covered around 88% of all credit institutions in Germany, and roughly 41% of total assets.
- Already the third time this survey has been carried out, following 2013 and 2015.
- Exclusive perspective of current and future risk situation of German banks and savings banks based on their planning assumptions as well as stress scenarios predefined by supervisors.

2017 survey illuminates risk in low-interest-rate environment

Part 1: Insight into earnings projections of German credit institutions

- Focus on profitability based on institutions' plans until 2021.
- Augmented by prudential interest rate scenarios.

Part 2: Stress tests exploring institutional resilience

- Basis for determining an institution's individual capital buffer.
- Assumption of adverse market developments: simulated hike in interest rates, impairments and market losses.

Part 3: Analysis of further potential risk factors in the low-interest-rate environment

- Risk inherent in residential mortgage loans.
- State of play for building and loan associations.
- Easing of lending standards.

Scenarios and methodological standards of the low-interest-rate survey

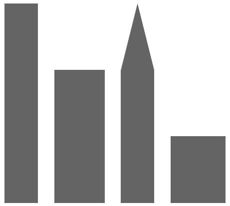
2017 low-interest-rate survey			
Survey	**Interest rate scenarios** (balance sheet assumption[1]) *New* "Inverse turn" scenario	▪ Planning ▪ +/-0 bp ▪ +200 bp ▪ -100 bp ▪ -100 bp ▪ +200 bp to -60 bp	(dynamic) (static) (static) (static) (dynamic) (static)
SREP stress tests	Interest rate risk	▪ Baseline: constant yield curve ▪ Stress: +200 bp interest rate shock	
	Credit risk	▪ Probability of default: +155% ▪ Loss given default: +20%	
	Market risk	▪ Interest-bearing items: +30 bp to +1,500 bp risk premium ▪ Other positions: 20% haircut *New* Uniform haircut	
Quality assurance		▪ Cross-check with reporting data ▪ Peer group comparisons	

[1] Static balance sheet assumption: maturing business replaced by equivalent new business at prevailing standards. Dynamic balance sheet assumption: no prudential constraints on balance sheet structure.

Key survey takeaways at a glance

- Banks and savings banks in Germany planning for a 9% drop in their pre-tax profit for the financial year and a 16% decline in their return on assets between 2016 and 2021.
- In the same period, the aggregate common equity tier 1 (CET1) capital ratio of all institutions is expected to rise from 15.9% to 16.5%.
- Scenarios with additional interest rate reductions would reduce the pre-tax return on assets by as much as 60%. Impact less pronounced than in the 2015 survey.
- Accounting for stress conditions and hidden reserves, around 4.5% of institutions would fall short of the prudential requirements (pillars I & II plus the capital conservation buffer).
- Just over 70% of institutions expect to see mounting competitive pressure in the sector from other banks and, for more than 80% of them, from FinTechs.
- Nearly one in two institutions can envisage a merger in the medium term, and just over 10% already have concrete intentions.
- Unsecured portion of loans for house purchase rise slightly at roughly one-third of institutions, but no worrying easing of credit standards.
- Simulated extreme drop in housing prices in Germany would shave just one percentage point, or thereabouts, off institutions' CET1 capital ratio.

Low-interest-rate survey looks five years into the future



1,555 small and medium-sized banks and savings banks

Survey

P&L forecasts

Forecast of supervisory figures

Qualitative questions

Credit risk

Market risk

Interest rate risk

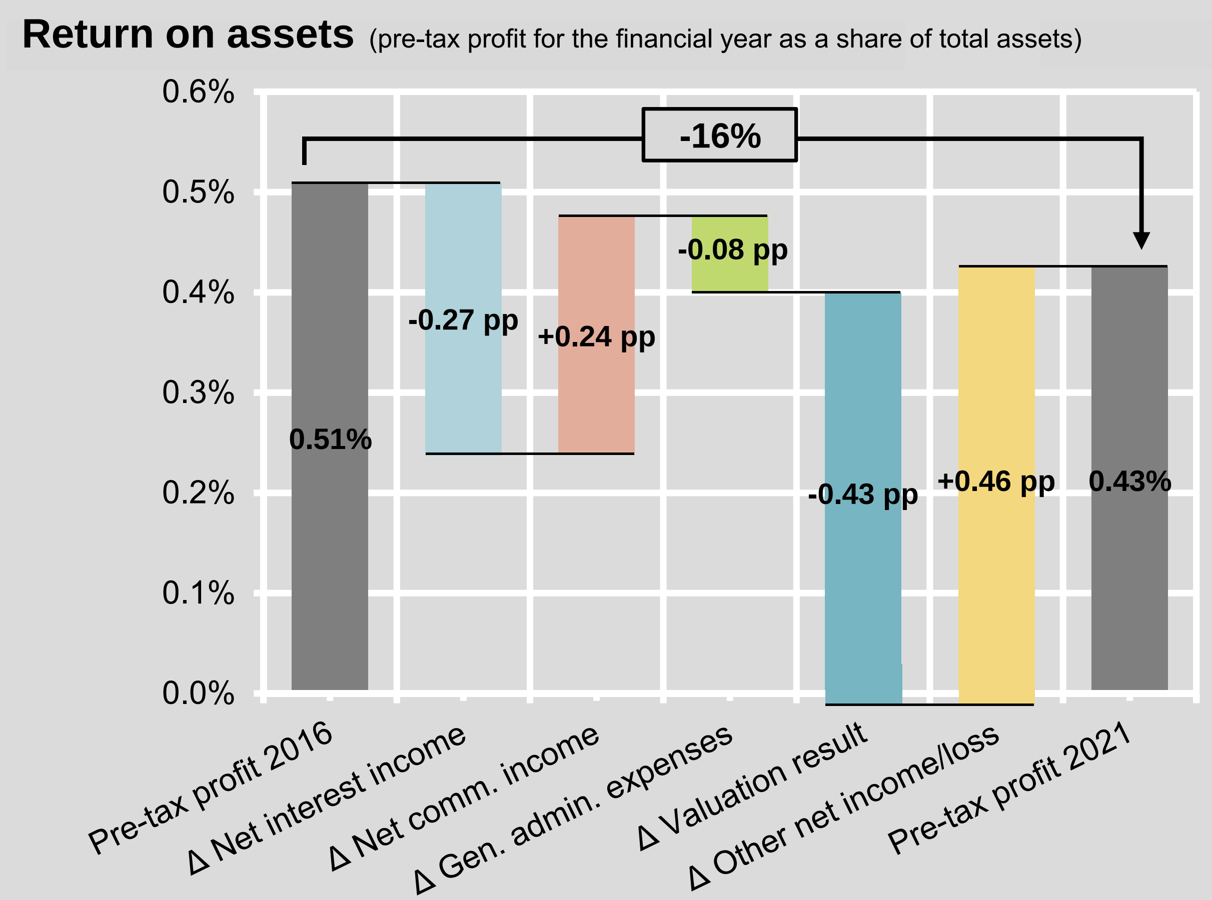
Residential real estate

Building and loan associations

Credit standards

Institutions expecting to experience falling net interest income, higher impairments and a drop in return on assets until 2021

