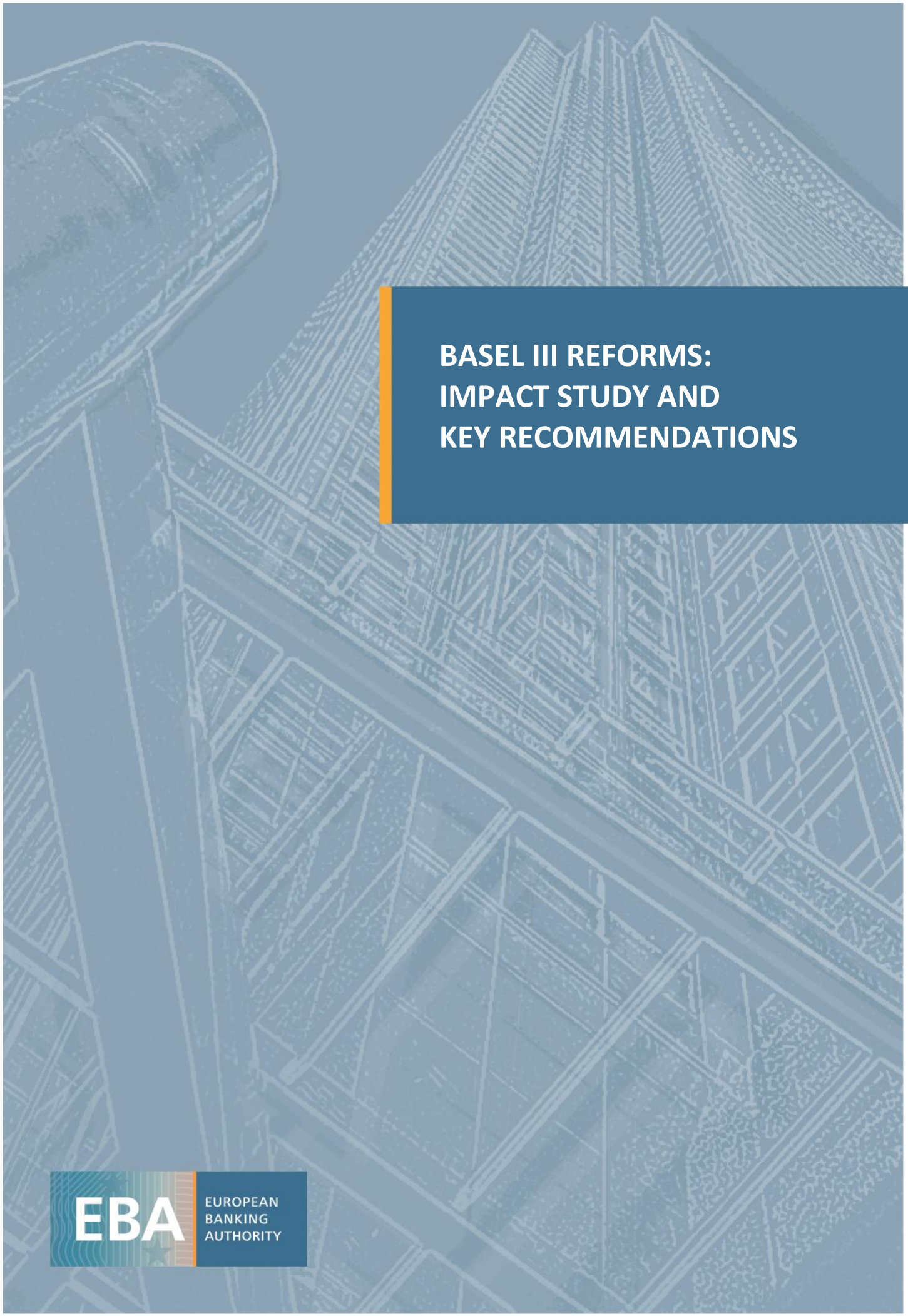

BASEL III REFORMS: IMPACT STUDY AND KEY RECOMMENDATIONS

EBA
EUROPEAN BANKING AUTHORITY

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Abbreviations

ADC	acquisition, development and construction
A-IRB	advanced internal ratings-based approach to credit risk
AMA	advanced measurement approach
BA-CVA	basic approach to CVA
BCBS	Basel Committee on Banking Supervision
BI	Business Indicator
BIA	basic indicator approach
BIC	Business Indicator Component
CCB	capital conservation buffer
CCF	credit conversion factor
CCP	central counterparty
CCYCB	countercyclical capital buffer
CET1	common equity tier 1
CfA	Call for Advice
CIU	collective investment unit
CRE	commercial real estate
CRM	credit risk mitigation
CRR	Capital Requirements Regulation
CRR2	Revised Capital Requirements Regulation
CVA	credit valuation adjustment
DA	designated authority
EAD	exposure at default
ESRB	European Systemic Risk Board
EU	European Union
F-IRB	foundation internal ratings-based approach to credit risk
FCCM(OE)	Financial Collateral Comprehensive Method (own estimates)
FCCM(SE)	Financial Collateral Comprehensive Method (supervisory estimates)
FCSM	Financial Collateral Comprehensive Method
FRTB	fundamental review of the trading book
GaR	growth-at-risk
GCRE	general commercial real estate
GHOS	Group of Governors and Heads of Supervision
G-SIIs	global systemically important institution
GRRE	general residential real estate
ICAAP	internal capital adequacy assessment process
ILM	internal loss multiplier
IMA	internal models approach
IMM	Internal Models Method
IPCRE	income-producing commercial real estate
IPRRE	income-producing residential real estate
IRB	internal ratings-based approach to credit risk
LGD	loss given default
LR	leverage ratio
LTV	loan to value ratio

