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Results of the 2019 LSI stress test

Press conference on 23 September 2019

Agenda

I. Background

II. Survey

III. 2019 LSI stress test

IV. Real estate financing

V. Credit underwriting standards

Background to the 2019 LSI stress test

Background

- **Fourth survey** since 2013 – focus of the survey:
  German "Less Significant Institutions" – LSIs
- This year, the Bundesbank and BaFin surveyed **1,412 banks and savings banks** regarding their current and future earnings and resilience
- Covers almost **all small and medium-sized institutions**; significant institutions under the European Central Bank (ECB)'s direct supervision are not included
- **89 % of credit institutions** and **38 % of the total assets** represented in the survey
- Survey filled out between **the start of April and the start of June 2019**, followed by quality checks until the start of September 2019
- The stress effect is used to determine the future **Pillar 2 Guidance**

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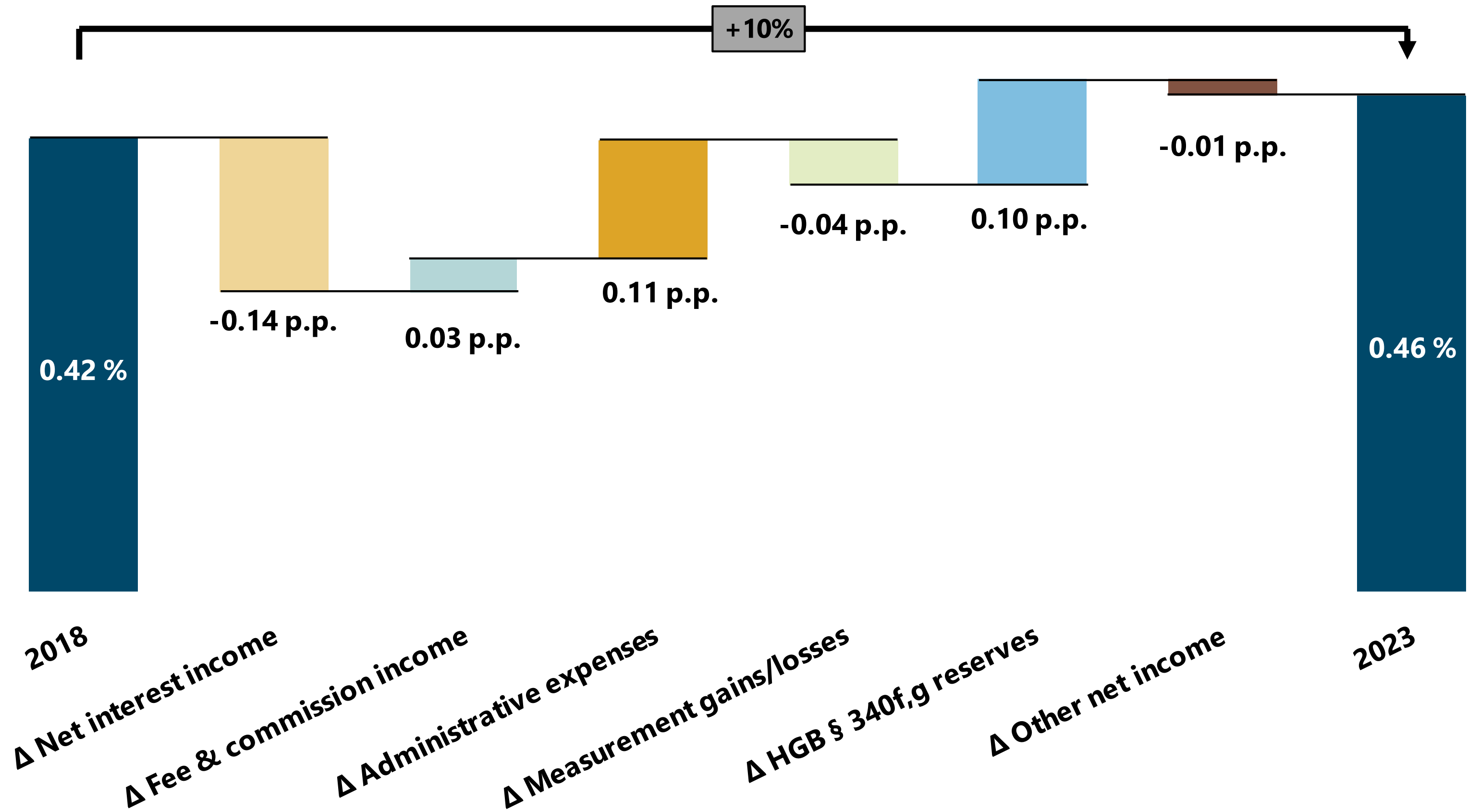
Overview of the survey results

	Institutions’ five-year planning data	Rating
Quality of planning	▪ Approximately half of the institutions had expected an upturn in interest rates and were therefore too optimistic in their plannings ▪ Overall, plans have historically been rather conservative	Conservative planning provides buffer for downward revisions
Profitability	▪ Institutions planning for increase from 0.42 % to 0.46 % ▪ Figures too optimistic if upturn in interest rates does not occur	Return on assets at historically low level
Risk exposure	▪ Risk-weighted assets (RWA) increasing more quickly than total assets ▪ Institutions agreeing longer-term fixed interest rates	Consistent trend towards increased risk exposure can lead to considerable strain in the future
Solvency	▪ Capital ratios good overall in comparison with previous years ▪ Just under 1/3 of the institutions planned for a reduction in Common Equity Tier 1 (CET1) ratios ▪ Planned CET1 ratios increasing from 16.5 % to 16.8 % by 2023	CET1 ratios increasing but with higher risk exposure

Plans for increased return on assets too optimistic

Planned return on assets for 2023 compared with 2018

Return on assets in % / proportion of total revenue contribution as percentage points (p.p.) of total assets



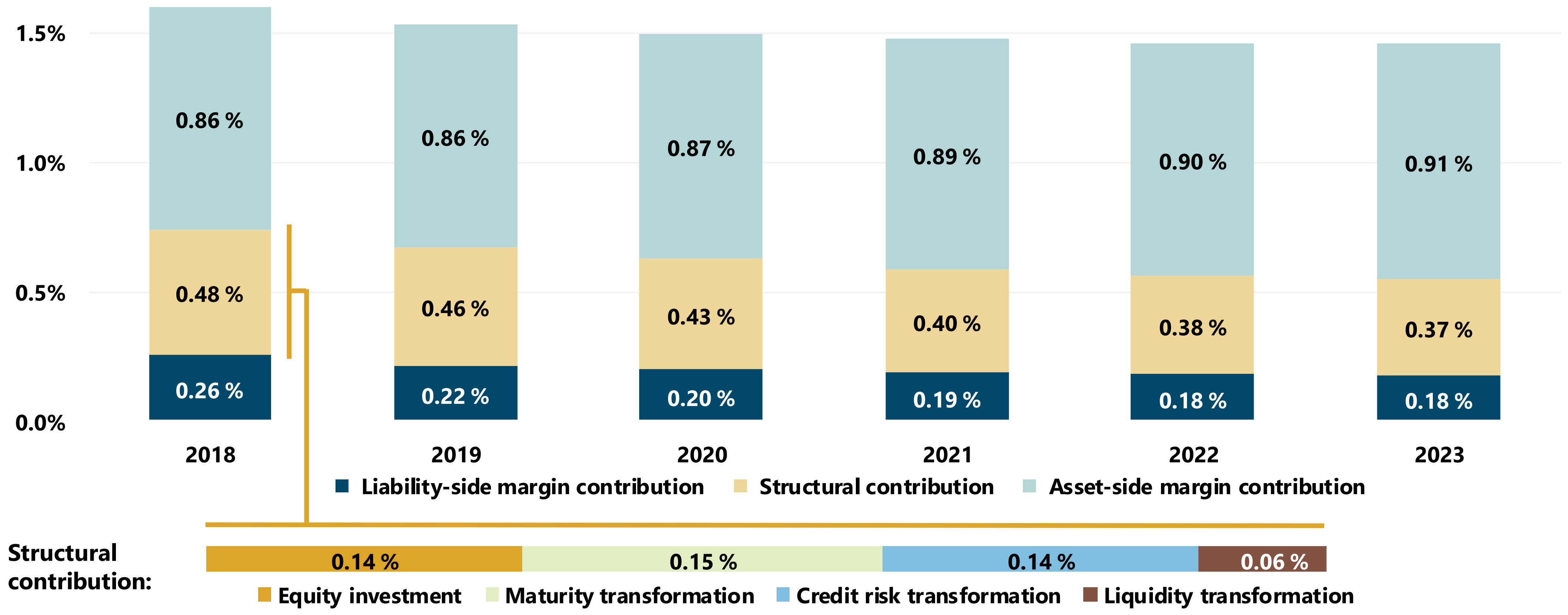
- Clear differences between the forecasts of **institutions planning for upturn in interest rates and those that are not**
  - with upturn in interest rates: 18 %
  - without upturn in interest rates: -2 %.
- Due to the reduction in interest rates that has occurred in the meantime, it appears that even **the plans without an upturn in interest rates are too optimistic.**