Projected pre-tax profit for the financial year



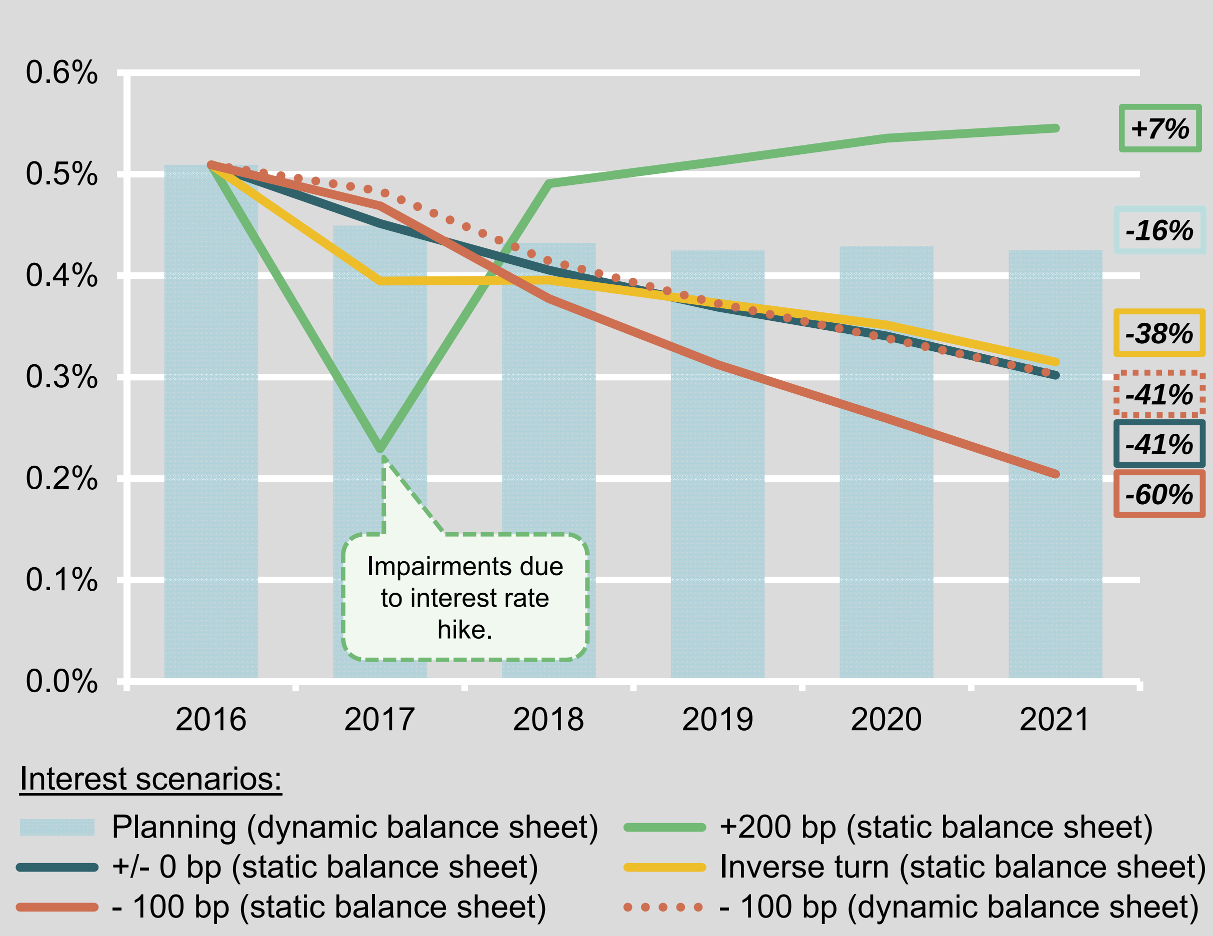
Note: 1 pp roughly equates to €12bn.
Source: *2017 low-interest-rate survey.*

- Pre-tax return on assets expected to drop by 16% by 2021 (2015: 25%).
  - Profit for the financial year drops by 9%
  - Total assets climb by 10%
- Decline mainly propelled by negative impact of impairments in lending business.
- Lower net interest income (-0.27 pp) largely offset by stronger net fee and commission income (+0.24 pp).
- Allocations to the fund for general banking risks pursuant to section 340g HGB to decline, thus limiting the drop in pre-tax profit for the financial year to €1.0bn.

Earnings impact smaller than in 2015 survey

Return on assets

Pre-tax profit for the financial year as a share of total assets

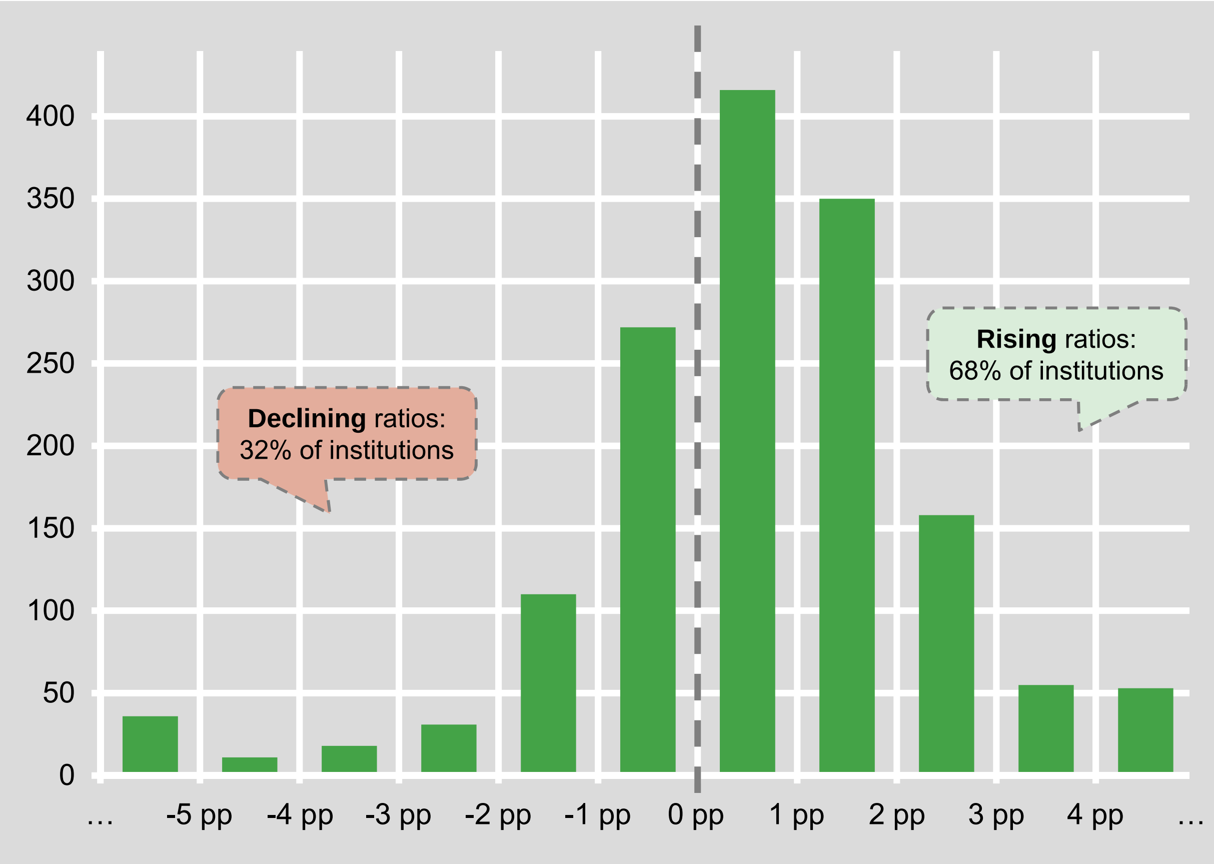


Source: *2017 low-interest-rate survey.*

- In the short term, institutions vulnerable to an abrupt interest rate hike (+200 bp); in the medium term, this scenario will see an increase in the total return on capital.
- Protracted low-interest-rate environment (+/- 0 bp) and inverse turn in the yield curve would have similar impact on earnings (drop by roughly 40%).
- Scenarios simulating additional interest rate reductions will depress profit for the financial year before tax by as much as 60%.
- Balance sheet policy offers scope to improve earnings.

