



EUROPEAN CENTRAL BANK

BANKING SUPERVISION

SSM-wide stress test 2018 Final results

1 February 2019

ECB/SSM performed two supervisory stress test exercises for significant institutions (SIs) in 2018



EU-wide EBA stress test

- **33** SSM SIs (“EBA banks”)^{1,2}
- **4** Greek banks underwent the same stress test under the EBA scenario and methodology
- **Public disclosure** of bank-specific results
- EU-wide exercise under **EBA coordination**, in cooperation with ESRB, ECB and NCAs



SSM SREP stress test

- **54** other SSM SIs (“SREP banks”)¹
- Under **ECB/SSM coordination**
- **Public disclosure** of aggregate results
- **EBA methodology applies** with reduced complexity (i.e. proportionality)

Objectives

- Assess the **resilience of financial institutions** to adverse market developments.
- **Contribute to the overall Supervisory Review and Evaluation Process (SREP)** to ensure institutions’ capital and liquidity adequacy, as well as sound risk coverage and internal processes.
- Ensure a **consistent treatment** of all SSM SIs.

The results of both exercises will feed into the SSM SREP

¹ Combined number of SIs included in EBA and SSM SREP stress test samples does not equal total number of SIs under SSM supervision, as some exceptions apply (e.g. banks that were subject to a comprehensive assessment in 2017 or will be in 2018; or SIs that are subsidiaries of other SSM SIs, already covered at the highest level of consolidation).

² The results for the EBA and total sample shown on the following pages include the 33 SSM SIs but not the results for the four Greek banks, whose results were published on 5 May 2018

Agenda

- 1 Key takeaways from the exercise
- 2 Setup of the exercise and scenarios
- 3 Horizontal overview of results
- 4 Impact analysis by risk type
- 5 Integration of stress test results into the SREP
- 6 Conclusions

The adverse scenario results in a system-wide CET1R depletion of 4.0pp on a fully loaded basis

- The 2018 stress test is based on a **consistent and severe macroeconomic scenario**, which features a **GDP contraction of 2.4%**, **real estate price shocks of 17%** and an **equity price correction of 31%** for the euro area.
- The scenario reflects the **main systemic risks** identified at the beginning of the exercise, e.g. abrupt and sizeable **repricing of risk premia** in global financial markets; adverse feedback loop between **weak bank profitability and low nominal growth**; and **public and private debt sustainability** concerns.
- The adverse scenario results in a total **system-wide CET1R depletion of 4.0pp** on a fully loaded basis, reducing the system-wide **CET1 capital from 14.1% year-end 2017 to 10.1% in 2020** including a 0.3pp impact from the first time application of IFRS9.
- Key drivers of the results under the adverse macroeconomic scenario are **credit impairments, a funding spread shock** partly offset by a positive effect from higher long-term interest rates; a significant stress to **Net Fee and Commission Income**, and the impact of market price and liquidity shocks on fair value portfolios.
- **EBA banks** exhibit **lower depletion** in CET1R than **SREP banks**, mainly driven by higher income generation from NII and from client revenues from market operations under the adverse scenario.

Higher depletion under adverse scenario compared with 2016 reflects a more severe macroeconomic scenario

- **Compared to the 2016** Stress Test, **the depletion** under the adverse scenario **is higher** which reflects a **more severe macroeconomic scenario**, the introduction of IFRS 9, but also a more risk-sensitive methodology (e.g. the use of internal models for NFCI). This **overcompensates effects from improved asset quality** in particular due to the successful **reduction of NPL volumes** and a **benefit from the steeper increase of long-term interest rates** in the scenario. However, banks with relatively high NPL ratios still tend to have a higher depletion.
- Despite the higher depletion, the **aggregate ending capital ratio of 10.1% CET1** after stress is **higher than in 2016 with 8.8% CET1**. This confirms an **improved resilience of participating banks** to withstand macroeconomic shocks. At the same time the exercise also exposed **vulnerabilities of individual banks** as well as identified clusters of banks subject to certain risk areas like conduct risk.

Further key takeaways from the 2018 Stress Test

- **Emerging market economies** show higher net interest margins under the adverse scenario, **counter-balancing otherwise higher credit losses** in these countries.
- Credit losses are mostly explained by the **macroeconomic scenario**. **NPL stocks** play a less prominent role in the 2018 exercise compared to 2016 due to improved balance sheets.
- The adverse **full revaluation impact in market risk** is **concentrated among 6 G-SIBs**, which can however largely compensate these losses with **high client revenues**. The stress impact **on liquidity and model uncertainty reserves** also mostly affects these banks.
- **Conduct risk losses from known cases** play a less prominent role compared to 2016, as many legacy cases have been settled since, and are concentrated among the G-SIBs.
- **Adjustments to dividends, AT1 coupons and variable compensation** under Art. 141 CRD (MDA) reduce the overall impact under the adverse scenario by approx. **40 bps**.
- Some banks encountered **data quality issues** that had to be addressed during the QA process.

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Scenario comparison to 2016 and 2014 – 2018 exercise toughest scenario so far

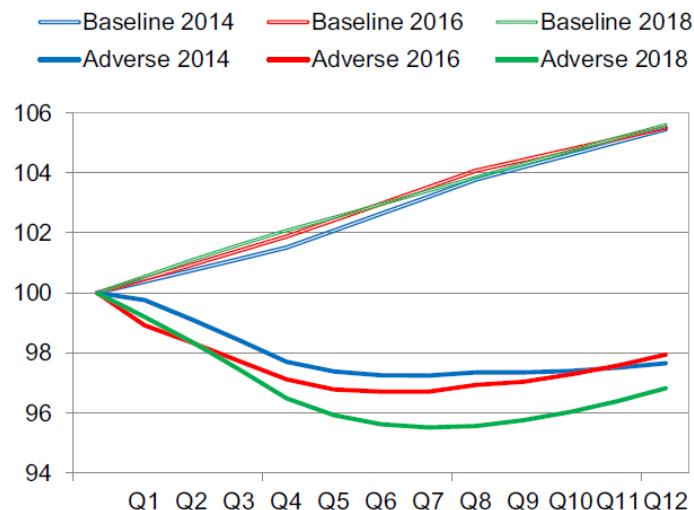
- 2018 ST scenario the **most severe out of all EU-wide ST exercises** so far
- The EBA adverse scenario of the ST 2018 is **significantly more severe** than the market analysts' **forecasts of the negative impact of “Brexit”** on the economy of the euro area¹

EU real GDP deviation from baseline: 2018, 2016 and 2014 EBA stress tests (percentage points)



Source: European Systemic Risk Board

EU real GDP level: 2014, 2016 and 2018 EBA stress tests

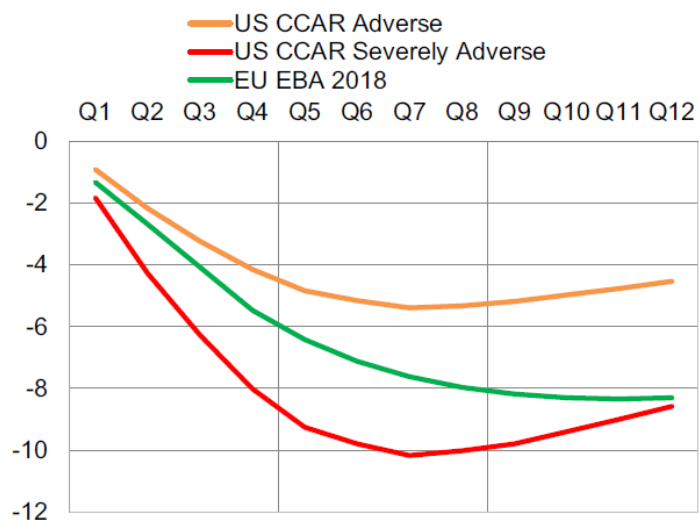


¹ The consequences of a “no deal” scenario were not explicitly considered but the potential economic growth implications were broadly covered by the adverse scenario, which assumed a general, severe worsening of all the main economic and financial variables for the UK. For individual banks, however, Brexit could have severe effects.