MDA	minimum distributable amount
MKT	market risk
MRC	minimum required capital
OF	output floor
OP	operational risk
O-SII	other systemically important institution
PD	probability of default
p.p.	percentage points
RRE	residential real estate
RW	risk weight
RWA	risk-weighted assets
QIS	quantitative impact study
QRRE	qualified revolving retail exposures
SA	standardised approach
SA-CVA	standardised approach to CVA
SCRA	standardised rating-based approach
SEC	securititsation
SFT	securities financing transaction
SFTR	Securities Financing Transaction Regulation
SMEs	small and medium-sized enterprises
SRB	systemic risk buffer
SREP	supervisory review and evaluation process
T1	tier 1 capital
T2	tier 2 capital
TC	total capital
UCC	unconditionally cancellable commitment
ADC	acquisition, development and construction

Country code

AT	Austria
BE	Belgium
BG	Bulgaria
CY	Cyprus
CZ	Czechia
DE	Germany
DK	Denmark
EE	Estonia
ES	Spain
FI	Finland
FR	France
GB	United Kingdom
GR	Greece
HR	Croatia
HU	Hungary
IE	Ireland
IT	Italy
LT	Lithuania
LU	Luxembourg

LV	Latvia
MT	Malta
NL	Netherland
NO	Norway
PL	Poland
PT	Portugal
RO	Romania
SE	Sweden
SI	Slovenia
SK	Slovakia

Business model code

Auto & Cons	automotive and consumer credit banks
Building Soc	building societies
CCP	central counterparties
Cross-border U	cross-border universal banks
Custody	custody banks
Leasing	leasing and factoring banks
Local U	local universal banks
Merchant	merchant banks
Mortgage	mortgage banks (including pass-through financing models)
Other special	other specialised banks
Private	private banks
Public Dev	public development banks
S&L Coop	locally active savings and loan associations / cooperative banks

1. Executive summary

In December 2017 the BCBS finalised the post-crisis Basel III reforms addressing the excessive variability of RWA.