Increased risk taking weakens build-up of capital ratios

CET 1 capital ratio
Number of banks, change between 2016 and 2021

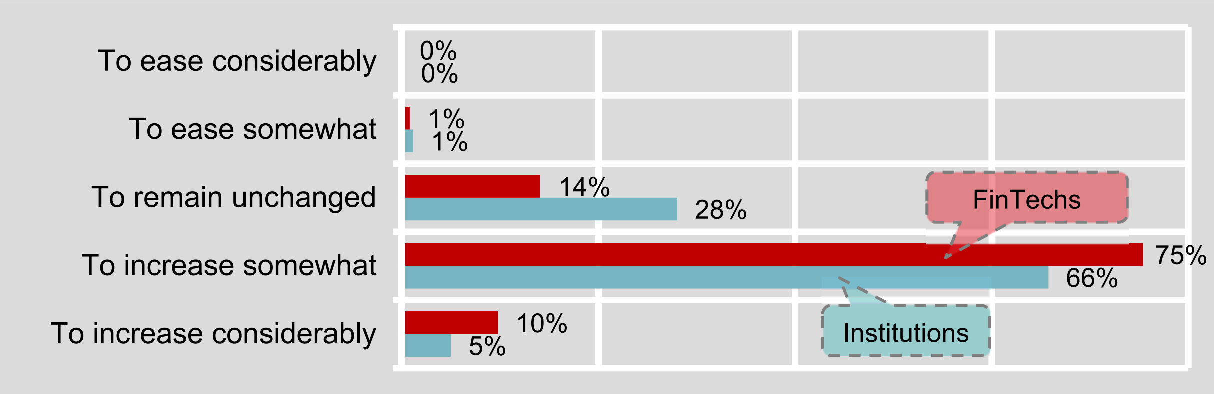


Source: *2017 low-interest-rate survey.*

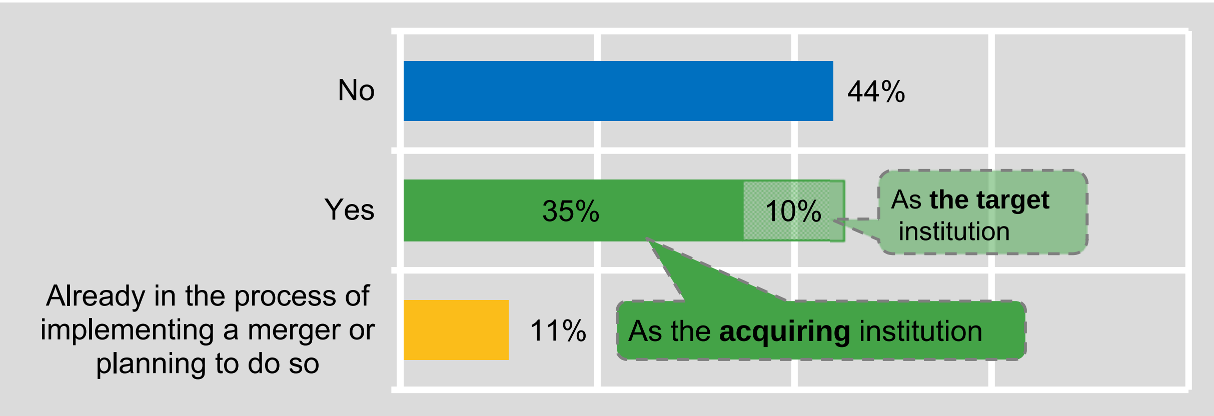
- Institutions plan an increase in CET1 capital ratio (15.9% to 16.5%).
  - But for one in three institutions, that ratio will drop.
- Main reasons for decline in CET1 capital ratio:
  - Rise in risk-weighted assets.
  - Rise in risk-weighted assets as a share of total assets.

Around one in two institutions can envisage a merger

In future, do you expect competition with other FinTechs or banks …



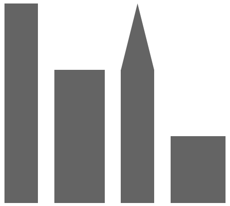
Can you generally envisage a situation where you merge with another institution in the next five years?



Source: *2017 low-interest-rate survey.*

- Looking ahead, 71% of institutions expect to see mounting competitive pressure from other banks, and for as many as 85% of them, from FinTechs.
- Nearly one in two institutions can envisage a merger in the next five years.
  - → Consolidation expected in the banking sector.
  - → Mergers and acquisitions lose their stigma.
- That said: more institutions are prepared to take over another institution than be taken over themselves.
  - → Number of actual mergers will certainly be smaller.

The stress test addresses the key risks in banking business



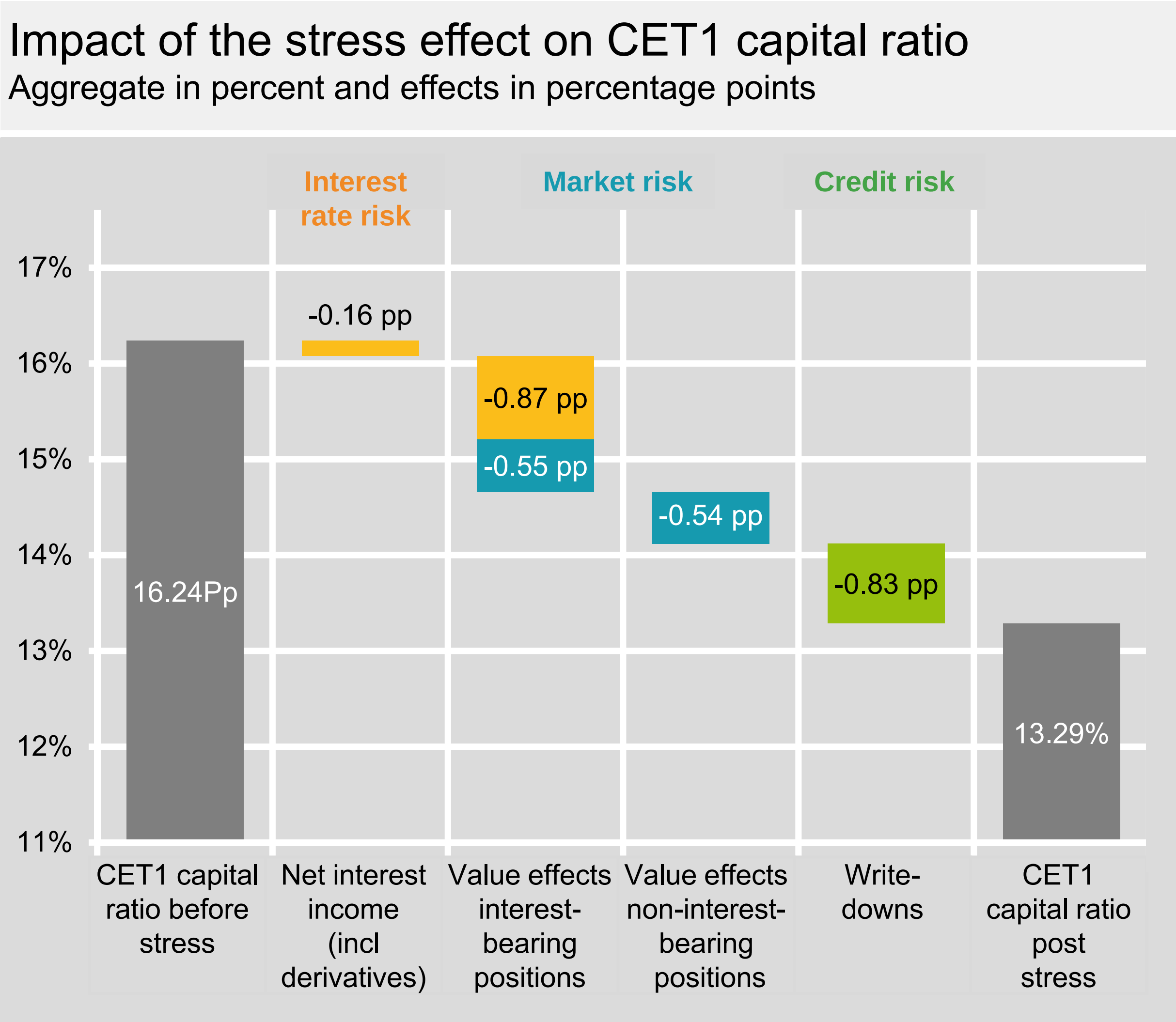
1,555 small and medium-sized banks and savings banks

	P&L forecasts	Forecast of supervisory figures	Qualitative questions
Stress test	Credit risk	Market risk	Interest rate risk
Other	Residential real estate	Building and loan associations	Credit standards

Stress test: basis for determining target equity ratio

	Capital requirements	Level	If not met
Pillar II guidance	Capital add-on as early-warning threshold	Supervisory LSI stress test as basis for decision	Increased intensity of supervision
Capital conserva-tion buffer	Capital add-on as stress buffer	CET 1 capital ratio: **1.25%** (for 2017, incremental increase up until 2019)	Capital conservation plan and, if nec, ban on distributions (section 10i Banking Act)
+ Pillar II requirements	Capital add-on for risks not covered by Pillar I (section 10 (3) Banking Act), such as: ▪ interest rate risk in the banking book ▪ credit spread risks ▪ real-estate price risks	Total capital ratio: **1.49%** (average 2016 for 303 banks with SREP notice)	Non-exhaustive catalogue of measures (section 45 of the Banking Act)
+ Pillar I requirements	Capital add-on for ▪ credit risk ▪ market risk ▪ operational risk	CET 1 capital ratio: **4.50%** Tier 1 capital ratio **6.00%** Total capital ratio: **8.00%**	