EU stress test scenario between CCAR adverse and CCAR severely adverse

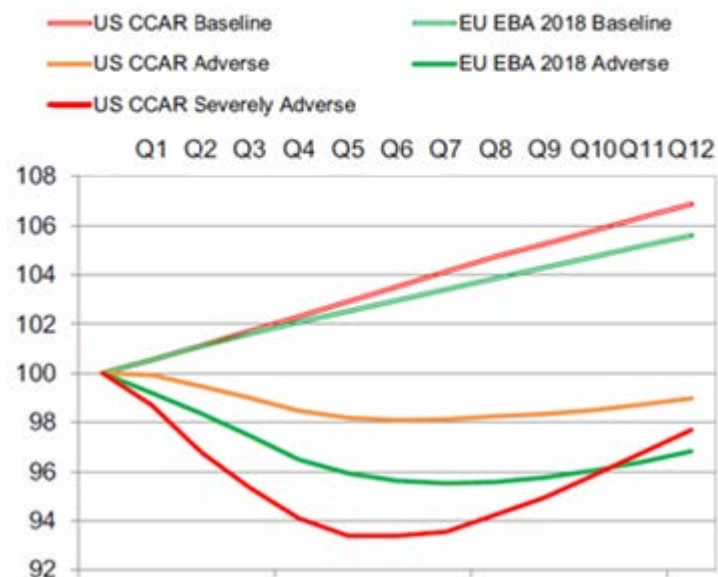
- The severity of the scenario is broadly **comparable** to the one of other **ST exercises (CCAR)**

Real GDP deviation from baseline: EBA 2018 and CCAR stress tests (percentage points)



Source: European Systemic Risk Board

Real GDP level: EBA 2018 and CCAR stress tests



Stress test quality assurance – Challenging bank submissions from four different perspectives

Perspective

Methodology -adjusted view

- Assessment of compliance of banks' submissions with methodological constraints: assess impact when replacing bank parameters with compliant parameters

Top-down view

- Comparison of banks' projections with those from supervisory "Top-Down" models: assess impact when replacing bank projections with Top-Down benchmarks (conditional on a given scenario, using bank-specific reference data as a starting point)

Peer- benchmark view

- Comparison of banks' projections against peers: assess impact when replacing banks' projections with peer benchmarks
- Horizontal assessment of banks' projections, e.g. on portfolio level, both across the euro area and across the same country

Bank view

- Detailed assessment of individual banks' projections
- Takes into account supervisory insights and bank-specific characteristics

Stress test 2018 – A bottom-up exercise in three cycles with a fair and tough quality assurance

Bank-led stress test

February – May 2018

- **Advance data collection**
- **Pre-validation** of templates and submission of bank-led stress test results
- Banks are asked to provide an explanatory note accompanying their submissions

Quality assurance (QA) in three cycles

May – October 2018

- ECB identifies issues from four different QA perspectives, i.e. through methodology-adjusted, top-down, peer benchmark and bank-specific view
- QA follows an integrated process of **three submission cycles**
- Banks receive QA reports after every cycle and are asked to “comply or explain” or - for the last cycle and if a certain projection is not credible - to “comply”

Finalisation of ST results

October – November 2018

- **Publication of results** for EBA banks on **02 November**

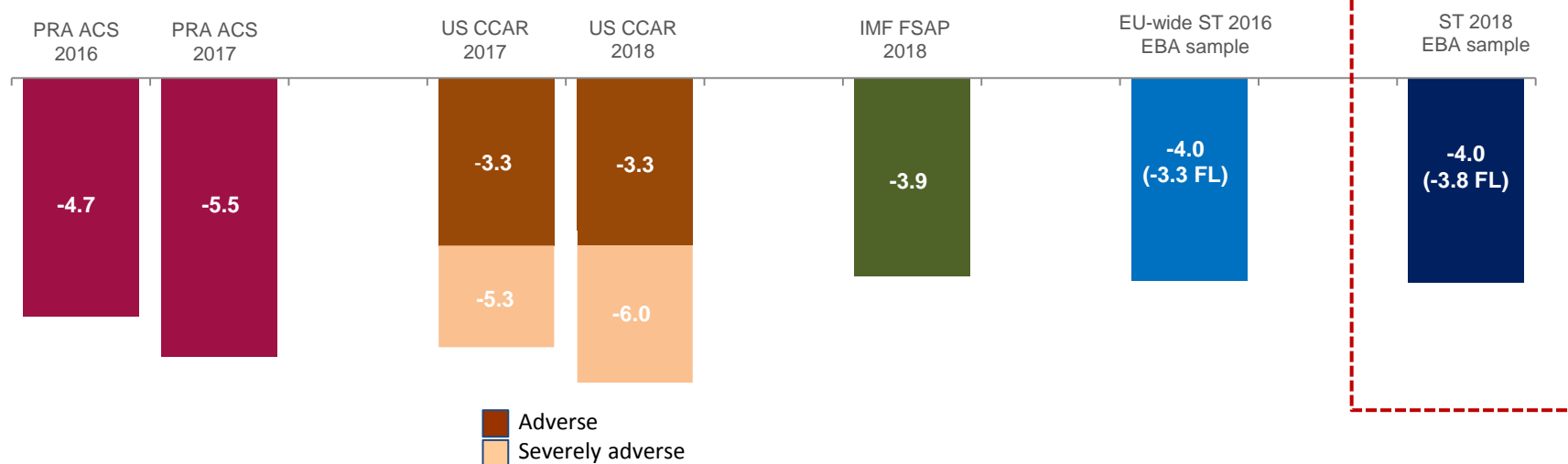
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Comparison of 2018 stress test (EBA sample) with exercises conducted in the US, UK and by the IMF

CET1R (TR) depletion across different ST exercises

In percentage points (pp)



On a transitional basis, current CET1R depletion is similar to final 2016 results for banks in the EBA sample – on fully loaded basis results, depletion is higher than 2016.

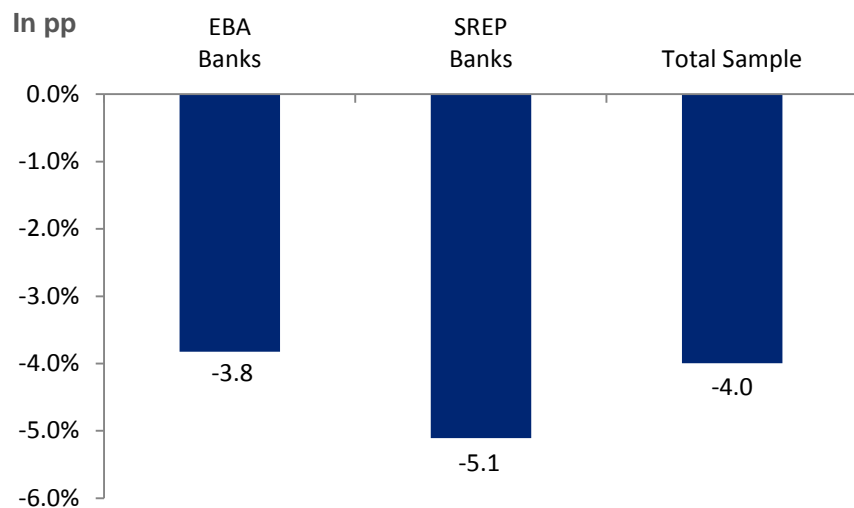
Please note that ST time horizon, methodology and scenarios vary among different exercises and are difficult to compare.