With the December 2017 agreement, the Basel Committee on Banking Supervision (BCBS) finalised the so-called Basel III framework,[1] a very comprehensive set of prudential standards. The December 2017 revisions, assessed in this report, address the excessive variability of risk-weighted assets (RWA) identified in the run up to the financial crisis by i) constraining the use of internal models; ii) increasing the risk sensitivity of the standardised approaches; iii) increasing the leverage ratio requirement for global systemically important institutions; and iv) introducing an aggregate output floor to RWA based on the standardised approaches. The December 2017 package of reforms will be phased-in from 2022 together with the revised Basel framework for market risk (the fundamental review of the trading book — FRTB) as designed in 2016 and amended in 2019. Only for the output floor is a phase-in period prescribed.

In May 2018 the European Commission requested technical advice from the EBA on the impact of these revisions.

In May 2018 the European Commission requested advice[2] from the European Banking Authority (EBA) on i) the impact of the overall package of reforms and its various components; ii) the implementation of several building blocks of the reform; iii) any information necessary to identify implementation challenges and address inconsistencies in both the current and revised regulatory frameworks.

This report presents the findings of the EBA's quantitative impact assessment analysis and summarises the main policy recommendations.

This report presents the findings of the EBA's impact assessment analysis on the various components of the reform. It also incorporates the main recommendations to the European Commission that could be assessed from a quantitative perspective, except those related to the credit valuation adjustment (CVA) and FRTB frameworks, which the EBA will assess by the end of 2019 to take due account of the 2019 BCBS updates. It is important to note that the full set of prudential recommendations and clarifications of implementation aspects, which are deemed necessary to ensure a smooth and consistent implementation of the revisions of the final Basel III framework in the European Union (EU), are included and explained in detail in policy advice reports accompanying this publication.[3]

[1] Basel Committee of Banking Supervisors (BCBS) (2017) 'Basel III: Finalising post-crisis reforms'.

[2] European Commission (2018), 'Call for Advice to the EBA for the purpose of revising the own fund requirement for credit, operational, market and credit valuation adjustment risk'.

[3] EBA (2019), 'Policy advice on the Basel III reforms: credit risk'; EBA (2019), 'Policy advice on the Basel III reforms: securities financing transactions (SFTs)'; EBA (2019), 'Policy advice on the Basel III reforms: operational risk'; EBA (2019), 'Policy advice on the Basel III reforms: output floor'.

1.1 Overall impact and key assumptions

Under conservative assumptions, minimum required total capital increases by 24.4%, including Pillar 2 and macroprudential buffers.

Under conservative assumptions, at its steady-state implementation scheduled for 2027, the reform could increase the tier 1 (T1) minimum required capital (MRC) amount, which includes Pillar 2 requirements and EU-specific buffers, by 24.4% with respect to the June 2018 baseline. The output floor (+9.1%) is the main driver of impact, whereas CVA (+3.9%) and operational risk (+3.3%) are the second and third most important drivers, respectively (Table 1). The impact is also partially driven by the removal of the EU-specific policies that do not exist in the Basel framework: small and medium-sized enterprise (SME) supporting factor and CVA exemptions. The results are based on a sample of 189 banks[4] from 19 EU countries.

The impact would determine a EUR 135.1 billion shortfall in total capital, of which EUR 91.1 billion of CET1.

The impact would reduce the average total capital ratio of the banks in the sample from 17.9% to 14.3% and determine a shortfall in total capital of EUR 135.1 billion, of which EUR 91.1 billion common equity tier 1 (CET1). Based on 2014-2018 average annual profits and assuming banks retain profits during the transitional period to rebuild their capital base, only EUR 58.7 billion of the shortfall in total capital (EUR 40.6 billion in terms of CET1) will actually materialise in 2027. This shortfall is mostly borne by institutions that did not make any profits between 2014-2018.

The impact of the output floor is assessed by computing the full stack of capital requirements applicable in the EU on the basis of the floored RWA. At the 2027 steady-state implementation of the reform, the output floor is expected to constrain 40 out of 79 internal model banks, which account for around 70% of internally-modelled RWA in the sample.

Calculations are based on several assumptions, leading to potential overestimation of the impact.