Note: Impairments disclosed without reserves in accordance with section 340f of the German Commercial Code (*Handelsgesetzbuch* – HGB). Δ (Delta): Difference

Low liability-side margin contributions and declining structural contributions exert pressure

Contributions to net interest income in planning scenario

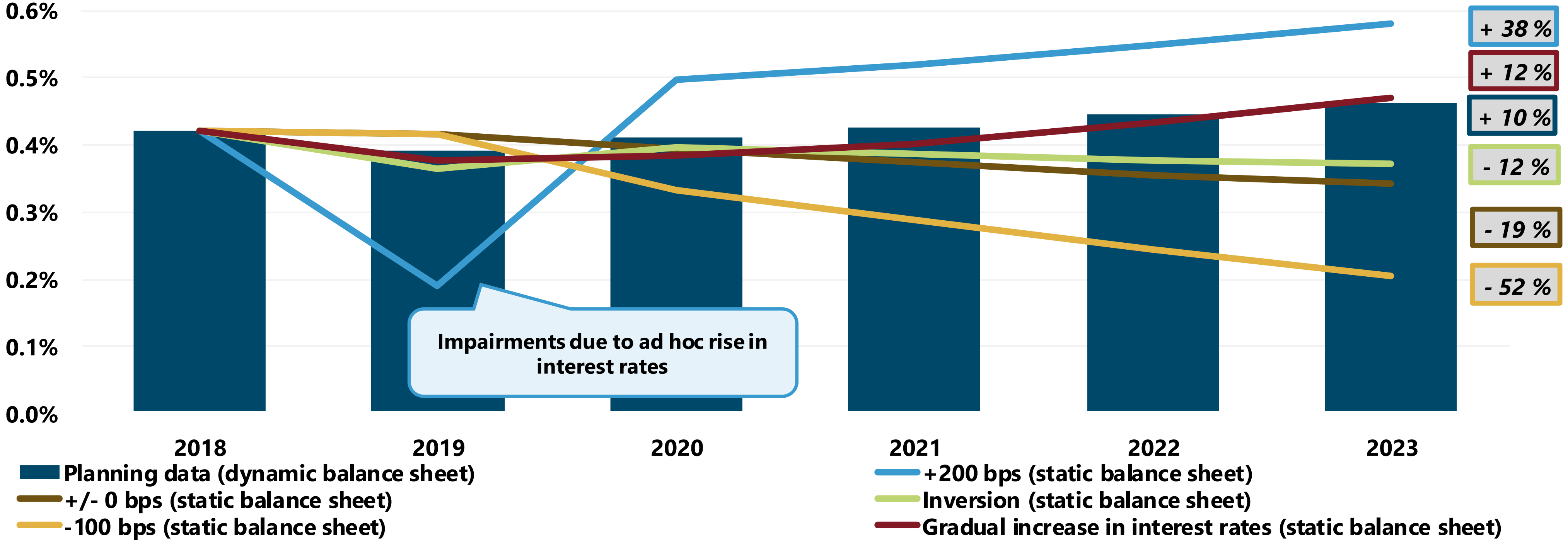
Margin contributions and structural contributions



Institutions reported on their own planning data and on five interest rate scenarios defined by supervisors

Return on assets

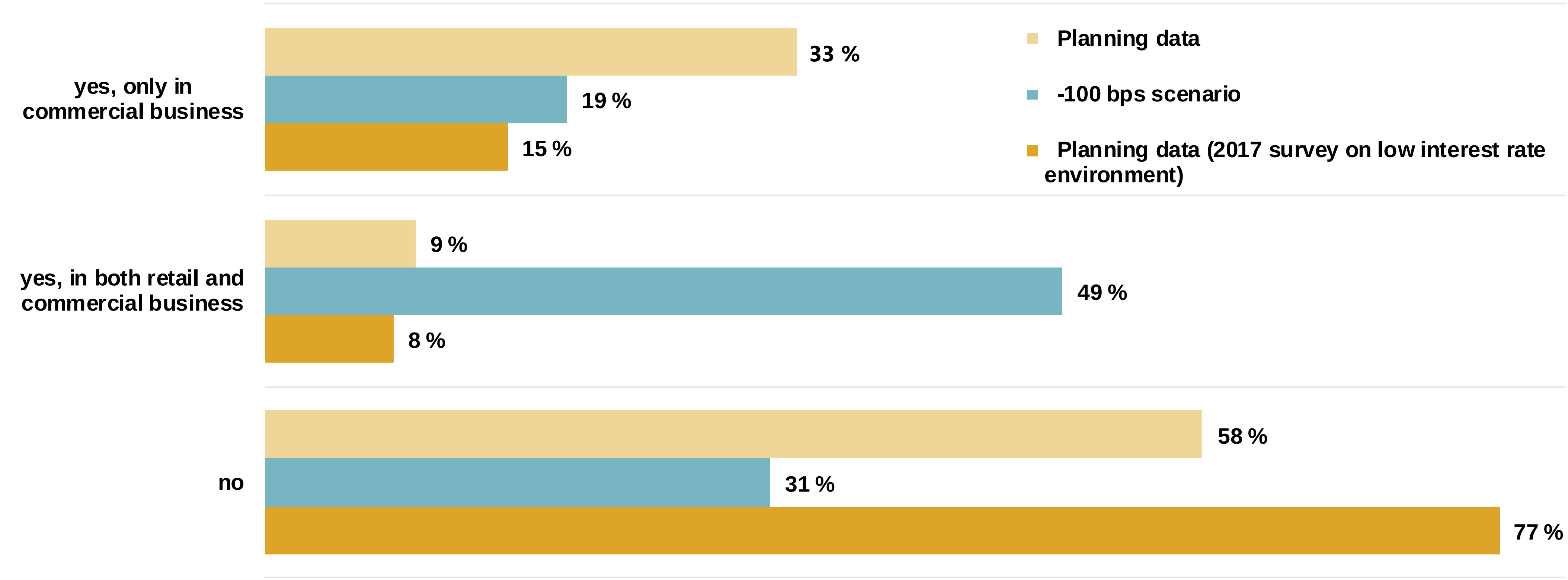
Net profit for the year before tax to total assets



Note: "Static balance sheet" means that existing business that matures is replaced by equivalent new business with current conditions. "Dynamic balance sheet" means that there are no supervisory restrictions with regard to the balance sheet structure. bps: basis points