Stress test: German institutions mostly well capitalised



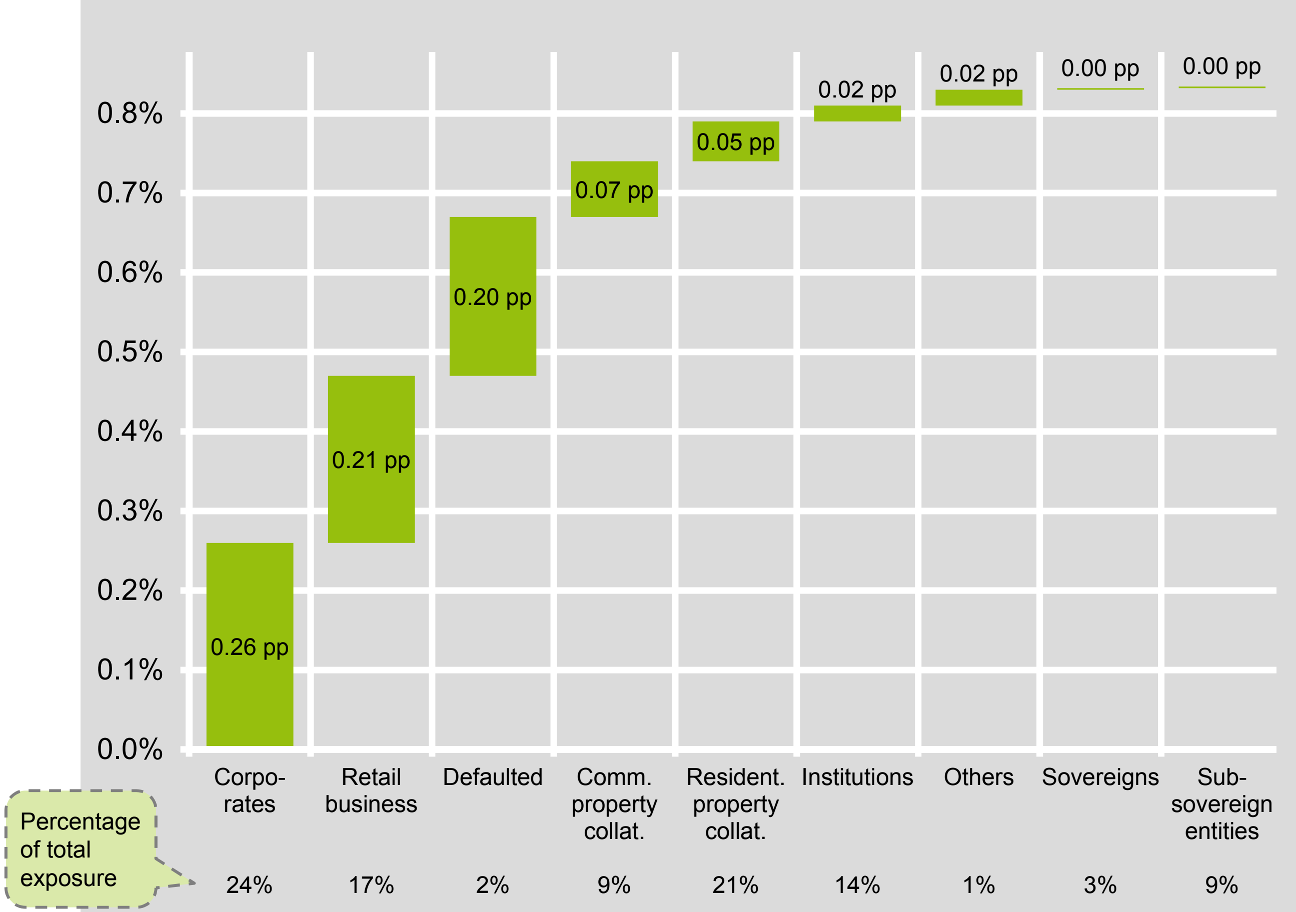
Source: *2017 low-interest-rate survey.*

- The stress test has shown that German institutions are mostly well capitalised in each of the stress scenarios.
- CET1 capital ratio drops by 2.95 percentage points in aggregate in one-year stress horizon (16.24% to 13.29%).
- Main drivers are value effects on interest-bearing positions as a result of interest rate increases.
- Additionally: hidden reserves may serve as another capital buffer for some institutions.
- Taking hidden reserves into account, roughly 4.5% of institutions would fail to meet supervisory requirements (Pillars I & II plus capital conservation buffer) in a stress event.

Credit risk stress test: corporate and small loans responsible for 56% of stress effect

Stress effect by exposure class

Aggregate in percentage points

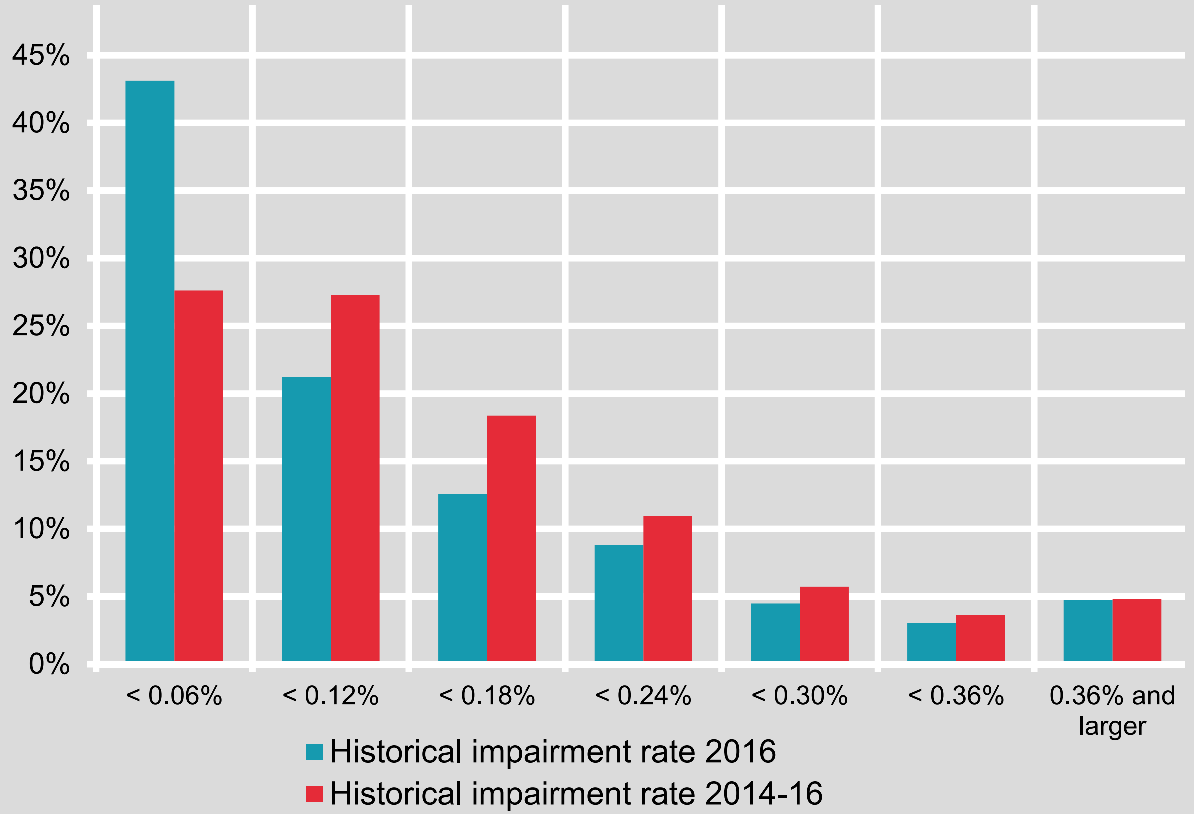


Source: *2017 low-interest-rate survey.*

- In the credit risk stress test, the CET1 capital ratio falls by 0.83 percentage point.
- The greatest losses are caused by impairments on corporate loans, small loans and defaulted exposures.
- Corporate loans and loans backed by residential property make up similarly high percentages of the portfolio. Nonetheless, the latter result in significantly lower impairments as collateralisation ratios are higher.