Several assumptions had to be made to carry out the quantitative impact assessment, all leading to the potential overestimation of the impact. First, the exercise assumes static balance sheets, so that banks do not adjust their business in reaction to the new requirements. Second, the analysis also assumes that Pillar 2 and combined buffer requirements as of June 2018, defined as a percentage of the bank's RWA, are used both for the baseline and for the 2027 scenarios. Third, the report measures the impact of the 2016 FRTB framework, disregarding the revisions to the FRTB that the BCBS agreed in January 2019, which are expected to have a lower impact. Taken together, these assumptions amount to a scenario of a strict implementation of the final Basel III framework. Finally, information reported by banks in quantitative impact studies such as the present one tends to err on the conservative

[4] In this report, the terms 'banks' and 'institutions' are used interchangeably.

side, particularly when banks are asked to estimate the impact of completely new pieces of regulation.

After excluding Pillar 2 and EU-specific buffers, results are comparable and consistent with the EBA regular Basel monitoring exercise: T1 MRC will drop to around 18% and the total capital shortfall to around EUR 40 billion.

The inclusion of Pillar 2 and EU-specific buffers makes the findings of this report incomparable with those of the regular Basel III monitoring exercises carried out by the EBA. When Pillar 2 and EU-specific buffers are excluded from the computation of the capital requirement, the overall impact of the reform on the sample considered in this report is lower. In this case, the average increase in T1 MRC will drop to around 18% and the total capital shortfall to around EUR 40 billion. This impact is consistent with the one published by the EBA in March 2019 in the context of the regular EBA Basel III monitoring exercise.

1.2 Impact by bank size, business model and risk type

The impact is largely driven by large and systemically important institutions, while it is limited for medium and small sized banks.

The reform has a materially higher impact on large and systemically important institutions than on medium-sized and small ones. On average, medium-sized and small banks see their capital requirements increase from the baseline levels by 11.3% and 5.5% respectively (Table 1). These banks see their capital requirements increase mostly due to the revised standardised approach to credit risk, with other reforms, including the output floor, playing a minor role. Finally, a non-negligible number of banks in the sample will see their overall capital requirements fall from their current levels, mostly due to the changes in the standardised approach and in the operational risk framework. The shortfall in total capital is almost exclusively reported by large banks, with G-SIIs alone accounting for 60% of its total amount.

Table 1 Percentage change in T1 MRC (relative to current T1 MRC), by bank size

Bank size	Δ SA	Δ IRB	Δ CCP	Δ SEC	Δ MKT	Δ OP	Δ CVA	Δ LR	Δ OF	Δ Total
All banks	**2.7**	**2.7**	**0.1**	**0.6**	**2.5**	**3.3**	**3.9**	**-0.5**	**9.1**	**24.4**
Large	2.3	2.8	0.1	0.7	2.6	3.4	4.1	-0.5	9.5	25.0
of which: G-SIIs	1.7	3.5	-0.1	1.2	4.2	5.5	5.1	0.0	7.6	28.6
of which: O-SIIs	2.3	1.7	0.2	0.3	1.6	2.1	3.7	-0.5	12.1	23.6
Medium	9.7	0.1	0.0	0.0	0.9	0.3	0.5	-1.1	0.9	11.3
Small	10.7	0.0	0.2	-1.9	0.0	-3.7	0.3	-0.1	0.0	5.5

Sources: EBA 2018-Q2 quantitative impact study (QIS) data and EBA calculations.
Notes: Based on a sample of 189 banks: Large (104), of which G-SII (8), of which O-SII (67); Medium (61); Small (24). SA, standardised approach to credit risk; IRB, internal rating-based approach to credit risk; CCP, central counterparty; SEC, securitisation; MKT, market risk; OP, operational risk; CVA, credit valuation adjustment; LR, leverage ratio; OF, output floor.