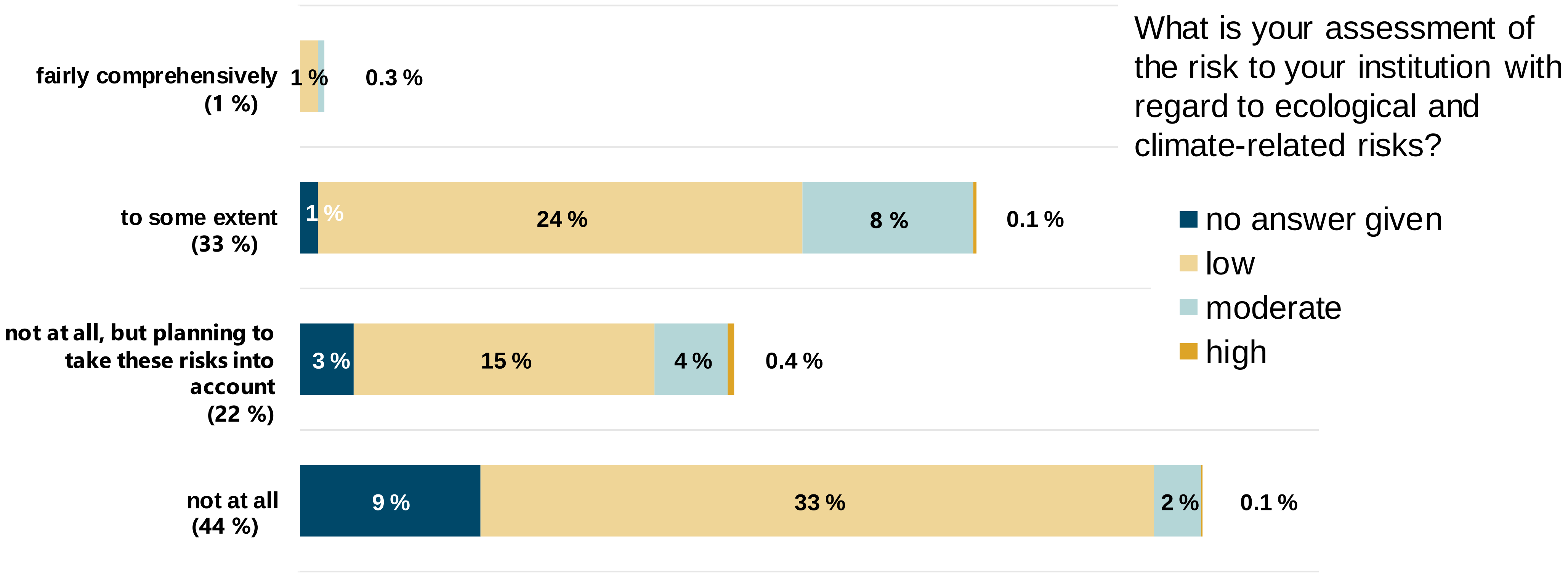
Willingness to pass on negative interest rates has increased

Were negative interest rates on deposits passed on in the respective scenarios?



Management of climate risks still in early stages

To what extent do you currently take into account ecological and climate-related risks in your risk management?



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Stress testing: Method and results

Method and assumptions

Simulation of the **full profit and loss statement (P&L)** over a **three-year stress horizon**

The simulation assumes a **severe economic downturn**

All **material risks** considered

Interest rate risk	Market risk	Counterparty risk	Other P&L
▪ **Increase** of the yield curve by 45 to 173 basis points ▪ Net interest income on the basis of a simplified **interest rate gap analysis**	▪ **Rise in interest rates** (analogous to interest rate risk) and **increase in credit spread** between 71 and 1,446 basis points ▪ **Haircuts** on other positions of between 5.8 % and 30.7 %	▪ **Automatic calculation** of the valuation reserves based on the probability of default (PD) and loss given default (LGD) ▪ PD and LGD paths dependent on **starting parameters**	▪ **Forward projection** on the basis of historical data, in case of some positions **with haircuts** ▪ Consideration of **one-off effects** on an individual basis

Results

The German **institutions** proved to be resilient even **under stress**

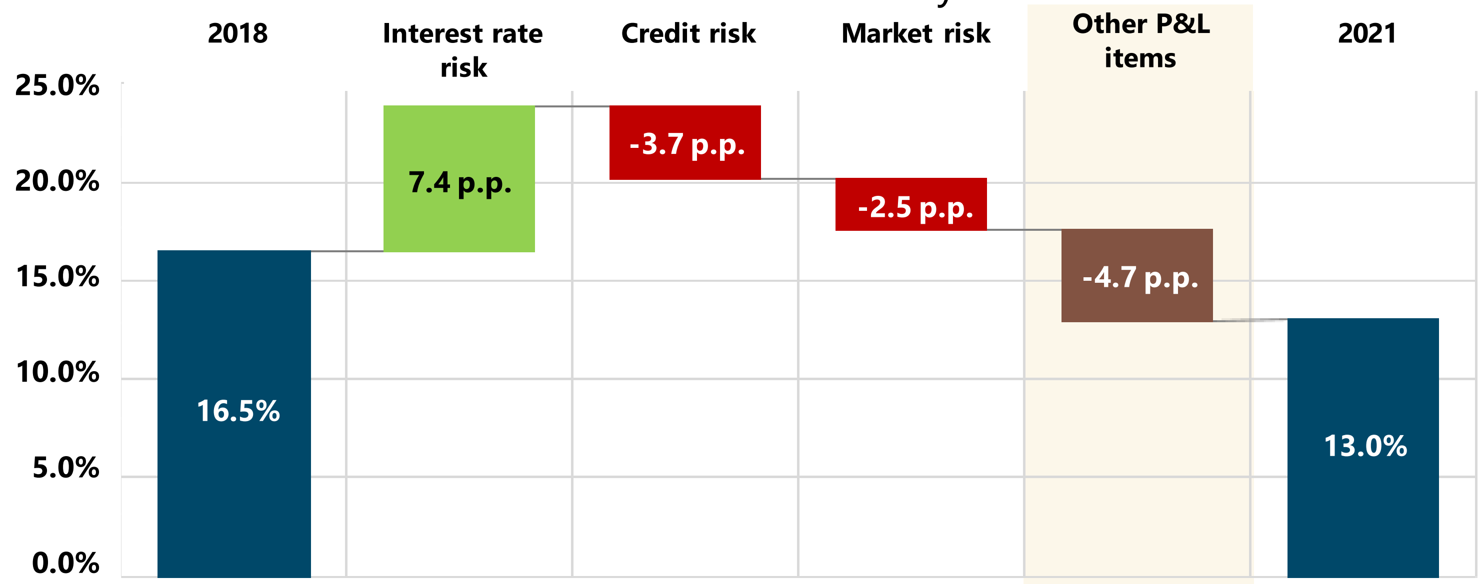
On average, the **stress effect** was approximately **3.5 percentage points**

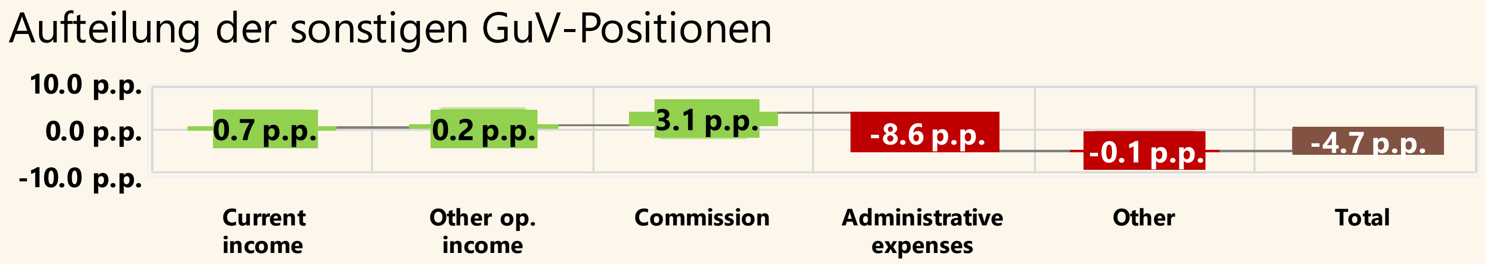
The stress effect is used to determine the future **Pillar 2 Guidance**