Credit risk stress test: impairment rate benefits from overall economic developments

Comparison impairment rates* 2016 with 2014-16
Number of credit institutions in %

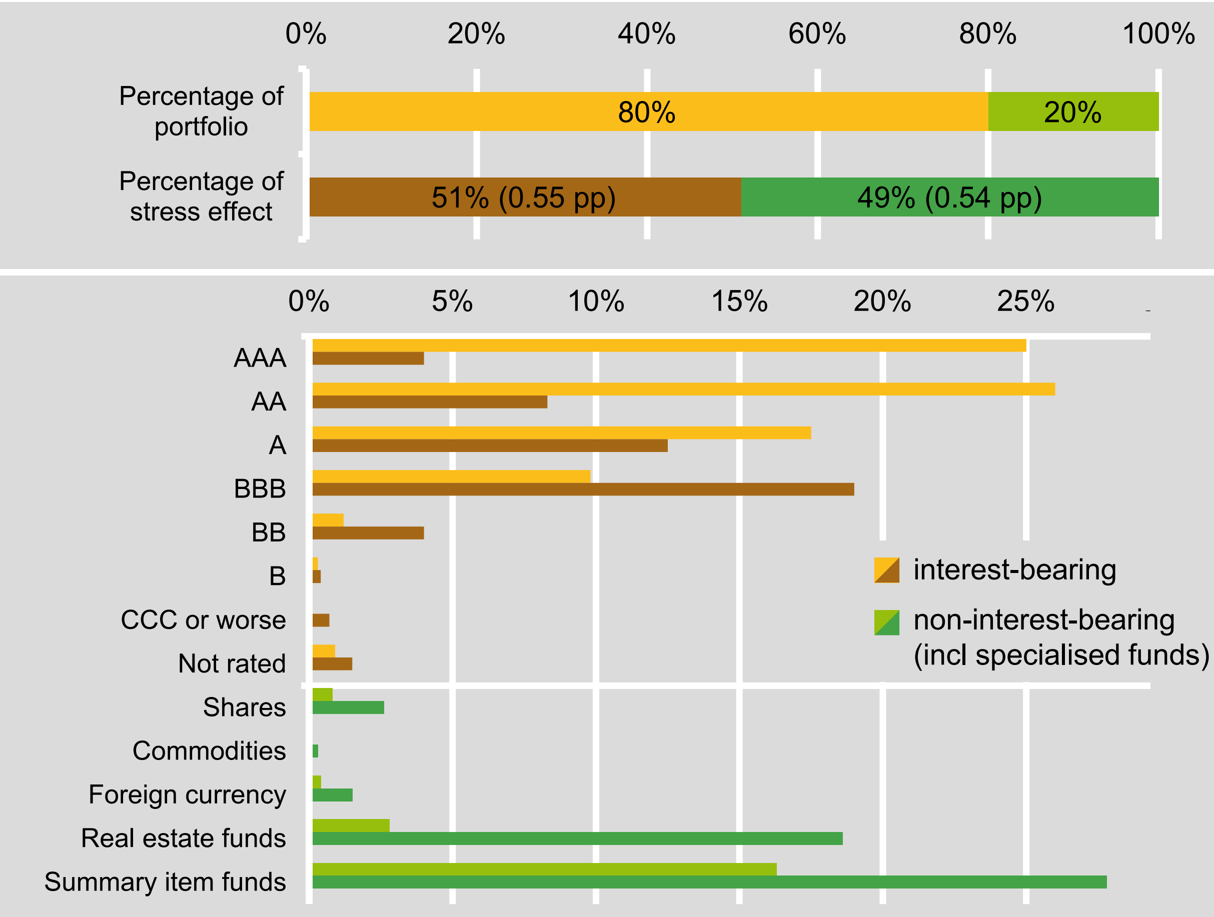


* Impairment rate = impairments/risk volume
Source: *2017 low-interest-rate survey.*

- The impairment rate observed for German institutions fell further. This is largely due to the good overall economic developments.
- In aggregate, the average impairment rate was 0.25% in 2016.
- Compared with the average for 2014-16 (0.28%), the decline is 0.03 percentage point.

Market risk stress test: same stress effect from interest-bearing and non-interest-bearing exposures

Percentages in total exposure and in stress effect
Aggregate in %

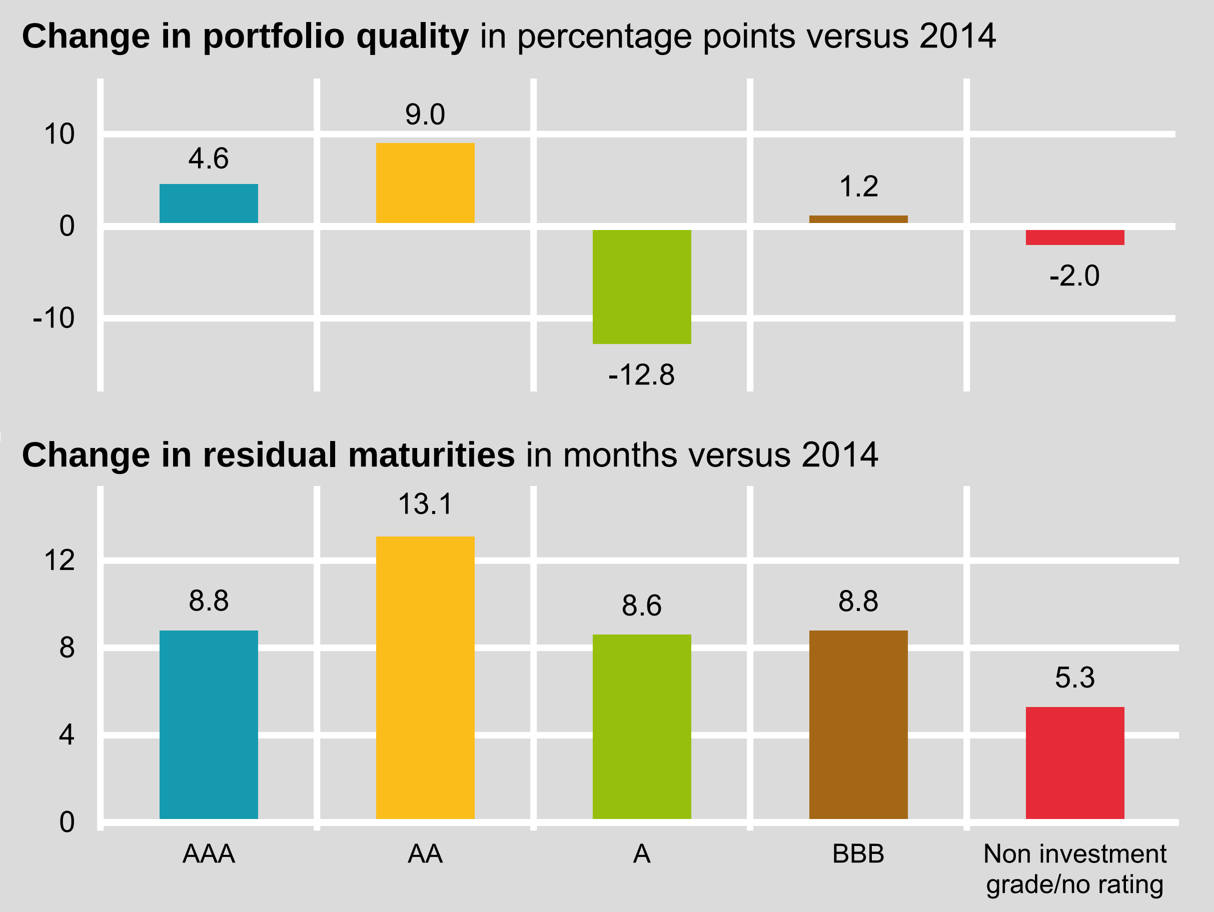


Source: *2017 low-interest-rate survey.*

- In the market risk stress test, the CET1 capital ratio falls by 1.09 percentage point.
- Half of the stress effect is caused by open interest-bearing positions.
- Non-interest-bearing positions were included for the first time. They make a disproportionately large contribution to the stress effect.
- Among interest-bearing positions, the credit quality category BBB has the largest stress effect.
- Shares, commodities and foreign currency make up a negligible percentage of the portfolio and of the stress effect.