Table 2 Capital ratios and shortfalls, by bank size

Bank size	CET1 capital			Tier 1 capital			Total capital		
	Current ratio (%)	Revised ratio (%)	Shortfall (EUR bn)	Current ratio (%)	Revised ratio (%)	Shortfall (EUR bn)	Current ratio (%)	Revised ratio (%)	Shortfall (EUR bn)
All banks	**14.4**	**11.5**	**91.1**	**15.3**	**12.3**	**127.5**	**17.9**	**14.3**	**135.1**
Large	14.2	11.4	91.0	15.2	12.2	126.8	17.8	14.2	134.1
of which: G-SIIs	12.7	9.9	53.5	13.8	10.8	69.0	16.2	12.7	82.8
of which: O-SIIs	15.4	12.5	33.6	16.3	13.2	51.5	19.2	15.6	43.8
Medium	17.4	15.2	0.1	17.6	15.4	0.8	19.0	16.6	0.9
Small	17.0	16.0	0.0	17.2	16.1	0.0	18.3	17.1	0.1

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Notes: Based on a sample of 189 banks: Large (104), of which G-SII (8), of which O-SII (67); Medium (61); Small (24). Tier 1 and total capital shortfalls include the shortfall incurred by institutions constrained by the leverage ratio in the revised framework.

Cross-border and local universal banks, together with mortgage banks, experience the highest increase in capital requirements.

The impact of the reform also differs between bank business models. Cross-border and local universal banks, together with mortgage banks, experience the highest increase in capital requirements (20%-25%) and report the output floor as the single most important driver of the impact. These are also the business models that — on average in the EU — have 50% or more of their credit risk exposures treated under internal models. The standardised approach to credit risk is the main driver of impact for other specialised banks, building societies, savings and loans associations and cooperative banks, as well as private banks. The overall average impact of the reform is very low for automotive and consumer credit banks and slightly negative for custody and merchant banks.

Capital increases reflect the rationale of the reform and mostly affect riskier exposures identified by the reform.

The analysis of the impact at the level of individual risk categories shows that, reflecting the intentions of the standards setter, capital requirements will tighten the most in those areas of the prudential framework where new categories of exposures of riskier nature were identified (e.g. equity and income-producing real estate under the standardised approach) and where new constraints to the use of internal models were introduced.

Within the area of SA to credit risk, most of the impact comes from equity investment in funds, equity, subordinated debt and banks.

The reform of the standardised approach (SA) to credit risk increases the granularity of risk weights across several exposure classes, improving the overall risk sensitivity of the approach. The tightening of requirements is more material for exposures to equity investment in funds, equity, subordinated debt and banks (the latter due to risk differentiation among unrated exposures). Within other exposure classes, specific portfolios experience material increases in requirements. This is the case for exposures secured by commercial real estate and exposures secured by income-producing (both residential and commercial) real estate, for which the revised framework introduces more conservative ad hoc treatments reflecting the fact that the prospects of repayment and recovery depend primarily on the cash flows

generated by the real estate. Similarly, in specialised lending, exposures to project finance in the pre-operational phase receive the highest risk weight to account for construction risk.

In the area of IRB in credit risk, requirements increase as a result of the restrictions to the use of the advanced approach, while requirements for F-IRB go down.

In the area of the internal ratings-based (IRB) approach to credit risk, requirements will increase for exposures currently treated under the advanced IRB approach (A-IRB), slightly decrease for those currently treated under the foundation IRB approach (F-IRB) and decrease for exposures to equity. Within the current scope of the A-IRB approach, the most affected regulatory portfolios are: i) banks and financial institutions treated as corporates, which bear the cost of the restriction of loss given default (LGD) modelling and the newly introduced input floors; and ii) specialised lending, which is mostly affected by the new input floors. As regards current F-IRB approach portfolios, the general decrease in RWA mostly reflects the introduction of lower supervisory LGD parameters.[5]

As regards CVA, a significant increase of capital requirements is due to removal of EU exemptions.

As regards CVA risk, a significant increase in capital requirements would be associated with discontinuing the EU-specific CVA exemptions, once the final Basel III framework comes into place. The impact of the final Basel III framework to the CVA framework is found to be material but not comparable with that of discontinuing the exemptions.