Stress effect is mitigated significantly by net interest income

Cumulative impact of stress effects

Evolution of CET1 ratios between 2018 and 2021 by risk area



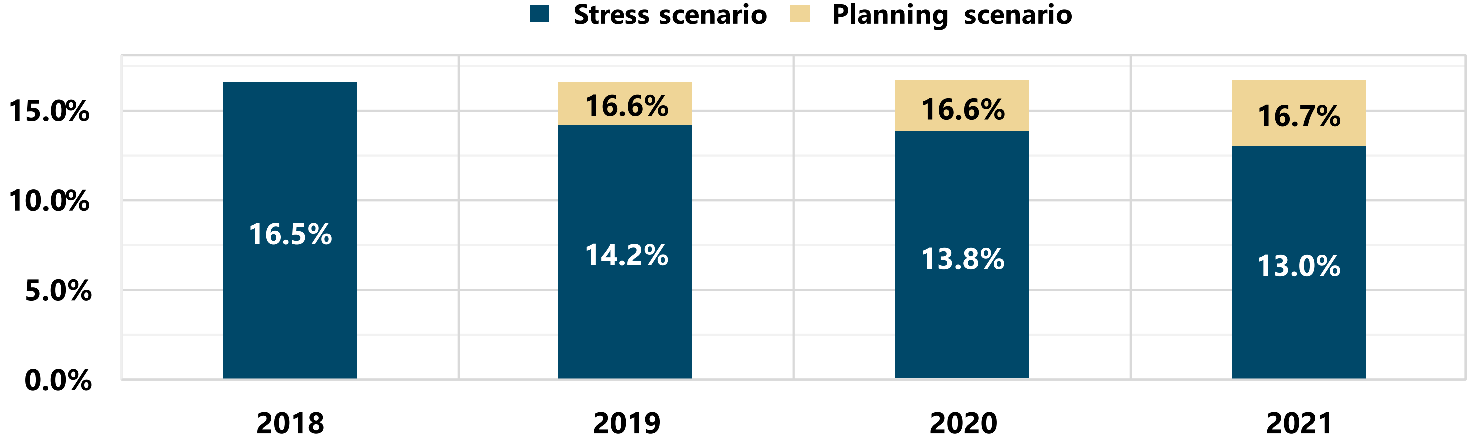


- The **greatest stress impact** occurs **in the first year**. The cause for this is the sudden shock to market risk.
- The **worst CET1 ratio** is obtained **in the third year**, at 13 %. Without considering the rise in interest rates in the scenario an **increase of 1 p.p. in CET1 ratio** in 2021 would materialize.
- The **net interest income** continues to yield **the best returns**, even in a stress scenario.
- **Credit risk and market risk** together contribute 6.2 p.p. of the stress result.
- Other P&L items are dominated by **administrative expenses**.

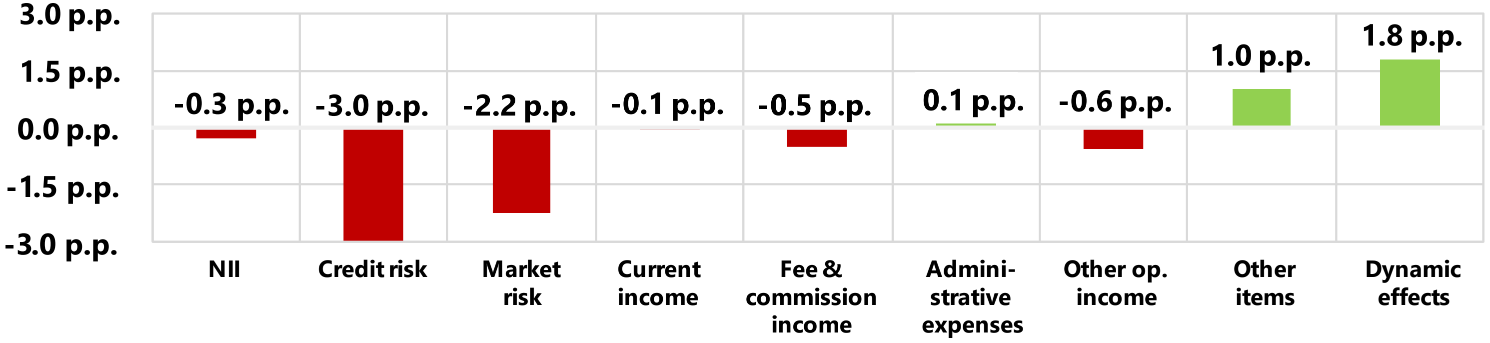
Reduction in capital of just under four percentage points compared with the planning scenario

Comparison of change in capital

CET1 ratios between 2018 and 2021



Impact on capital stress scenario vs planning scenario between 2019 and 2021

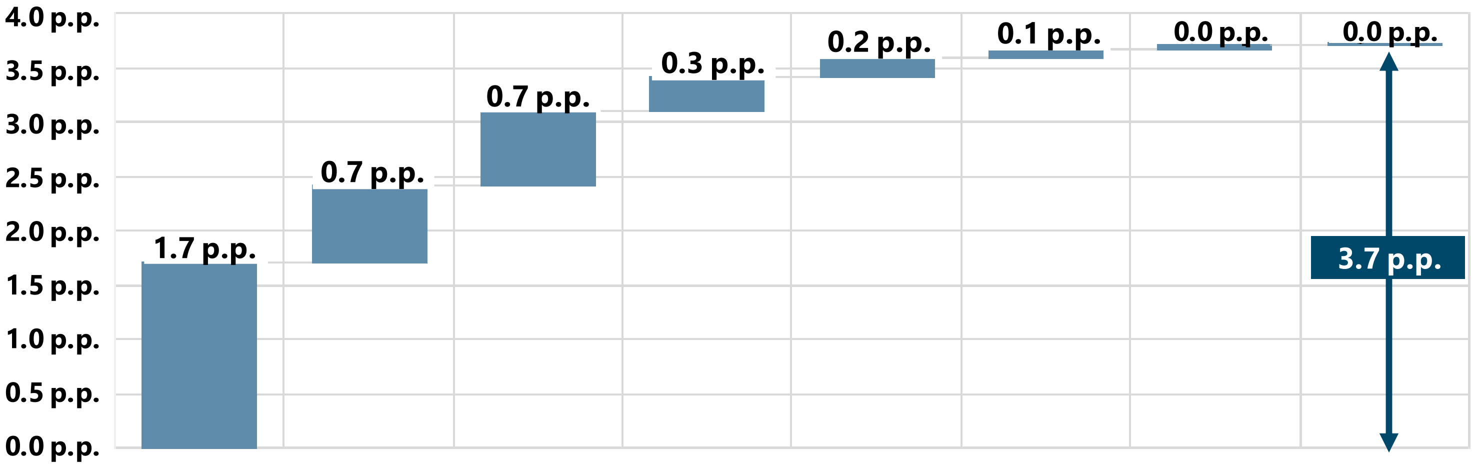


- **In the planning scenario, capital ratios rise** marginally.
- In the **stress scenario, the CET1 capital resources fall** by 3.7 p.p. in comparison with the planning scenario.
- The stress effect is reflected **in all significant revenue items**. **Effect mainly a result** of **credit and market risk**.
- Other items are driven primarily by **higher tax payments in the planning scenario.**
- **Dynamic effects** such as an increase in the balance sheet total are **not included in the stress scenario**.