- (1) For CCAR and PRA ACS, maximum (i.e. worst year) depletion is shown
- (2) Results for PRA exclude 'strategic management actions' in order to maximise comparability to EBA ST. This increased the maximal depletion by 0.3pp to 5.5 in 2017 and 0.5pp to 4.7 in 2016.
- (3) For CCAR, severely adverse scenario was used as benchmark. Original capital action plans are used for these numbers.
- (4) The IMF FSAP sample comprised the 28 largest euro area banks, accounting for about 65 percent of consolidated banking sector assets.
- (5) PRA, CCAR, IMF exercises shown on TR basis

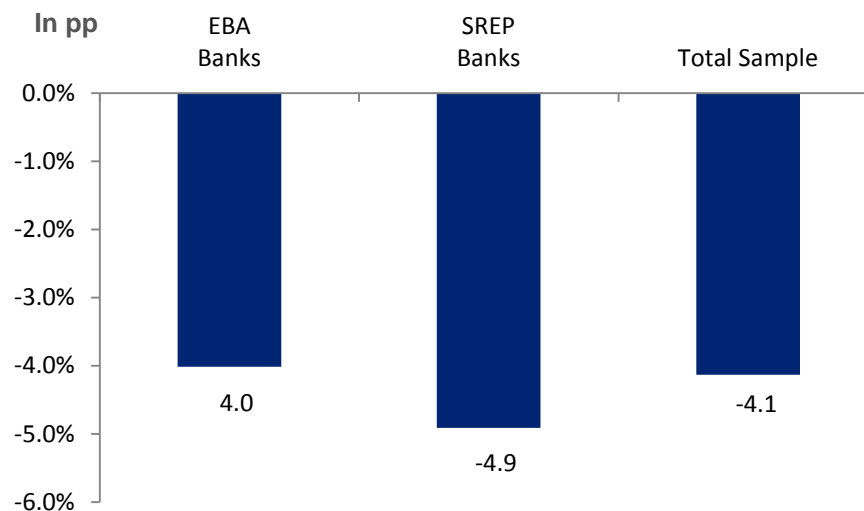
TR / FL: Transitional and fully-loaded capital ratios as per paragraph 19 of the EBA stress test methodology.

CET1R 2020-2017 depletion (Fully Loaded) stands at -3.8pp for EBA banks and at -5.1pp for SREP banks

CET1R (FL) 2020-2017 Depletion (Adverse scenario)



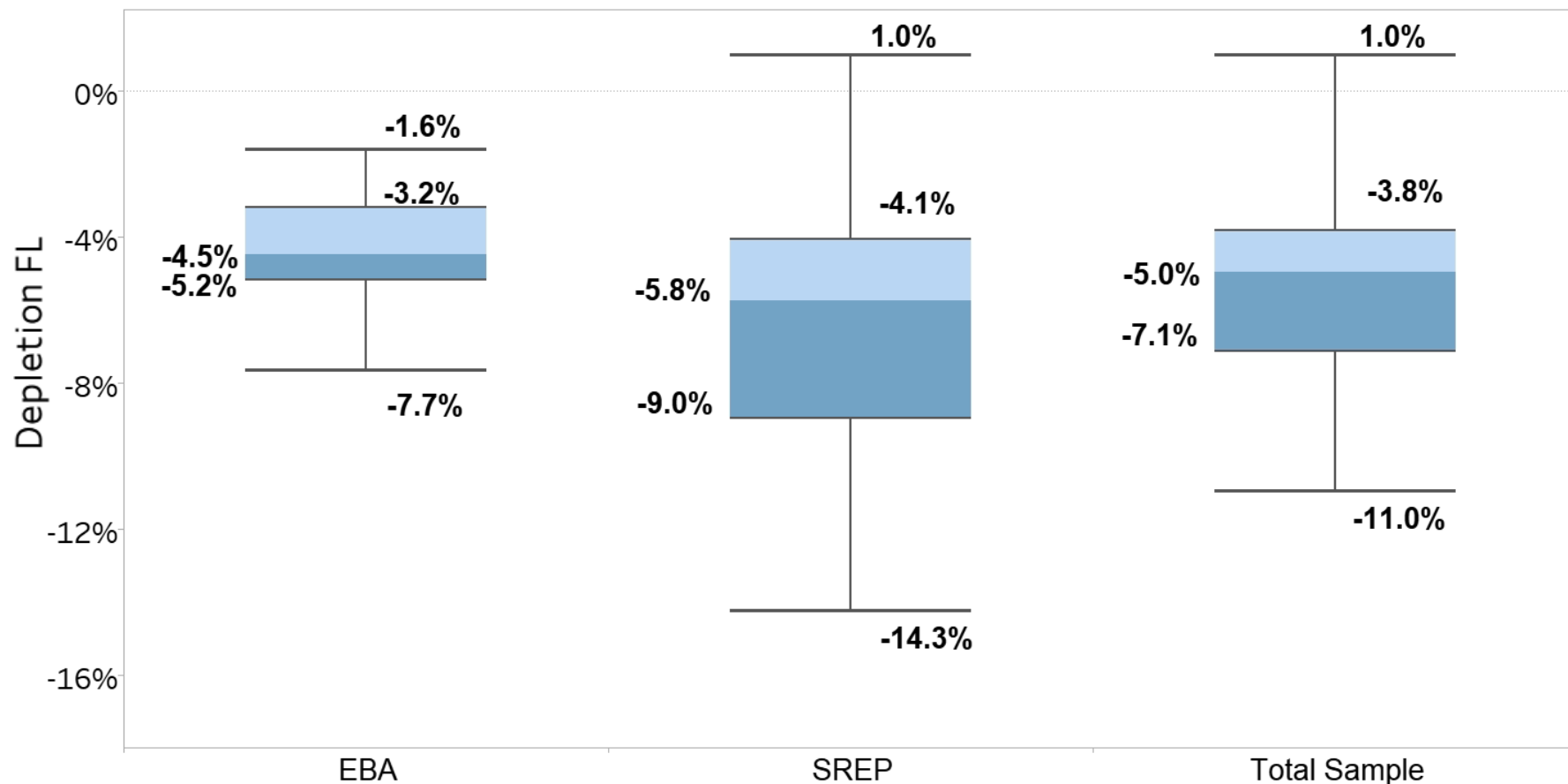
CET1R (TR) 2020-2017 Depletion (Adverse scenario)



- **EBA banks exhibit lower 2020-2017 depletion** in CET1R (TR and FL) than “SREP banks”
- **EBA banks** were **less impacted** by Market Risk (-0.8pp) than SREP banks (-1.6pp), mainly because of higher income contribution from client revenues (EBA: +0.76pp, SREP: +0.05pp) while the impact from the scenario is similar. EBA banks had a **higher contribution from NII** (2.6pp higher contribution in EBA banks FL)
- **SREP banks exhibited both higher starting and ending CET1R (TR and FL) than EBA banks** (EBA (FL): starting 13.7%, ending 9.9%; SREP (FL): starting 16.9%, ending 11.8%)
- **Compared to 2016**, the difference between EBA and SREP **has decreased** both on TR and FL basis (difference in 2016: -2.9pp; difference in 2018: -1.3pp FL); comparison includes full sample of banks in each of the 2018 and 2016 stress test exercises

CET1R (FL) depletion for SREP banks exhibits higher dispersion than EBA banks

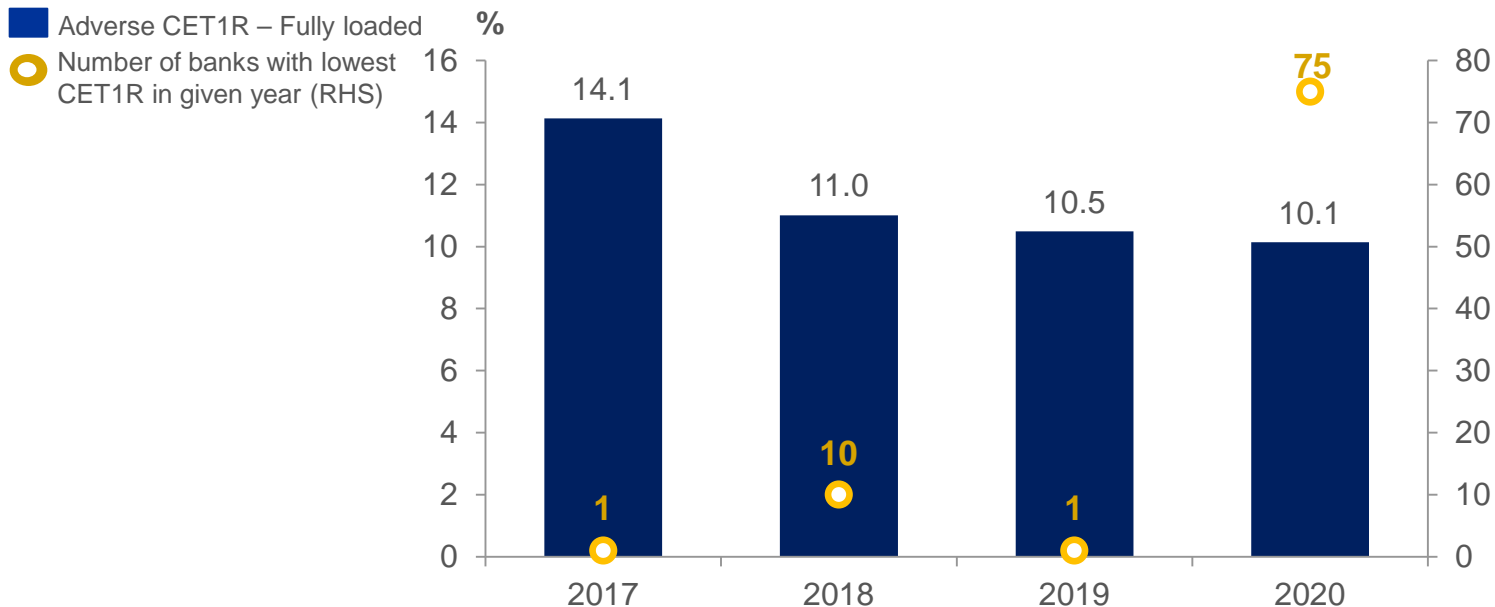
CET1R 3yr depletion – Adverse scenario (Fully Loaded)¹