Market risk stress test: improved portfolio quality for longer residual maturities

Change in portfolio quality and residual maturities
Aggregate

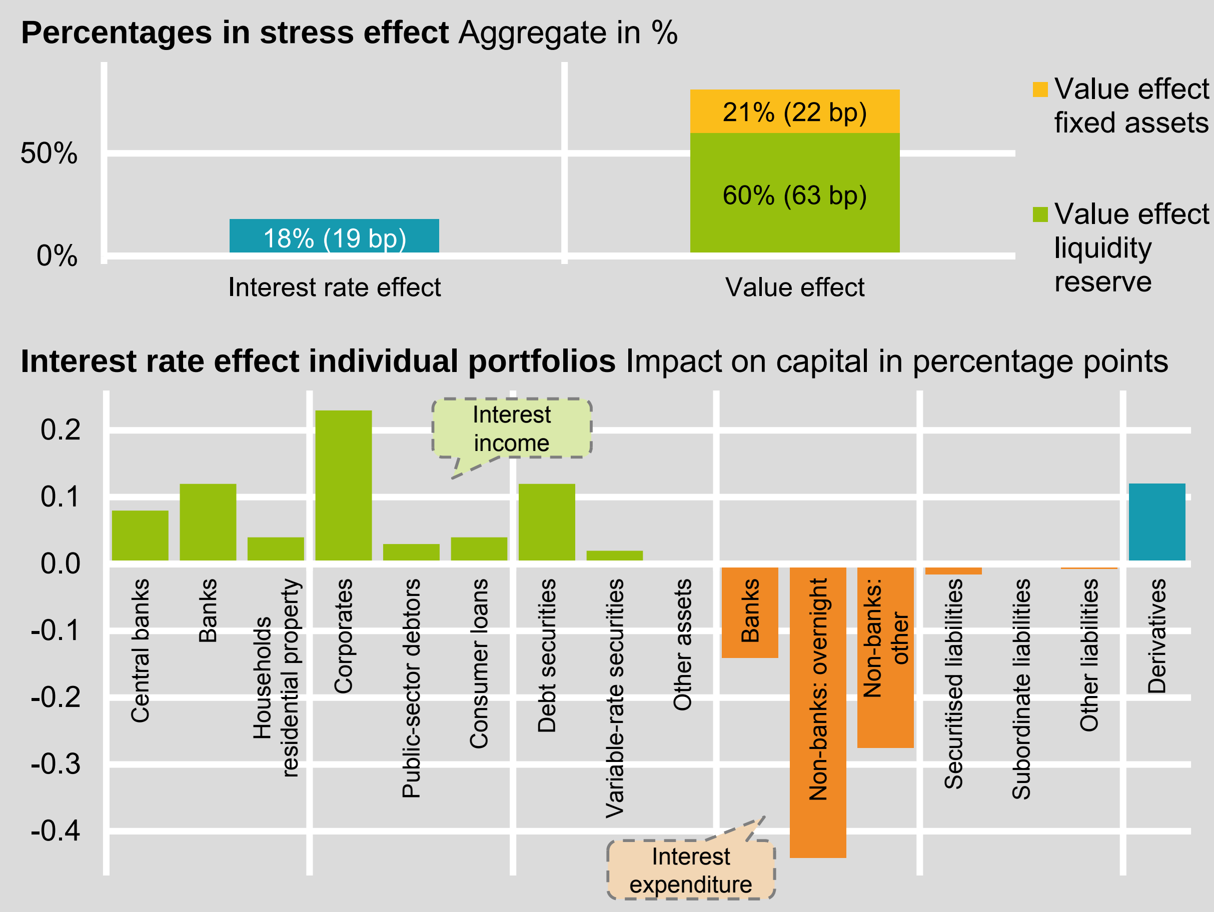


Source: *2017 low-interest-rate survey.*

- For assets in the liquidity reserve and held for trading, the percentage of paper rated AA and AAA has increased signficantly versus 2014.
- The increase is made at the expense of securities rated A, in particular.
- Non-investment-grade securities were reduced slightly.
- By contrast, residual maturities were extended by an average of just under nine months in all rating categories.

Interest rate risk stress test: impairments would weigh on earnings in positive interest-rate shock

Percentages in stress effect and interest effect
Aggregate



Source: *2017 low-interest-rate survey.*

- In the interest rate risk stress test, the CET1 capital ratio falls by 1.03 percentage point.
- Roughly 80% of the stress effect is driven by valuation effects.
- The valuation effects are largely the result of securities in the liquidity reserve. By contrast, value effects of trading assets are of subordinate importance.
- In the event of a +200bp interest rate shock as compared with the constant scenario, net interest income is hurt, in particular, by overnight liabilities on non-banks. Claims on enterprises, by contrast, boost net interest income significantly.

Price risks on residential property market rising, but no bubble yet in Germany

1,555 small and medium-sized banks and savings banks

P&L forecasts

Forecast of supervisory figures

Qualitative questions

Credit risk

Market risk

Interest rate risk

Other risks

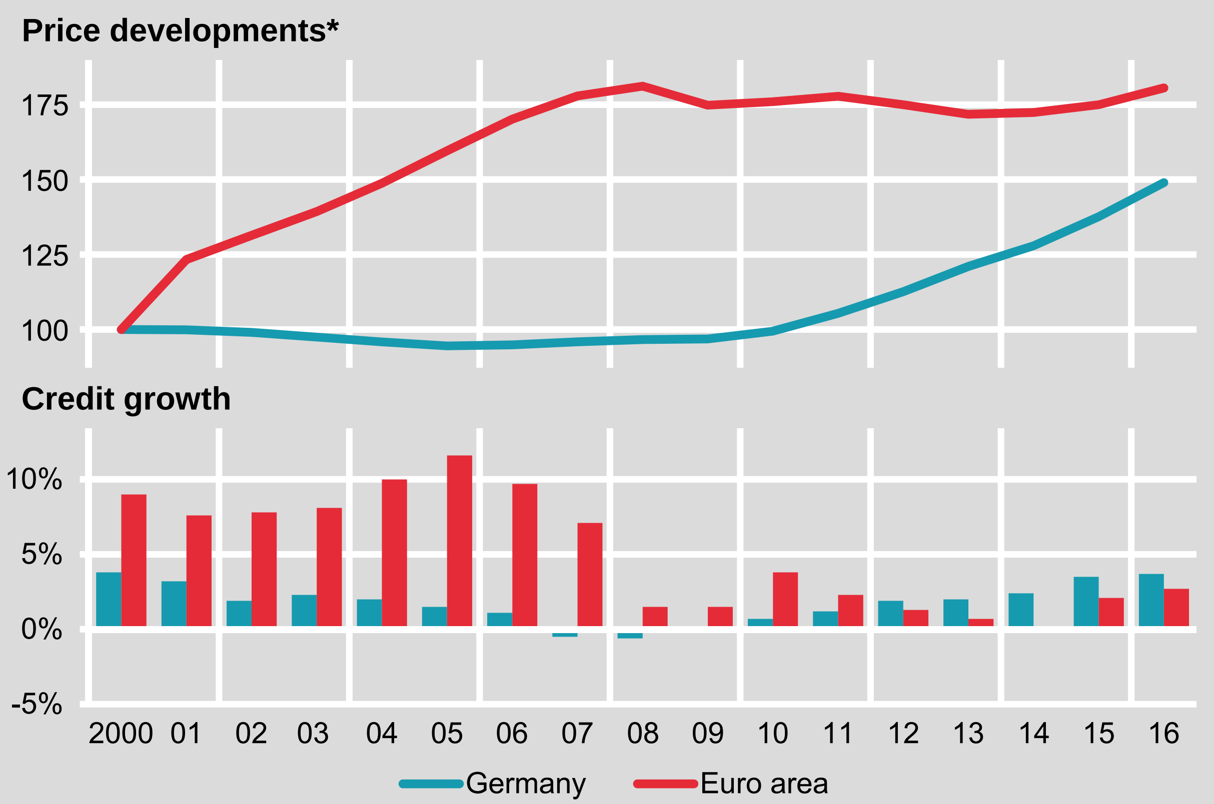
Residential real estate

Building and loan associations

Credit standards

Situation in the German residential property sector: price/credit growth

Price developments and credit growth
Aggregate



* Index 2000=100; in Germany: price developments for 127 towns and cities.

Sources: Deutsche Bundesbank Monthly balance sheet statistics, Bundesbank calculations based on price data provided by bulwiengesa AG, ECB Balance Sheet Items, ECB Residential Property Price Indicators.