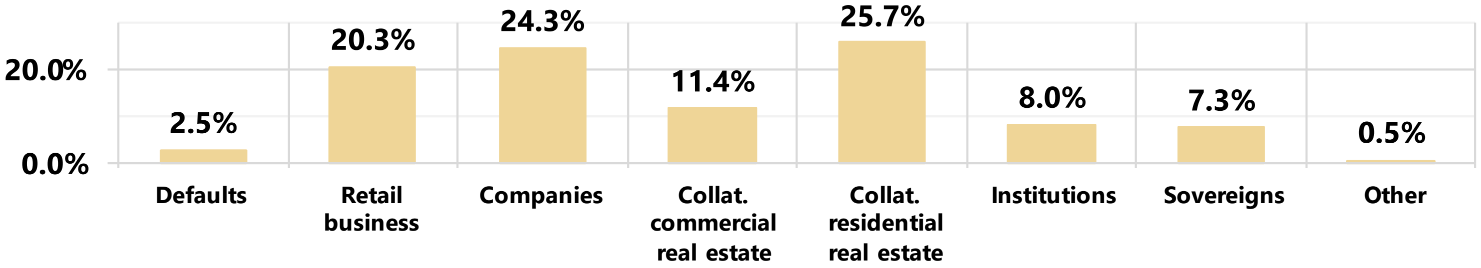
Credit risk driven by exposures in default

Stress effect and share of risk volume by exposure class

Cumulative CET1 effect over three years



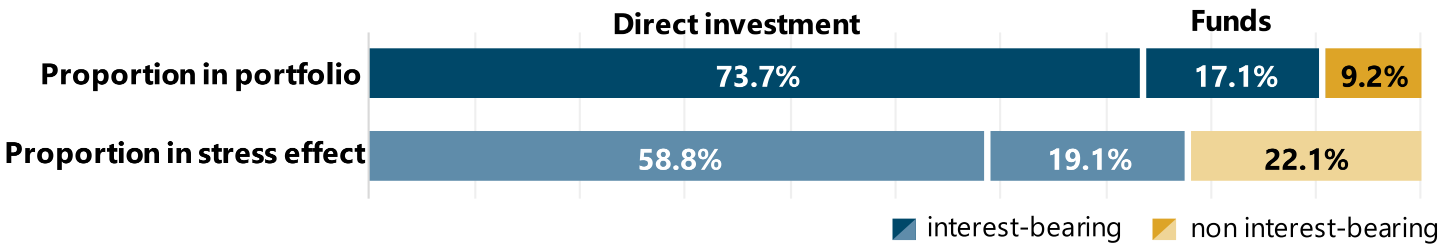
Proportion of risk volume in 2021



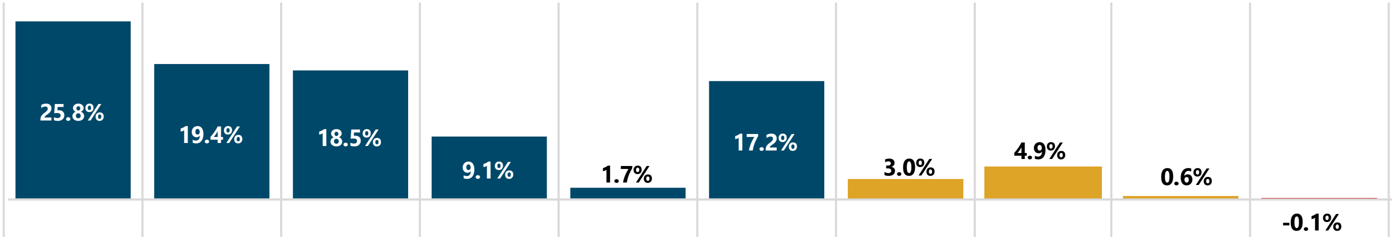
- The stress scenario causes the **exposures in default to more than double** (increase by just under 150 %).
- The **main driver for the stress effect** in the credit risk is the **default class.**
- The **stress effect** on the exposure classes **sovereigns and institutions** is, as is to be expected, **marginal**.
- The **stress effect** on the exposure class **residential real estate** is also only **minimal**, despite the high exposure.

Clear stress effect from interest-bearing items

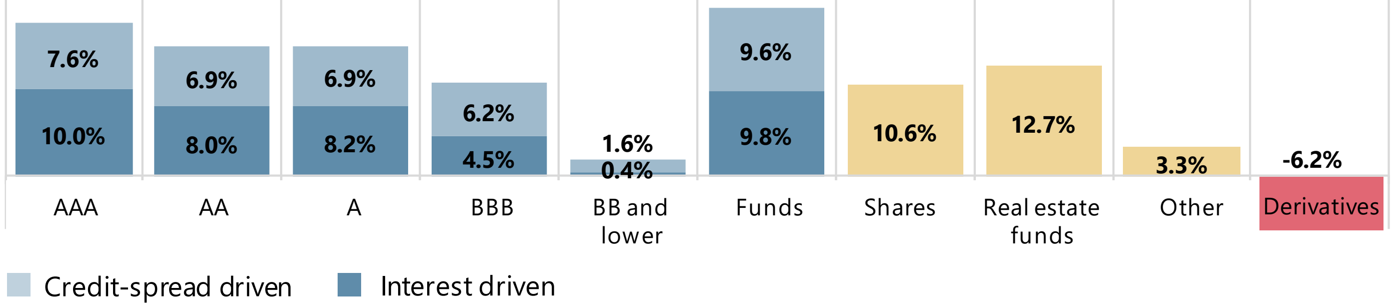
Proportion in overall portfolio and proportion of stress effect



Proportion in portfolio (by rating class and risk category)



Proportion in CET1 effect (by rating class and risk category)