¹ The boundaries of the blue areas represent the 25th, 50th and 75th percentiles, respectively. The upper whisker corresponds to the smallest (i.e. least negative or positive) observed depletion between the 75th percentile and the 75th percentile plus 1.5 times the interquartile range. The lower whisker corresponds to the largest (i.e. most negative) observed depletion between the 25th percentile and the 25th percentile minus 1.5 times the interquartile range.

Starting point to trough CET1R (FL) depletion is 4.1pp which is 8bps higher than full CET1R depletion (over 3 years)

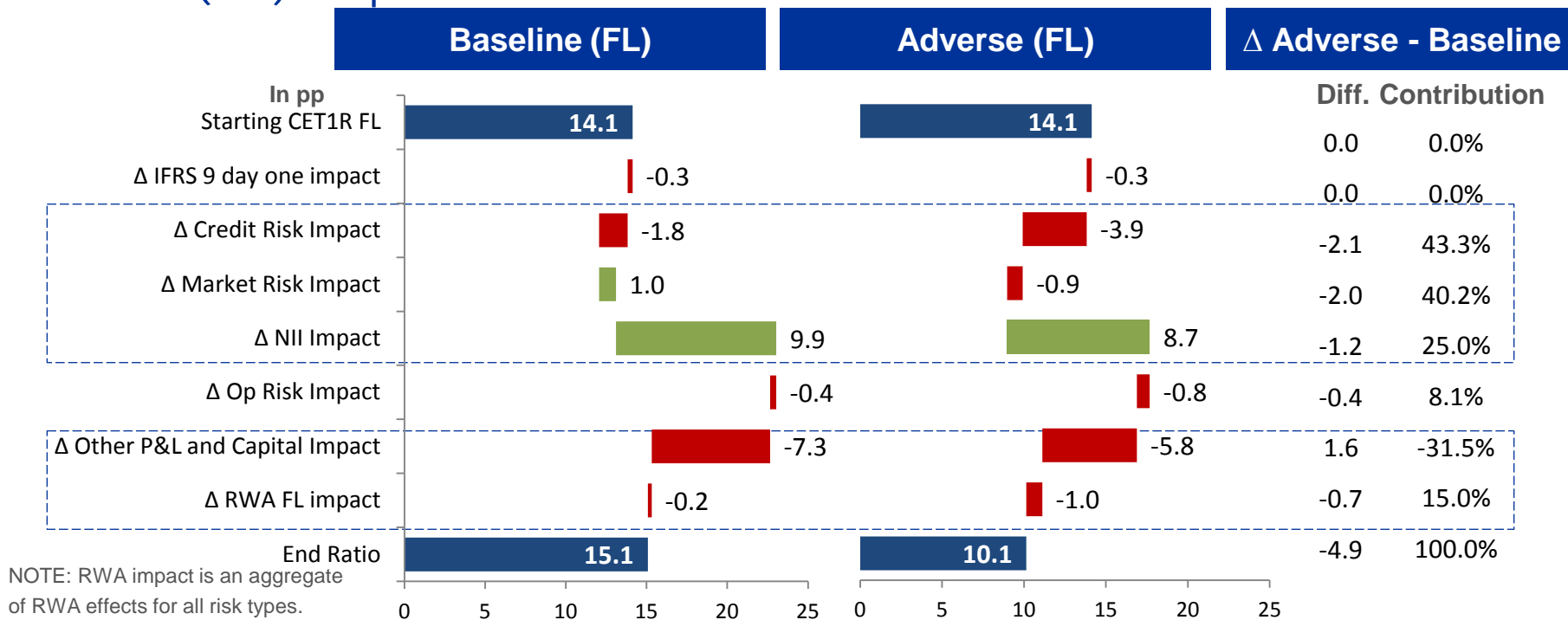
Path of average CET1R (FL)¹ and the number of banks with the lowest CET1R in the given year – Adverse scenario



- 12 banks project the lowest CET1R in the adverse scenario earlier than 2020
- This observation can largely be attributed to decreasing loan losses after first year (due to IFRS 9)
- Starting point to trough impact is 8bps (FL) higher than full depletion (CET1R₂₀₁₇ – CET1R₂₀₂₀)
- The analysis in the rest of the slide pack (unless otherwise stated) is based on 2017-2020 depletion to facilitate a comparison across banks

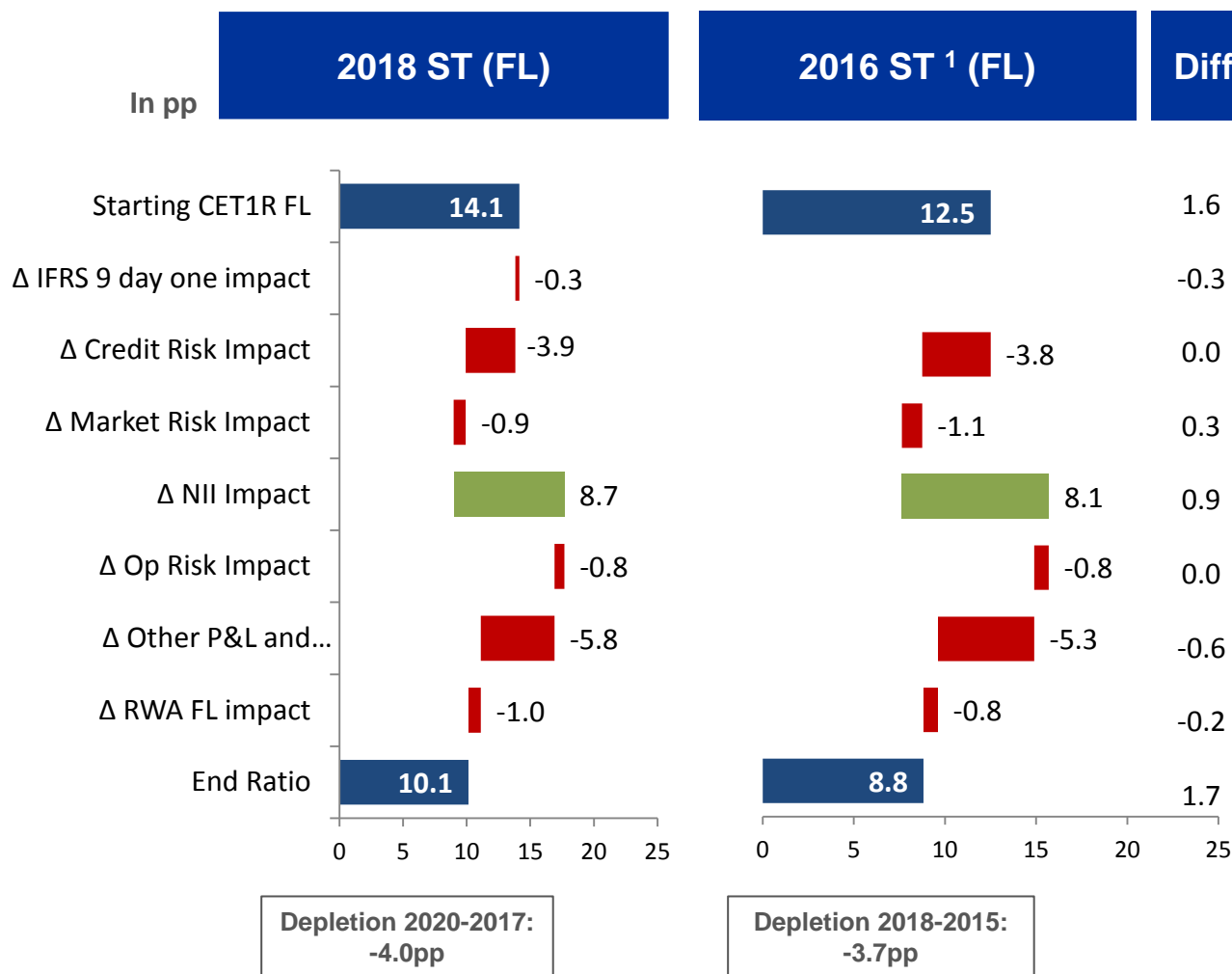
¹ Average CET1R (FL) and peak -to-trough data is calculated by weighting bank level data by total risk exposure amount as of 2017 actual