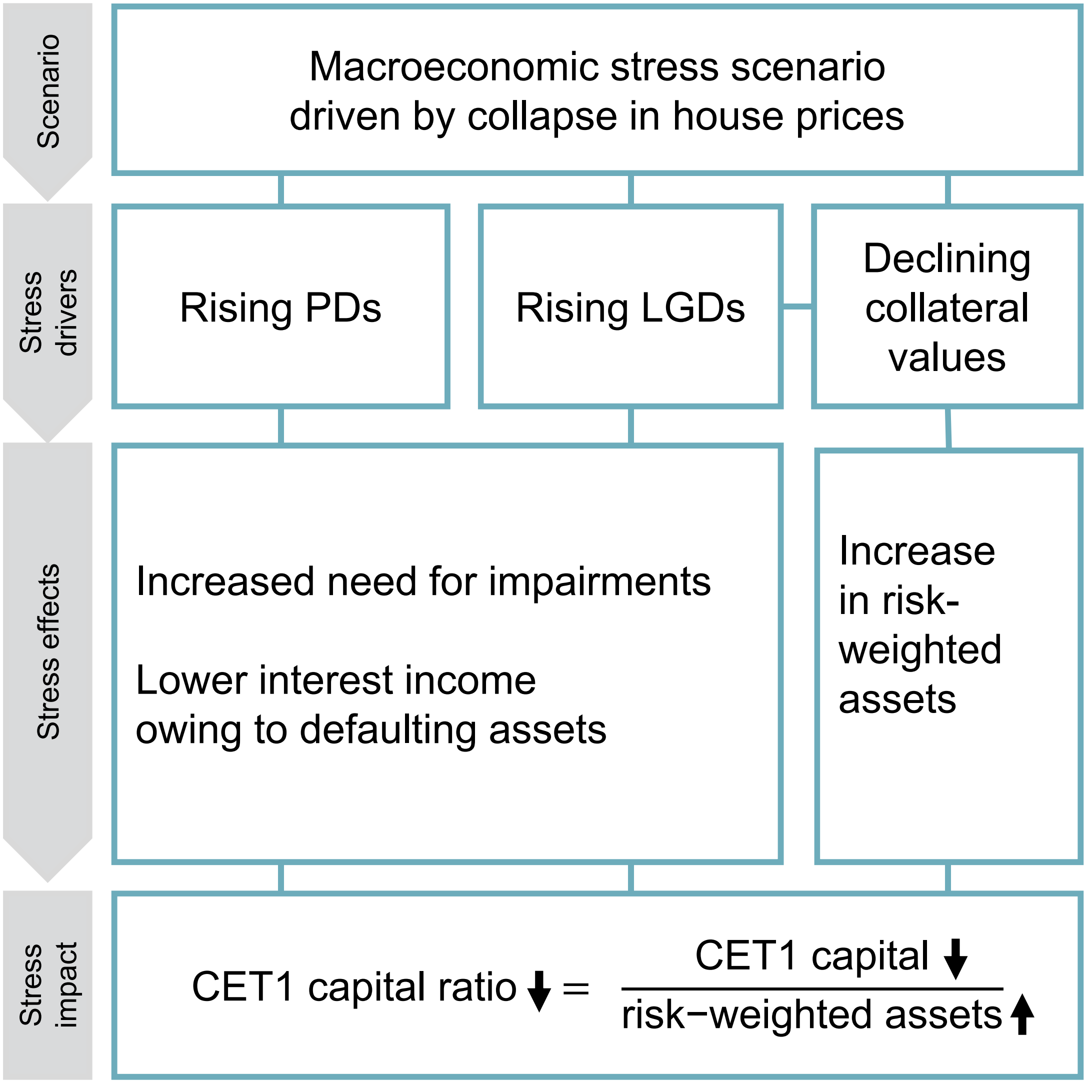
- Sharp price increase of around 50% since 2010 is contributing to estimated overvaluation of 15-30% in German towns and cities.
- Growth rates for housing loans have been rising continuously, but moderately, since 2010.
- Credit growth at the current end more pronounced for small and medium-sized institutions, at around 5%, than in the market as a whole.

Slight, harmless increases in risk propensity in financing house purchases in Germany

		2014		2016
	Ø Exposure (in €1000s)	92	↗	110
Credit conditions*	**Interest lock-in** (in years)	7.9	↗	8.9
	Capital lock-in (in years)	22.6	→	23
	Repay ratio (%)	3.6	→	3.8
	Interest rate (%)	2.4	↓	1.7
Collateral	▪ 36% of institutions state that the sustainable LTV ratios have increased on the year (only 3% report a fall).			
Credit quality	▪ No signs of a deterioration in borrowers' credit quality.			

* Credit conditions as volume-weighted mean values of new business in 2014 and 2016 respectively.
Source: *Low-interest-rate survey 2017.*

Top-down stress test on residential mortgage loans

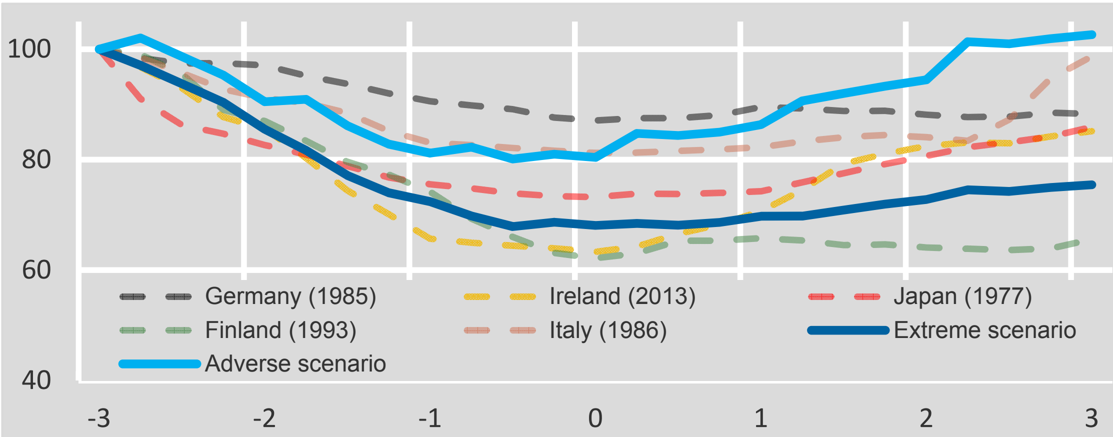


- Modelling a macroeconomic environment that matches the hypothetical fall in house prices
- Scenarios used to derive stressed risk parameters for loans for house purchase.
- Stressed risk parameters cause deterioration in institutions’ profit and loss account.
- Regulatory capital requirements (standard approach) increase as a result of decline in collateral values.
- Both effects reduce institutions’ CET1 capital ratio relative to their own planning.

Stress test on residential mortgage loans: institutions vulnerable, but armed

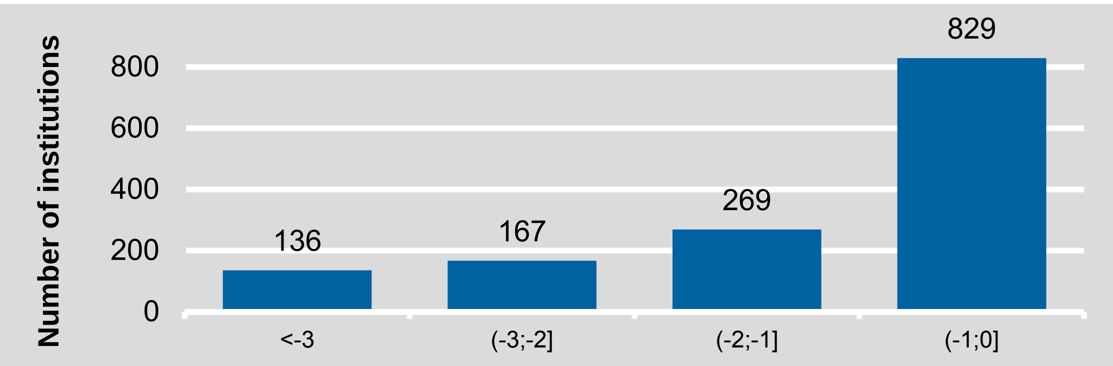
House price scenarios in a cross-year comparison

3 years before low = 100



Change in CET1 capital ratio

Extreme scenario, change in pp for individual institutions



Source: OECD, *Low-interest-rate survey 2017.*

- Scenarios based on extreme and adverse house price adjustments in DE: -30% / -20%.
- The price shock would lead to losses at some banks:
  - Decline in CET1 capital ratio in the aggregate in the extreme (adverse) scenario by 0.9 pp (0.5 pp).
- Around €12 billion (€5.6 billion) would be needed to rebuild CET1 capital ratio prior to stress.
- Taking account of contagion effects would significantly intensify effects.