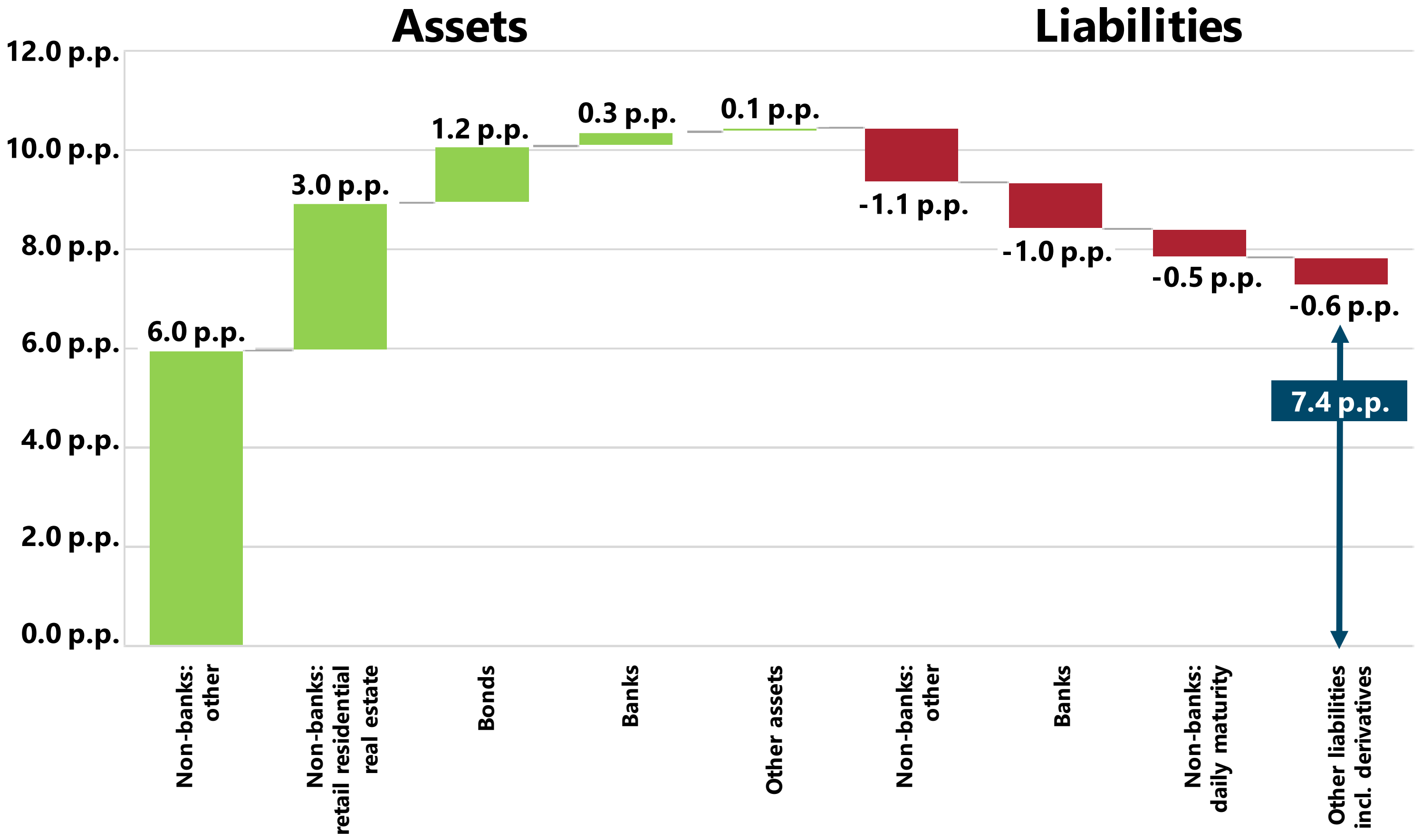


- Interest-bearing items (incl. interest rate swaps) account for more than **90 % of the portfolio dominating the stress effect** in the market risk.
- **Non-interest-bearing items** (direct investments and held via funds incl. respective derivatives) have a disproportionately high contribution to the stress effect, in particular **shares** and **real estate funds**.
- The stress effect is shown after **offsetting** the hedging-effects and price reserves.
- On average, **derivatives** led to a **reduction** in the stress effect.
- There is **no significant change in the risk taking** in comparison with the 2017 survey on the low interest rate environment.

Interest income still has compensating effect in stress test

Effect of interest rates on individual portfolios

Cumulative CET1 effect over three years



- **Despite the assumption of a rise in interest rates**, there is a fall in **net interest income** in the stress test.
- This is caused by the **shorter interest rate fixation period on the liabilities side** and **assets with higher interest rates maturing**.
- The majority of the interest income is earned through **business with retail and commercial clients**.
- **Refinancing** is primarily through **retail deposits**.
- **Credit risk defaults** lower interest income.

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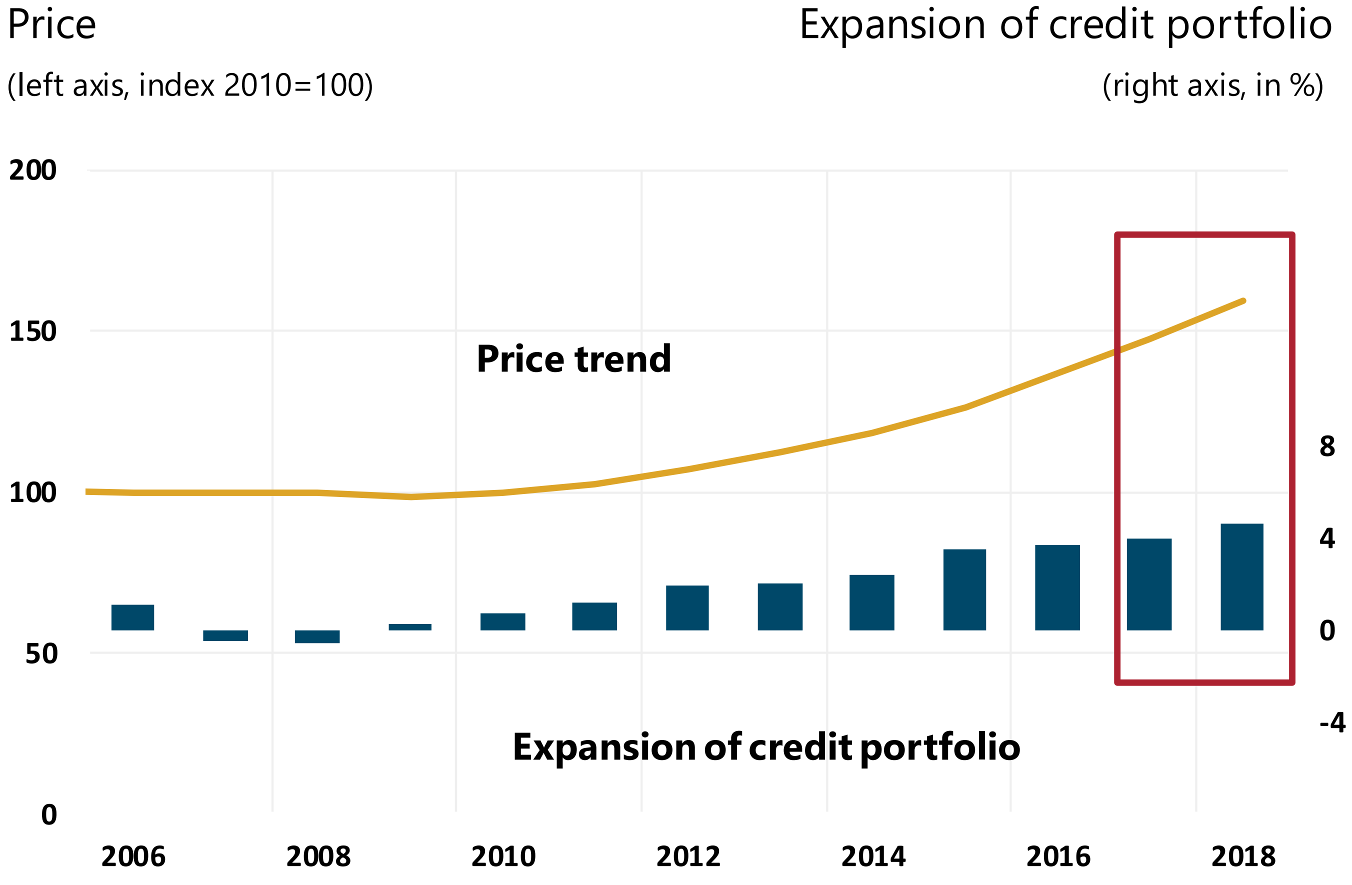
Banks continuing to expand their real estate business

Retail residential real estate financing



Source: Bundesbank calculations based on price data from bulwiengesa AG; banking statistics, data for Monetary Financial Institutions (MFIs) adjusted for statistical changes.

- Portfolio expansion at **highest level** since the financial crisis.
- The majority of the banks surveyed **plan for further expansion**.

Credit standards for residential real estate financing less conservative, but not critical

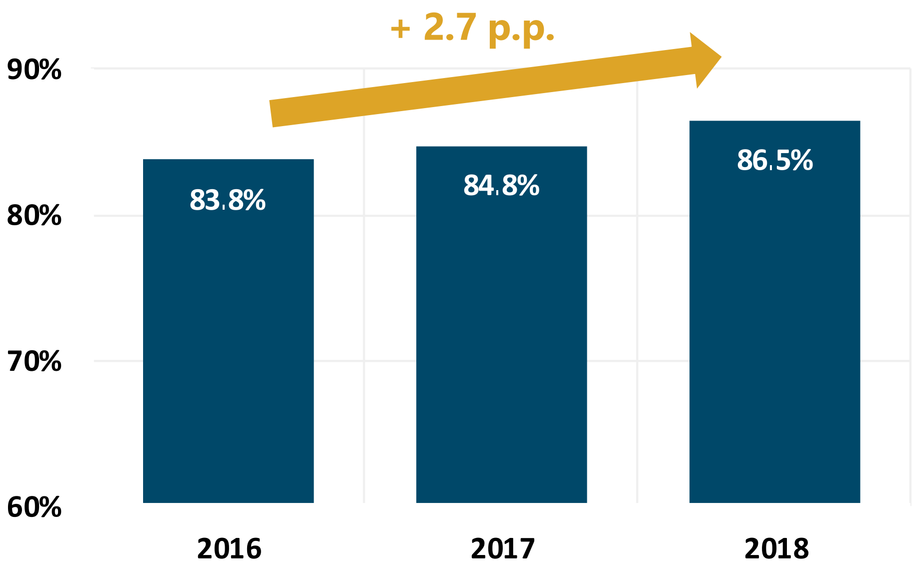
New business lending: retail residential real estate financing