Credit Risk and Market Risk, followed by NII drive CET1R (FL) impact under adverse scenario



- The 2020 depletion relative to the starting point is **-4.0pp**; the delta between baseline to adverse scenario is **4.9pp**. The **worst year depletion is approximately 0.1pp higher than the 2020 depletion**.
- **Credit risk is the main driver for the depletion; credit risk and market risk, followed by NII**, have the largest contributions to the difference between baseline and adverse scenario which is **partially offset** by a lower impact of other P&L
- The underlying drivers mainly include the **increase in loan losses impact**, followed by the **impacts in NTI and NII**; these are only partially offset by the decrease in net tax and dividends impacts
- The decrease in other **P&L and capital impact is due to tax, MDA, and dividend benefits**

Difference to 2016 adverse depletion by risk driver



1 Starting CET1R (FL) is higher in 2018 reflecting stronger loss absorbing capacity.

2 CET1R (FL) depletion was larger in 2018 (4.0pp vs 3.7pp).

3 There is a higher contribution from NII compared to 2016. The higher depletion is mostly explained by IFRS 9 day one impact and other P&L and capital.

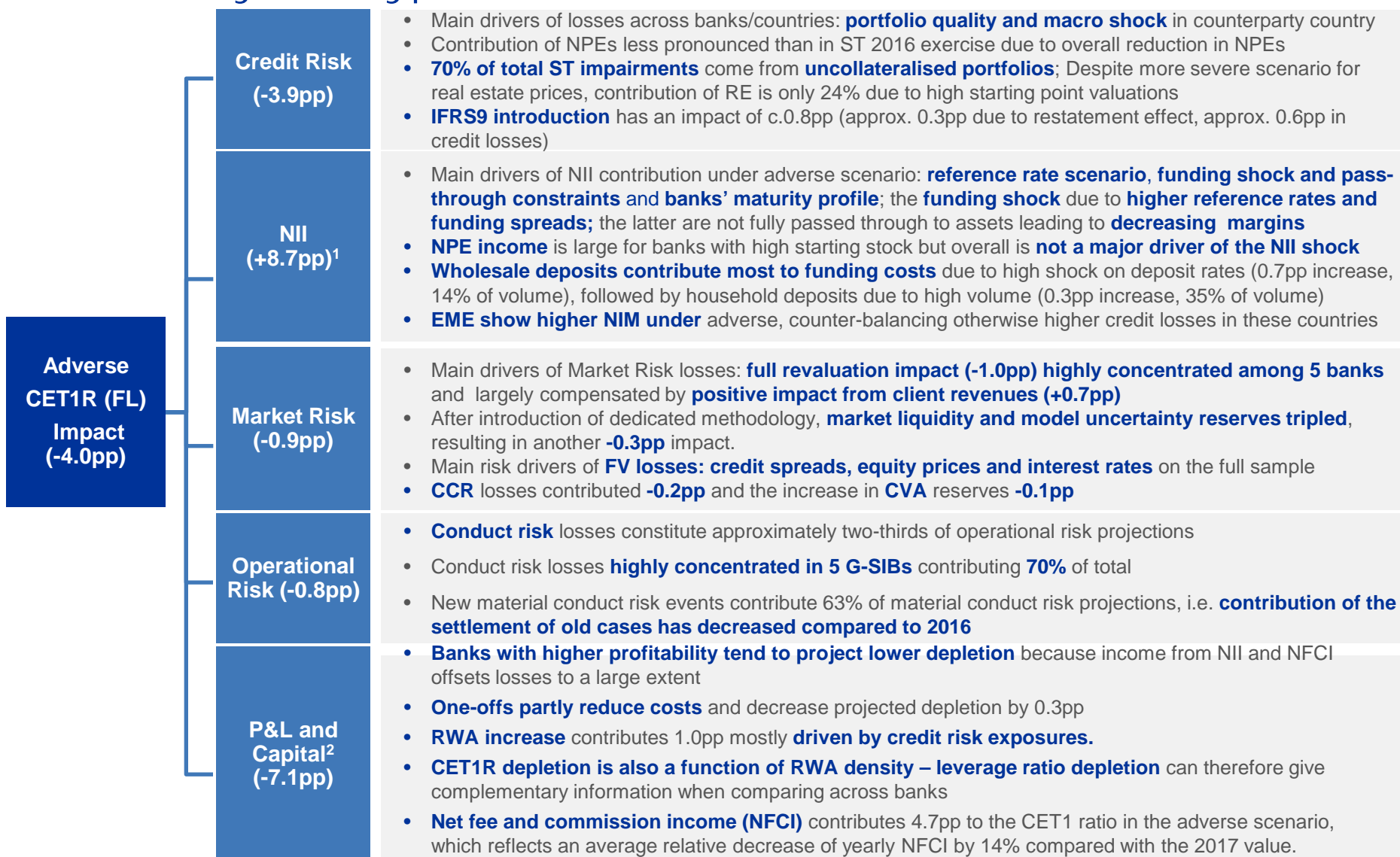
Please note that due to rounding effects numbers may not add up

¹ Please note that: Δ Credit risk impact does not include IRB shortfall, Δ Market risk impact encompasses Δ NTI impact, Δ SOV FVO impact and Δ AOCI impact; Δ Other P&L Impact encompasses Δ Other P&L Impact, CCR Impact and Δ Dividend Impact; Δ Capital impact encompasses Δ AT1 Capital impact and Net other capital impact.

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Results by risk type under adverse scenario

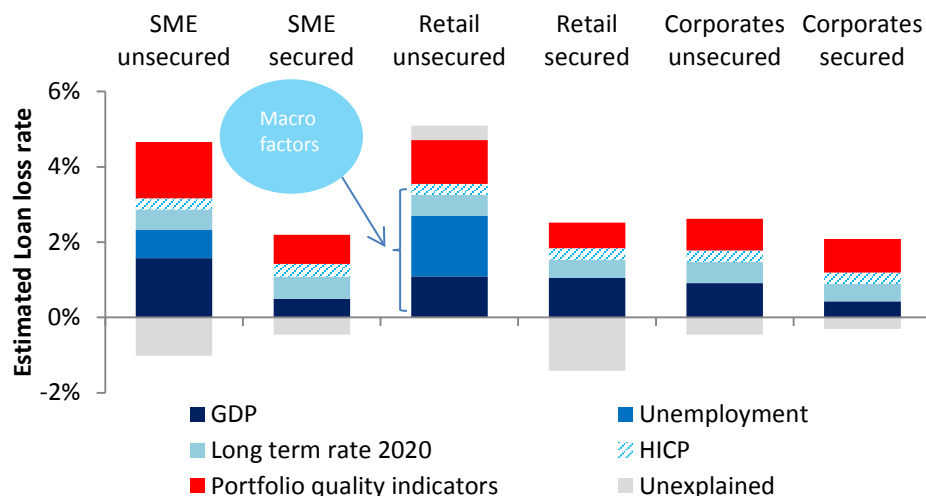


¹ Delta vs. baseline – 1.2pp

² Also includes RWA impact and IFRS 9 FTA Capital impact.