Capital requirements for market risk should be reassessed once data on 2019 FRTB are available.

In the area of market risk, capital requirements under both the standardised and internal model approaches would approximately double under the 2016 FRTB framework. However, the actual impact of the reform is expected to be lower as a result of the 2019 revisions to the FRTB, which could not be assessed in this report.

Operational risk impact is driven by the historical loss component and affects mostly large banks.

With regard to operational risk, the increase in capital requirements is expected to be almost exclusively borne by large and systemically important institutions, in particular by those banks that adopt internal models and the standardised approach in the current framework. The bank-specific historical loss component of the newly designed operational risk framework is an important driver of the measured average impact.

IT and staff costs are considered the most material operational burden in implementing the new framework.

Apart from the impact on capital, banks were asked to assess the operational and administrative costs of implementing the reform as part of a supplementary qualitative survey. The reforms related to the standardised approach to credit risk, CVA risk and output floor appear to be the most challenging to implement. On the other hand, securities financing transactions (SFTs) and operational risk appear to be the least challenging to implement. The standardised approach to credit risk, CVA risk and output floor are also the areas where banks are expected to incur the highest

[5] Equity exposures experience RWA relief because the new SA risk weights, which in the revised framework become the only allowed approach to equity, are on average lower than those applicable under the simple risk weight approach, which is the most widely used approach for equity under the current IRB framework.

one-off implementation costs. The most prominent one-off costs are expected to be on IT and staff costs, while infrastructure (premises, rent, etc.) and other costs appear to be low or negligible. In terms of recurring costs, most banks expect low or negligible costs for all risk categories.

1.3 Impact under alternative scenarios

Alternative scenarios for some of the Basel provisions limit the impact for the specific risk type, but the benefit is partially offset by the output floor.

The impact analysis is based on a central reform scenario in which the main current EU-specific deviations from the Basel framework (e.g. SME supporting factor, CVA exemptions) are discontinued and Basel jurisdictional discretions closest to the current capital requirements regulation (CRR)[6] are exercised. The Call for Advice, however, also required the EBA to assess alternative implementation scenarios, by maintaining the EU-specific deviations from Basel or exercising supervisory discretions differently. Overall, using alternative scenarios tends to change the MRC impact for the specific risk type. This change is then partially offset by the output floor, which becomes more binding as risk-based requirements become less constraining or the other way around.

Including an SME supporting factor in the revised rules would lead to a decline of total impact by 1.5 p.p.

Acknowledging the preferential treatment for certain SME exposures introduced with the December 2017 reform, the central reform scenario does not include any additional form of capital discount for SME exposures, which is an EU deviation from the BCBS agreement. The implementation of the SME supporting factor as specified in the November 2016 proposal for amending the CRR (CRR2)[7], on top of the SME preferential risk weight treatment introduced with the reform, would lead to a decline of 1.5 percentage points (p.p.) in the total impact (Table 3).

Excluding the historical loss component reduces total impact by 1.2 p.p. on average, but with asymmetric impacts across banks.

Exercising the jurisdictional discretion to exclude the bank-specific historical loss component from the calculation of the capital for operational risk would reduce the average impact by 1.2 percentage points (Table 3), increasing the requirement for some banks and decreasing it for others.

Keeping CVA exemptions would reduce total impact by 2.4 p.p.

The bulk of the CVA impact would stem from removing the exemptions from the CVA requirement that currently characterise the EU regulatory framework and that are not included in the new final Basel III framework. If the EU-specific exemptions were included in the implementation of the package, the total impact would decline by 2.4 p.p. (Table 3).

[6] Regulation (EU) No 575/2013 of the European Parliament and of the Council of 26 June 2013 on prudential requirements for credit institutions and investment firms and amending Regulation (EU) No 648/2012.

[7] Proposal for a regulation of the European Parliament and of the Council amending Regulation (EU) No 575/2013 from 23 November 2016.