Credit characteristics (volume-weighted)

	2017		2018
Avg. total loan amount	€ 134,360	**+10.2%**	€ 148,010
Avg. annuity	€ 7,061	**+6.4%**	€ 7,510
Avg. repayment rate p.a.	3.48%	**-0.2 p.p.**	3.25%
Avg. interest rate p.a.	1.77%	**+0.1 p.p.**	1.83%

Avg. loan-to-value

(absolute level not fully reliable)



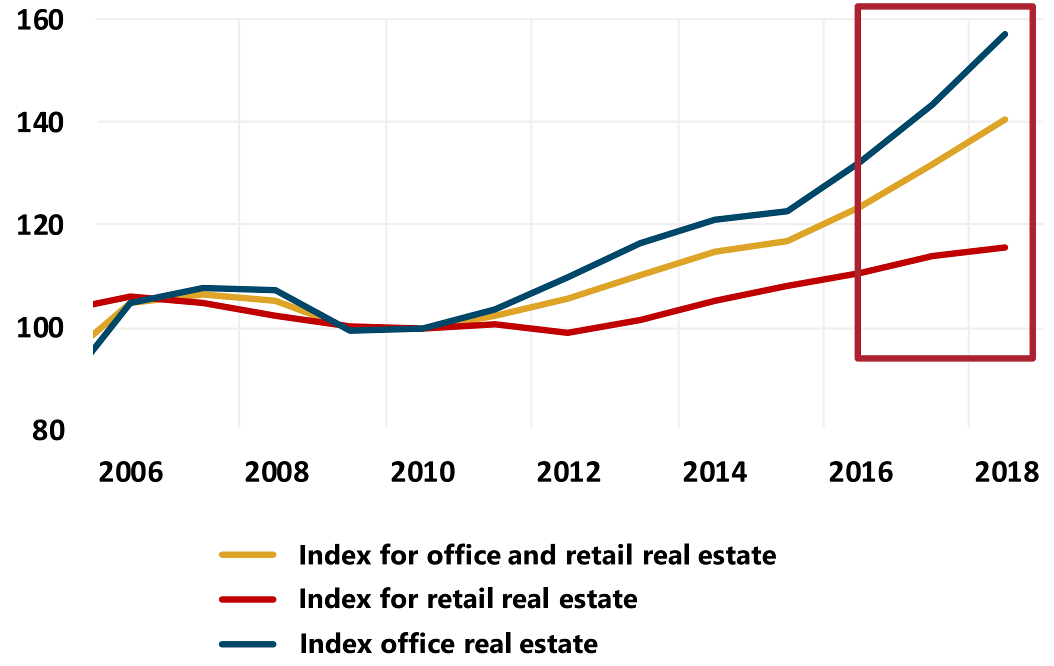
Source: 2019 survey on real estate financing, based on data from 1098 banks and savings banks with large residential mortgage portfolios. p.a. (per annum): per year

Expansion of commercial real estate financing volume; no clear indication of credit standards loosening

Commercial real estate financing

Price commercial real estate

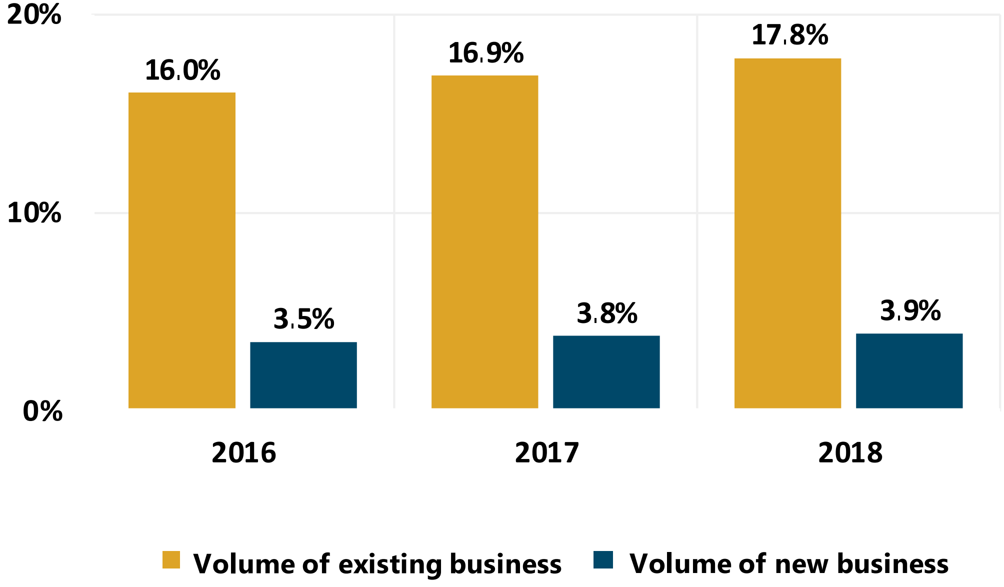
(Index 2010=100)



Source: vdpResearch GmbH.

Lending volumes for existing and new business

(average share of total assets among surveyed banks)



Source: Based on data from 383 institutions with large commercial mortgage portfolios.

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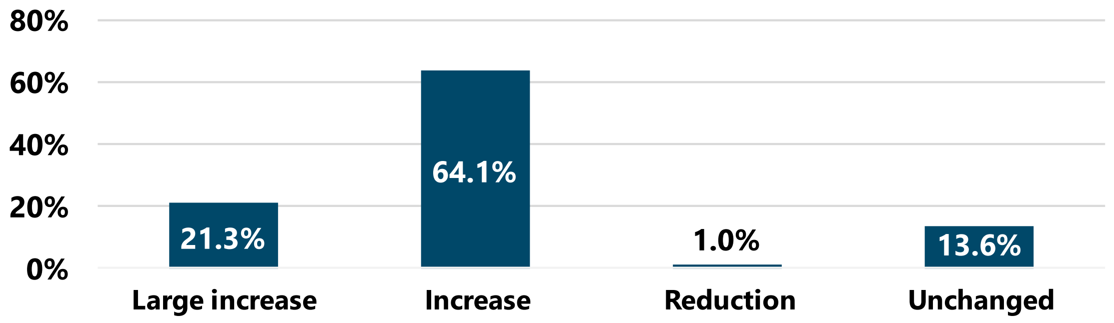
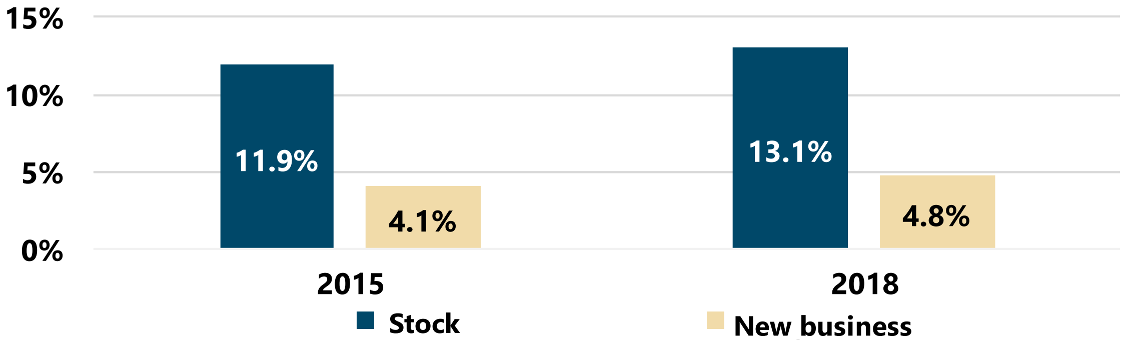
Indications for loosening of credit underwriting standards