Macro drivers are the main explanatory factor for credit risk losses

Breakdown of predicted loan loss rates



Observations

- Regression results show that macro variables such as GDP shock, level of long term interest rates, increase in unemployment rates and inflation rates, and also portfolio quality indicators, such as starting point NPE rate, impairment rate in 2017 and proportion of S2 assets over performing exposure in 2018 beginning of year are highly related to projected loan losses in the adverse scenario.
- GDP impact strongly varies across asset classes: unsecured SME is the most sensitive to GDP shocks, while all secured portfolios are less sensitive. Unemployment rates are only related to projected loan losses of unsecured retail and SME portfolios.
- Long term interest rates also help in explaining loan losses: the higher the interest rate, the higher the projected loan loss.
- Portfolio quality indicators¹ are highly associated with loan losses, and the aggregate contribution in the predicted results is around half of the macro variables.

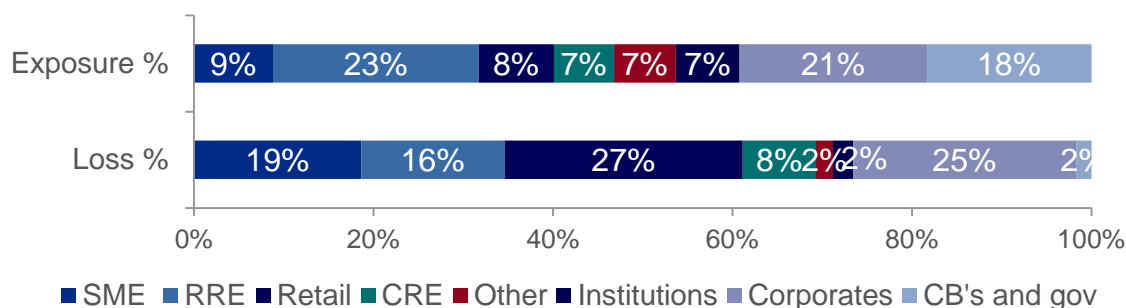
Estimation approach

- Impacts are estimated on a subset of the full sample for which all explanatory variables are available
- The relationship is estimated by OLS using asset class dummies interacted with GDP to capture different sensitivities to GDP shocks. Number of observations is close to 2000.
- Almost all the variables in the final model are significant at 1% level
- Similar model with bank fixed effects was also estimated resulting in similar coefficients and levels of significance
- The overall explanatory power of the model is limited (Adj. $R^2=0.26$) as a result of the level of granularity

1) For simplification, the portfolio quality impact is the sum of calculated impacts across the three different portfolio quality indicators.

Unsecured portfolios account for c. 70% of credit losses

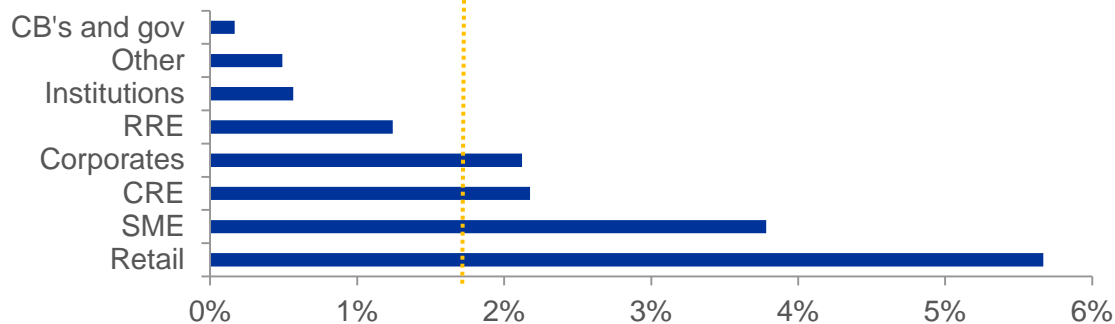
Composition of 3yr credit losses and exposures by asset class¹ (adverse)



Observations

- Banks' asset class distribution is an important driver of loan losses, as the cumulative impairment rates between asset classes differ widely
- Unsecured portfolios project significantly higher credit losses vs. secured portfolios, both in terms of actual losses (71%, from 38% of volume) and impairment rates.
- Key driver for the lower proportionality of losses in secured portfolios is the collateral buffer; despite more severe RRE and CRE price scenario vs. 2016, secured portfolio contribution to total losses is at similar levels (c. 25%).
- Retail unsecured portfolio displays the highest 3yr impairment rate, followed by SME and Corporate unsecured (orange dotted line: weighted average impairment rate)

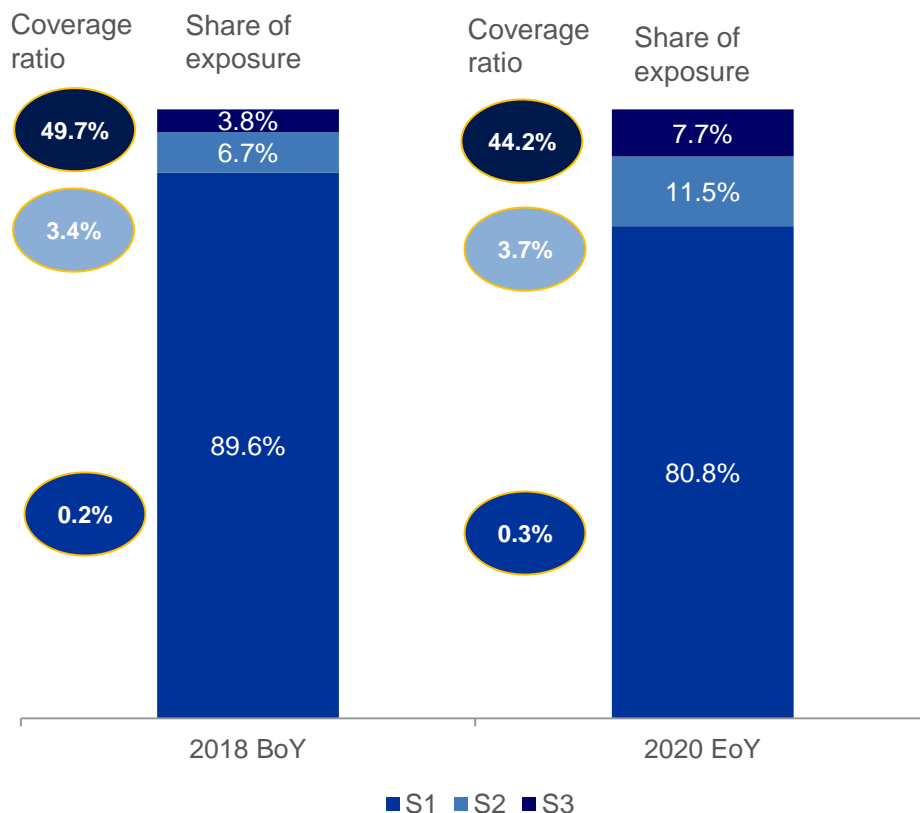
3yr impairment rate by asset class (adverse)



¹ A mapping was made to combine exposures reported under IRB and STA portfolios. Here, under CRE are all exposures to either SME or Corporates that are secured by real estate. Under RRE are exposures to non-SME or retail that are secured by real estate. Retail includes qualifying revolving and other retail (IRB) and retail non-SME (STA). Small discrepancies may occur due to the proxy character of this mapping.