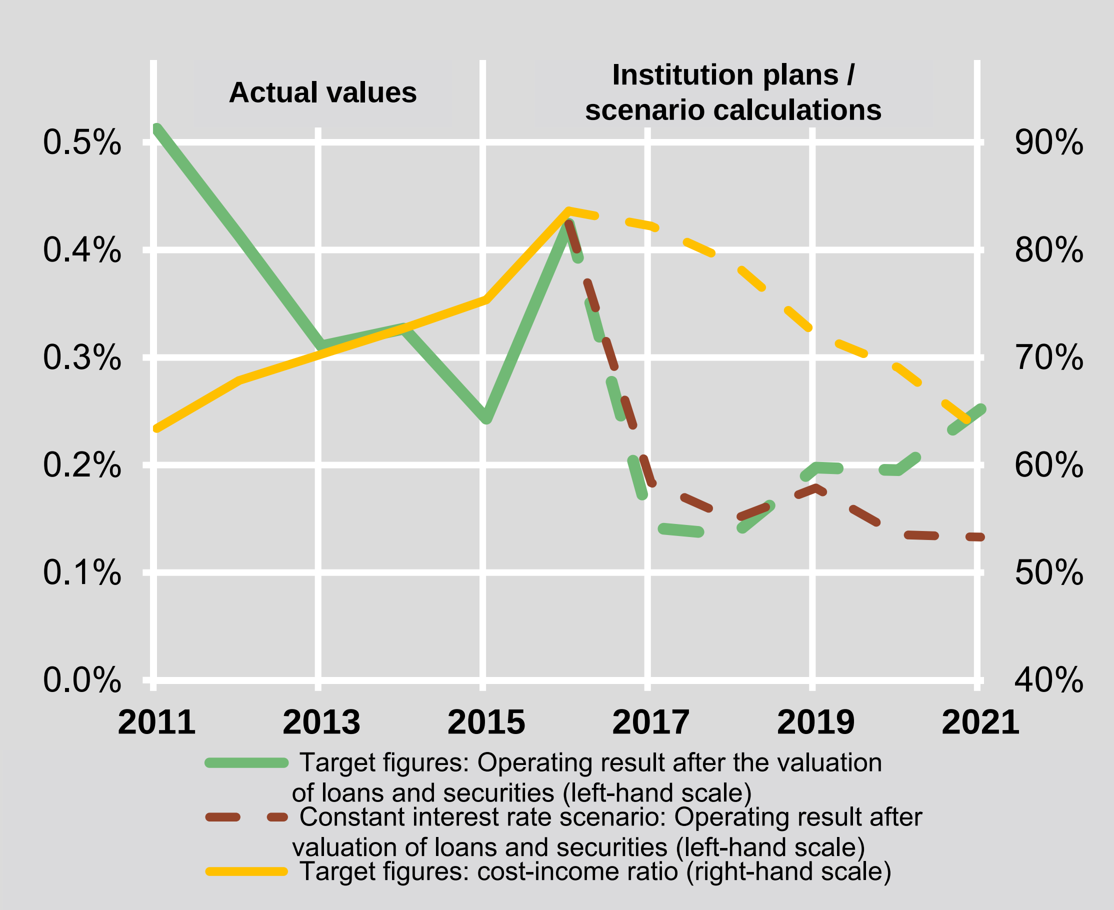
A separate survey was conducted for building and loan associations

1,555 small and medium-sized banks and savings banks

Survey	P&L forecasts	Forecast of supervisory figures	Qualitative questions
Stress test	Credit risk	Market risk	Interest rate risk
Other risks	**Residential real estate**	**Building and loan associations**	**Credit standards**

Building and loan associations expect recovery in their profitability over the medium term

Operating result after valuation of loans and securities, and cost-income ratio, operating result as % of total assets[1]



[1] Excluding institutions with allocated new business.

Source: *Low-interest-rate survey 2017.*

Current situation

- Ongoing demand for savings and loan contracts.
- Loan conditions in older contracts not attractive in comparison with current market conditions:
  - Ratio of loans to deposits at an all-time low.
  - Earnings under pressure owing to high expenditure on desposits.

Outlook

- Given consistently low or rising market interest rates, building and loan associations' profitability will recover over time.
- If interest rates go on falling, pressure on earnings will continue.
- Given an abrupt rise in interest rates, no restricted allocation capability or extended waiting times can be deduced.

Focus was likewise on credit standards

1,555 small and medium-sized banks and savings banks

Stress test

P&L forecasts

Credit risk

Forecast of supervisory figures

Market risk

Qualitative questions

Interest rate risk

Other risks

Residential real estate

Building and loan associations

Credit standards

Largely stable credit standards for loans to enterprises

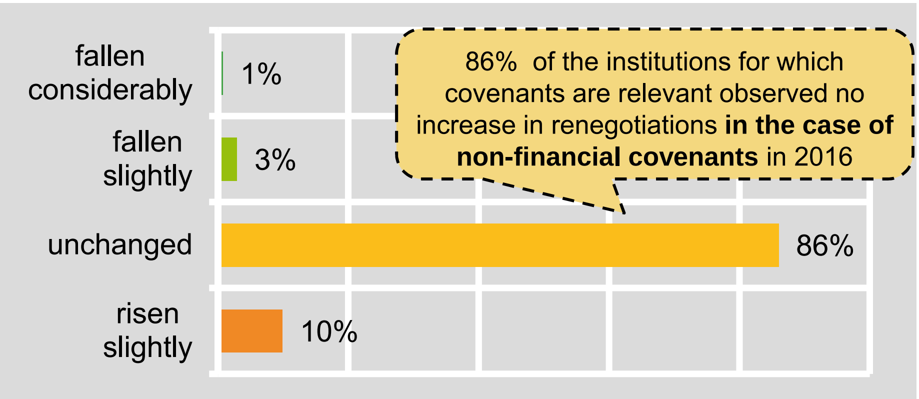
Loans to enterprises often contain **covenants** (contractual agreements with special rights to terminate the contract) which are linked to financial (e.g. capital ratio) or non-financial (e.g. change of ownership) ratios.

Trend since 2015:

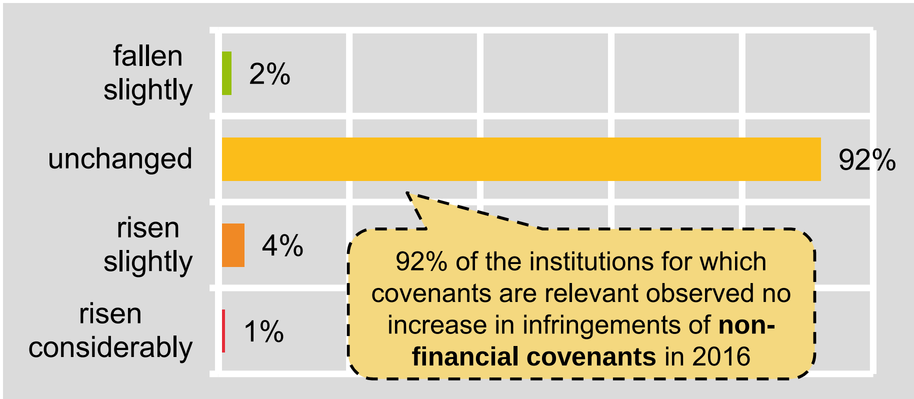
Moderate increase in relaxations of the covenants in renegotiations.

Infringements of non-financial covenants since 2015 only marginally more significant.

Renegotiations with relaxation[1]
2015 to 2016



Infringements of non-financial covenants[1]
2015 to 2016



[1] Percentages relate in each case to that part of the institutions for which covenants are relevant.

Source: *Low-interest-rate survey 2017.*

Structured overview of potential risks from the low-interest-rate environment

1,555 small and medium-sized banks and savings banks

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