Assessment of market competition in corporate financing since 2015



Volume of stock and new business in sampled portfolios

(average share of total assets in %)



Purpose of survey

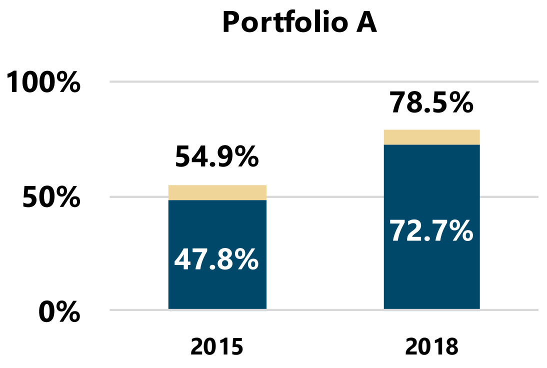
- To investigate the trends in credit underwriting standards in **corporate financing**
- **105 banks** were included in the survey
- Two portfolios were sampled: borrowers that are corporates with an annual turnover of between EUR 50 million and EUR 500 million **(portfolio A)** and corporates with an annual turnover of over EUR 500 million **(portfolio B)**

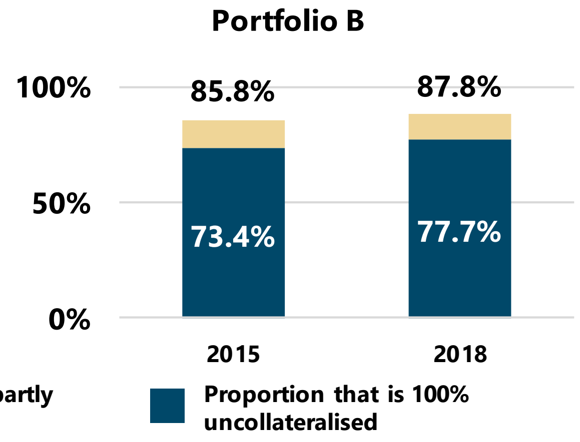
Results of the survey – on the basis of term loan structures

- **Individual indicators for loosening of credit underwriting standards**
- Share of new business with **good credit ratings increased;** meanwhile **margins declined**
- Approx. 85 % of banks have seen an **increase in** domestic **competition** since 2015
- The **particularities** of contract terms and conditions of the portfolios are often **becoming more similar**

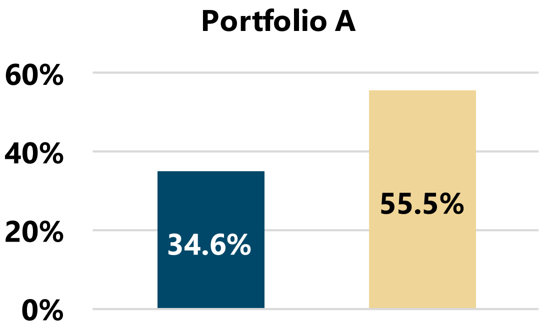
Increase of unsecured shares and bullet loans

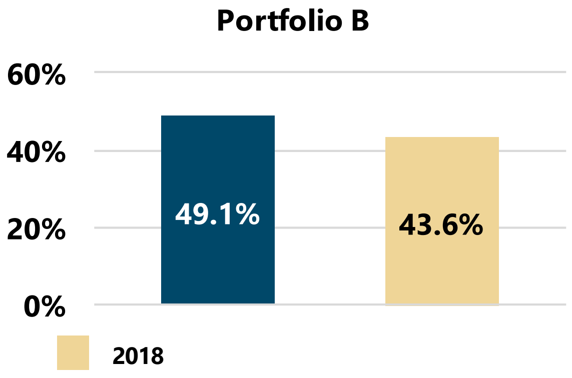
Uncollateralised proportion of new business





Proportion of bullet loans in new business





Collateralisation

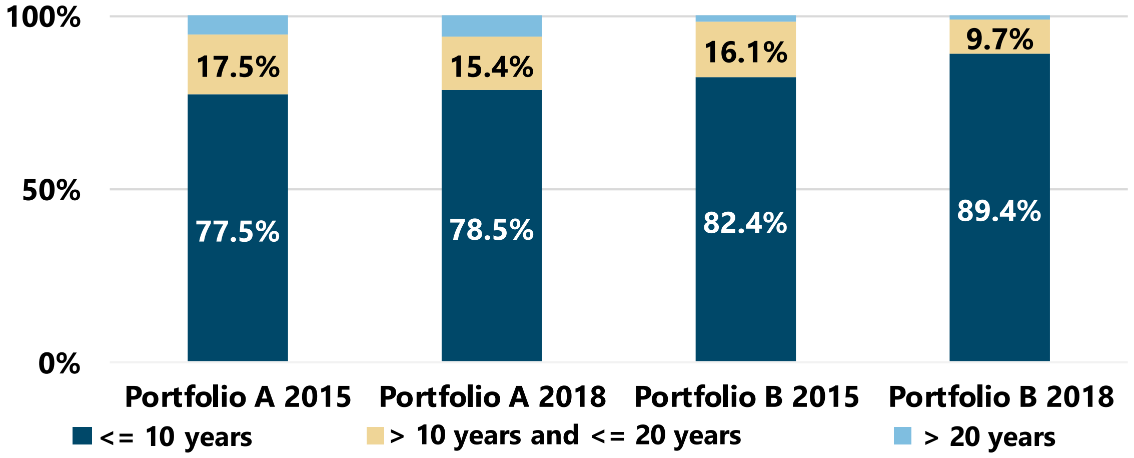
- The **proportion of uncollateralised** business has risen in both portfolios; the proportion that is "100 % uncollateralised" has expanded; Meanwhile, **no changes** seen in banks' internal policies for collateral allocation
- **Real estate collateral** does not play a significant role; key risk indicator loan-to-value is therefore of little significance.

Repayment schedule

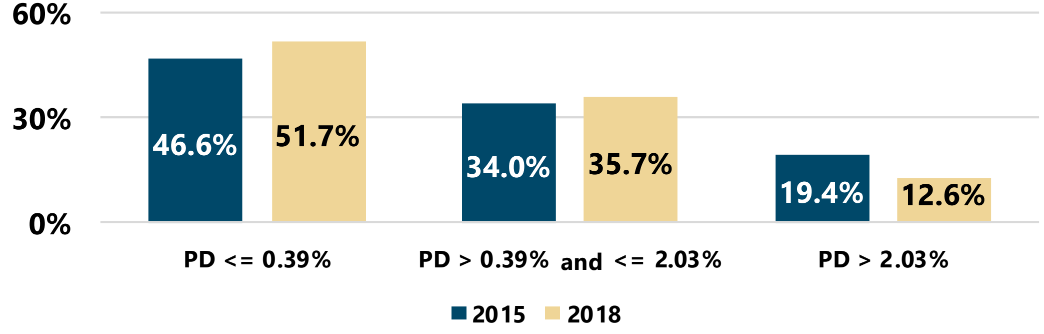
- The proportion of **bullet loans** has **increased** in portfolio A (slightly decreased in portfolio B). Meanwhile, the **fixed interest rate periods** have remained **steady** (portfolio A) or **reduced** (portfolio B).

Increasing importance of short maturities and good credit ratings

Trends in contract maturity



Distribution of new business by PD in portfolio A



Contract maturity

- Very **high proportion** of term lengths of **less than 10 years**; volume of contracts with terms between 10 and 20 years is falling
- **Reduction in average contract term** by around a year in each of the two portfolios with a slight increase in the average loan size

Credit ratings and margins

- **Increase in share of new business** contracts with **good credit ratings** in both portfolios; meanwhile decline of margins
- Heterogeneous development of interest rate spreads in **portfolio B** caused mainly by **one-off effects**

Types of contracts

- **Clear trend towards standard contracts**; doubling of share of new business contracts to 48 % in portfolio A and 25 % in portfolio B

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