The share of exposures subject to IFRS9 lifetime expected loss almost doubles in the adverse scenario

Evolution of exposure distribution by IFRS9 stages (adverse scenario) % of Total Exposure



Observations

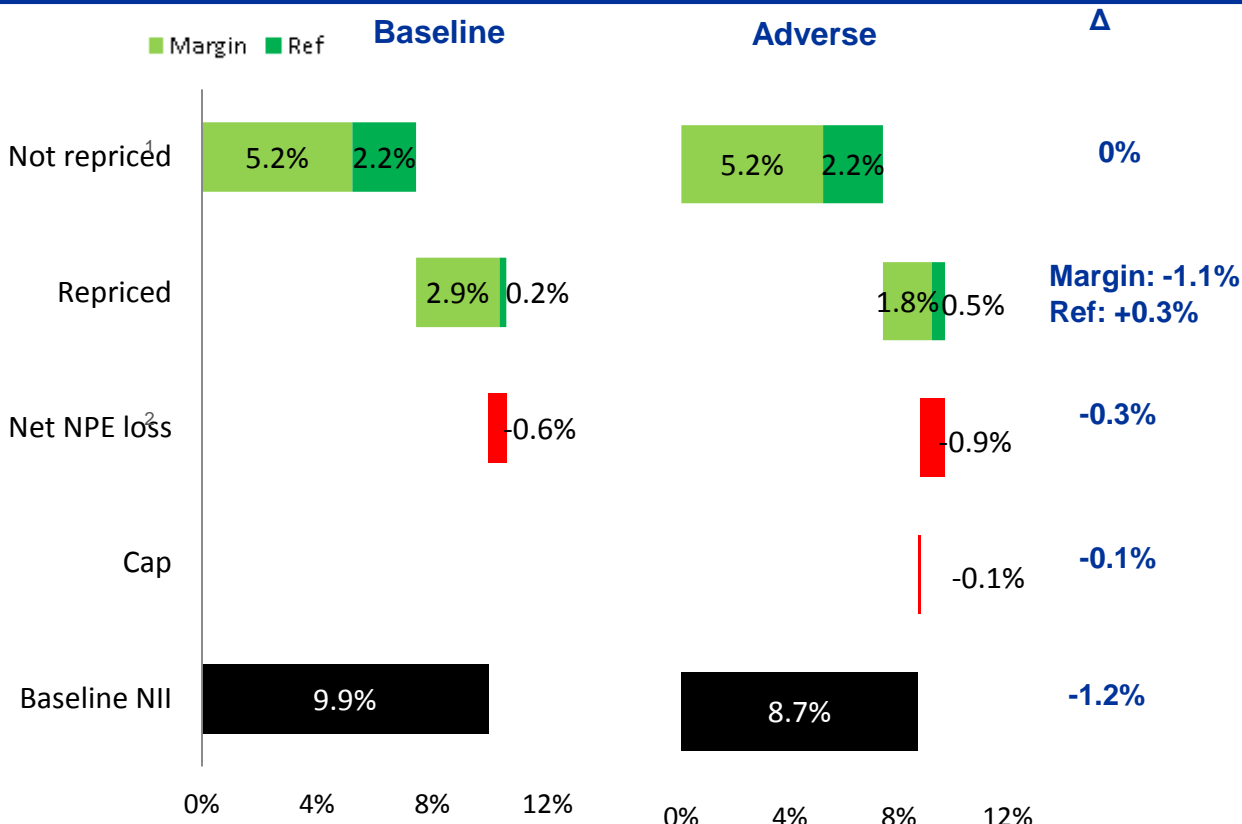
- The combined share of exposures in IFRS9 stages 2 and 3 subject to lifetime expected loss almost doubles from 10% to 19%
- S2 exposure increases by more than 70%, receiving ca. half of net S1 outflows
- S3 exposure and hence the NPE ratio more than doubles, absorbing lower quality loans from S1 and S2
- S1 and S2 coverage ratio slightly increases due to stressed loss and transition rates
- Aggregate S3 coverage ratio decrease, which can be attributed to inflow of new exposures of lower average default vintage

Note: Exposures of nGAAP banks have been allocated to stages 1 and 3 as per the EBA ST methodology. Boy/Eoy: Beginning/end of year

Limited repricing on asset and liability side mutes NII impact

NII in adverse scenario and baseline scenario in % of RWA

Observations

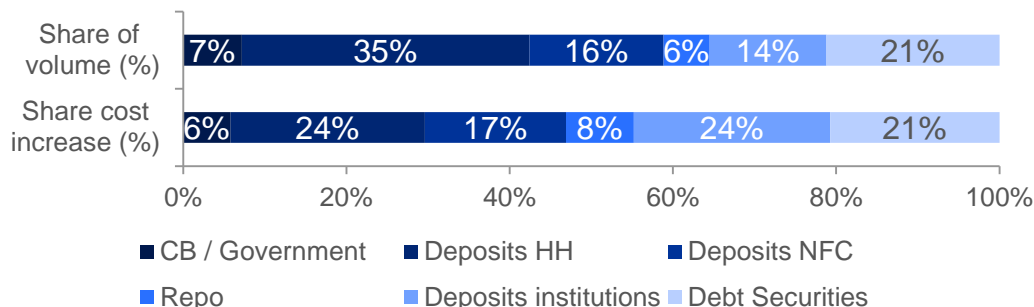


- The non-repriced portfolio is unaffected by any changes in the macroeconomic environment and is thus the same in adverse and baseline, separating the impact of defaults.
- While the margin component in the repriced portfolio is reduced in the adverse versus the baseline (due to pass-through constraints and quicker repricing of liabilities), the banks earn more on maturity transformation: long rates increase more in the adverse scenario which mostly affects assets due to longer maturities. This is reflected in the increase in earnings of the reference rate component.
- The net loss due to defaults measure, increases in the adverse scenario due to the increased propensity of defaults. The impact of this is 0.3pp.

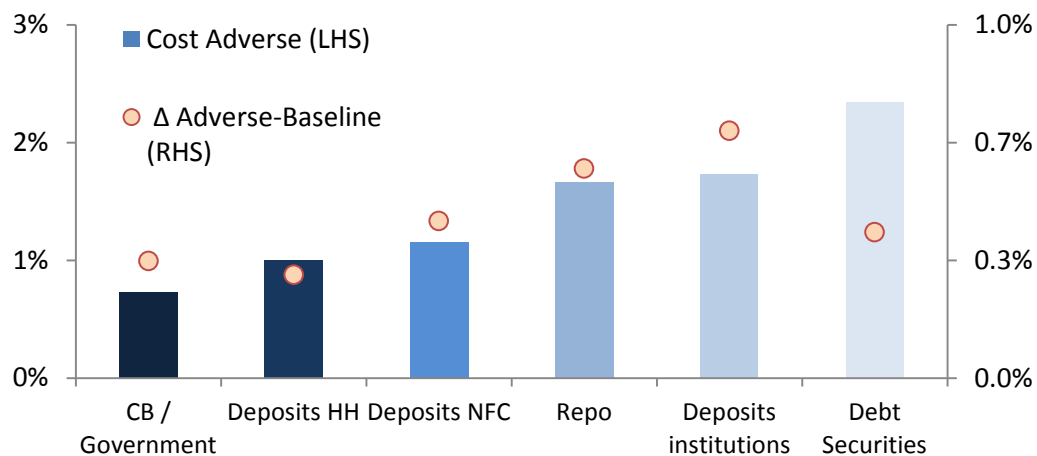
1. The not repriced category of the portfolio include all assets and liabilities that do not reprice at all during the stress period, as well as the assets and liabilities' income before their first repricing. The repriced category contains all other income and expenses. These are further split by a margin and reference rate component.
2. Net loss due to defaults is a measure of the difference between the counterfactual of the income that would have been earned had the instrument still been performing and the actual income earned on the NPE.
3. The results are qualitatively the same, irrespective of excluding derivatives.

Increase in funding cost driven by deposits

Contributions to increased funding cost, adverse to baseline scenario¹



Funding cost adverse (LHS), increase in funding cost versus baseline scenario (RHS), both in % of volume



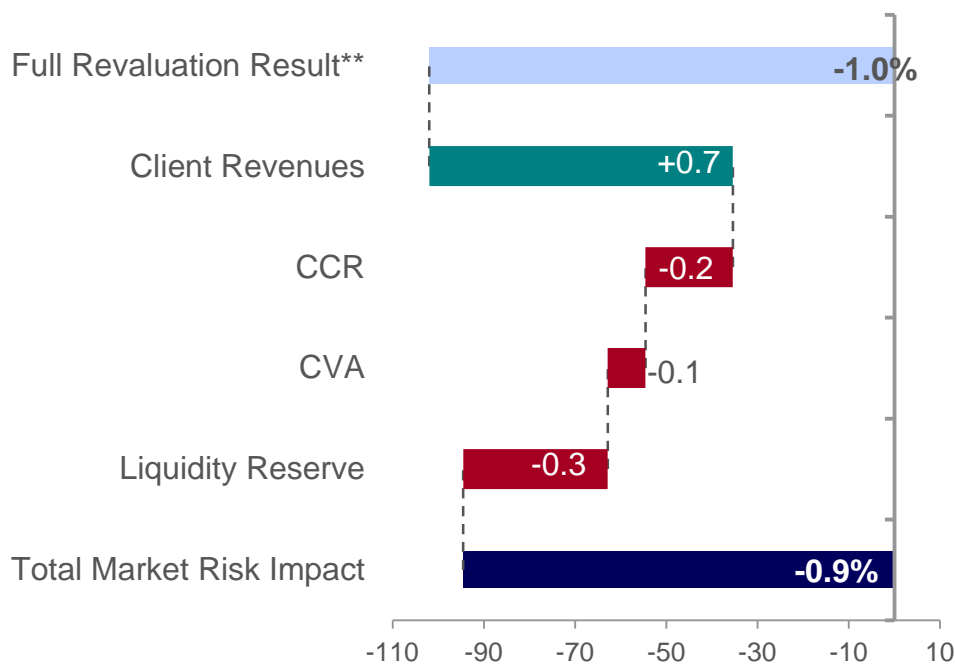
Observations

- The increase in funding costs in the adverse scenario is 6pp of RWA on an aggregate basis, compared to the baseline. Deposits of households and institutions account for the largest shares (24% resp.). However, their share of volume is very different (35% and 14% resp.).
- In general, methods of funding that are relatively expensive, also experience a greater increase in costs between the adverse and baseline scenario. A notable exception to this are debt securities, which are the most expensive way of funding in the adverse scenario while the increase in adverse-baseline is among the lowest.
- Deposits from institutions account for the largest increase in funding costs, at 0.7pp. Household deposits are the funding category that is most insulated from the adverse scenario relative to the baseline scenario, at an increase of 0.3pp. Central bank and government funding is still cheaper from the banks' perspective in absolute terms.

¹ The funding categories exclude derivatives and "other" categories of funding. Derivatives have a large impact on the cost of funding but this is compensated almost entirely on the asset side and derivatives have a very small net effect.

Largest losses coming from full revaluation followed by liquidity reserves

2018 Revaluation and Cumulative NTI adverse scenario result (EBA/SREP banks).* Total Market Risk impact



* Per-Bank impacts weighted by total 2017 RWA.

** Full Revaluation Result consists of: AOCI (-0.6pp), HfT (-0.2pp), Economic hedges excluding HfT (-0.1pp), FV through P&L (-0.1pp), Hedge accounting (< -0.1pp). Two direct capital elements driven by market risk factors – impact of pension plans and change in pension fund assets – have an impact of +0.2pp and < -0.1pp respectively and are not included in the chart.

Observations

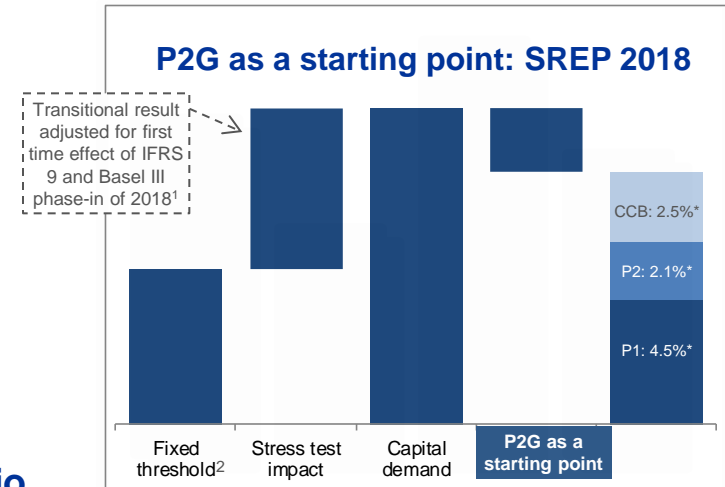
- **Market risk impact c. -0.9pp**, mostly driven by FV losses:
 - Full revaluation losses from AOCI (-0.6pp)
 - HfT (-0.2pp)
 - Economic hedges excluding HfT (-0.1pp)
 - FV through P&L (-0.1pp)
 - Hedge accounting (< -0.1pp)
- **CCR losses** add another -0.2pp
- **Liquidity reserve and CVA reserve contribute** - 0.3pp and -0.1pp respectively
- **Losses largely compensated by positive impact from client revenues** (+0.7pp)

Agenda

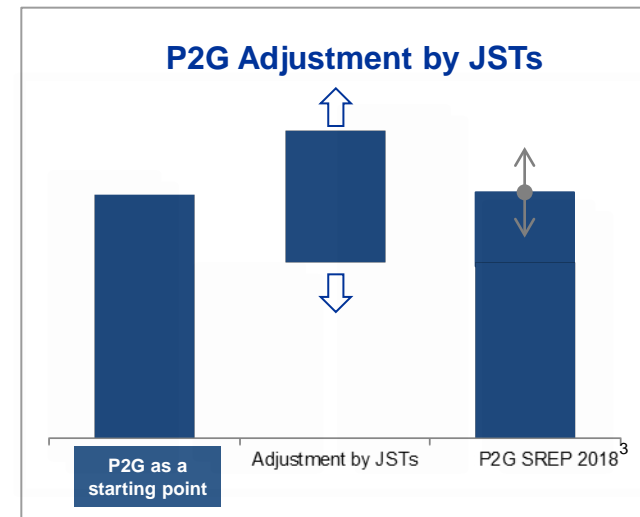
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Continuity with the 2016 methodology

- **Qualitative outcome** of the Stress Test will be **included in the determination of the P2R**, especially in the element of risk governance;
- The **stress test is not a pass/fail exercise**
- When setting P2G different elements are taken into account in a **holistic view**, for example:
 - The starting point for setting the P2G is in general the **depletion of capital** in the hypothetical **adverse scenario (quantitative outcome, see top chart on the right)**;
 - JST take the **specific risk profile** of the individual institution and its **sensitivity towards the stress scenarios into account (see bottom chart on the right)**;
 - **Also, interim changes in its risk profile** since the cut-off date (31.12.2017) and **measures taken by the bank** to mitigate risk sensitivities such as relevant sale of assets etc. are considered



* Numbers shown are illustrative examples



¹ As these effects cannot happen in the future again

² CET1 ratio of 5.5% + G-SII Buffer if applicable

³ Irrespective of the phasing-in of the CCB, banks should also expect to have positive P2G in the future.

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Key conclusions

- ✓ ECB Banking Supervision performed two supervisory stress test exercises for significant institutions in 2018.
- ✓ Stress test exercises lasted from January to October with more than 200 people involved from ECB, NCAs and NCBs. The longer timeline facilitated including the implications of the introduction of IFRS 9 at the beginning of 2018.
- ✓ ECB followed a fair and tough quality assurance approach throughout the exercise, supported for the first time by the dedicated Stress Test Account Reporting (STAR) IT infrastructure.
- ✓ Despite a higher depletion, the aggregate ending capital ratio of 10.1% CET1 after stress is higher than in 2016 with 8.8% CET1. This confirms an improved resilience of participating banks to withstand macroeconomic shocks.
- ✓ EBA published stress test results on 2 November, both an aggregate report of overall results and bank individual results.
- ✓ The results are one of the important inputs in the 2018 Supervisory Review and Evaluation Process (SREP). They are primarily reflected in Pillar 2 Guidance (P2G) (quantitative results) but can also impact Pillar 2 Requirement (P2R) (qualitative results).