Estimates of FRTB 2019 suggest that it could lower the market risk impact

The market risk reform assessed in this report follows the FRTB standards published by the BCBS in January 2016. The 2019 revisions to the FRTB agreed by the BCBS are expected to dampen the impact of the framework. Proxy calculations show that the impact could be lowered by up to almost a half based on assumptions and total impact will be reduced by 0.5 p.p. (Table 3).

Table 3 Percentage change in T1 MRC (relative to current T1 MRC) and total capital shortfall under alternative implementation scenarios

Scenario	T1 MRC change (%)										TC shortfall (EUR bn)
	Δ SA	Δ IRB	Δ CCP	Δ SEC	Δ MKT	Δ OP	Δ CVA	Δ LR	Δ OF	Δ Total	
Central scenario	2.7	2.7	0.1	0.6	2.5	3.3	3.9	-0.5	9.1	**24.4**	**135.1**
CRR2 SME supporting factor	2.0	1.8	0.1	0.6	2.5	3.3	3.9	-0.4	9.2	**22.9**	**128.3**
ILM = 1	2.7	2.7	0.1	0.6	2.5	1.6	4.0	-0.5	9.5	**23.2**	**122.8**
CVA exemptions	2.7	2.7	0.1	0.6	2.5	3.3	1.1	-0.4	9.5	**22.0**	**116.9**
FRTB 2019 proxy	2.7	2.7	0.1	0.6	1.4	3.3	3.9	-0.5	9.7	**23.9**	**130.9**

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Notes: Based on a sample of 189 banks. SA, standardised approach to credit risk; IRB, internal ratings-based approach to credit risk; CCP, central counterparty; SEC, securitisation; MKT, market risk; OP, operational risk; CVA, credit valuation adjustment, LR, leverage ratio; OF, output floor; TC, total capital.

1.4 Main policy recommendations

International standards are the foundation of a well-functioning global banking market.

International standards are the foundation of a well-functioning global banking market. By addressing the problem of undue RWA variability, the December 2017 reforms help restore the credibility of the international regulatory framework based on internal models, allowing large and internationally active banks to operate across borders within conditions of regulatory certainty and on the basis of a level playing field, from a regulatory perspective. Specific reforms included in the package, such as the preferential treatment of certain exposures to SMEs, the introduction of a bespoke treatment for covered bonds and the introduction of the loan-splitting approach for real estate, make the revised international prudential framework more aligned with regulatory treatments that have so far been core specificities of the European framework.

The EU banking sector will enhance credibility by applying the final Basel III framework in full, without deviations.

Against this backdrop, the credibility benefit the EU banking sector will derive from strictly complying with the framework far outweighs, in the view of the EBA, the overall limited regulatory capital gains assessed in this report in relation to keeping certain EU deviations in the implementation of the final Basel III framework. In this vein, the EBA is of the view that the overall package of revisions to the Basel capital framework agreed upon in December 2017 should be transposed into European legislation in accordance with the implementation calendar set out under that agreement.

In the area of credit risk, the newly agreed revisions should be implemented in the EU as explained in the policy advice reports

In the area of credit risk, the EBA recommends that all the newly agreed revisions should be implemented in the EU, with minor exceptions further explained in the report and accompanying risk-specific reports. As regards the main policy discretions envisaged by the final Basel III framework in the area of the standardised approach, the EBA recommends i) keeping the external ratings-based approach across exposure classes, as this results in a more risk-sensitive regulatory treatment, particularly in light of the increased risk sensitivity of the new SA framework as well as the broader EU regulatory efforts to improve the reliability and governance of external ratings; ii) adopting the loan-splitting approach to exposures secured by real estate that are not of the income producing type, as this is deemed more risk sensitive than the whole loan approach in relation to the riskiness of the borrower. In addition, on the basis of the European experience on the performance of real estate markets, the EBA recommends adopting the hard test for exposures secured by both residential and commercial real estate of the income producing type.

Acknowledging the reduction of risk weights introduced in the final Basel III framework, the EU legislator is recommended to not adopt any EU-specific supporting factors to SME and infrastructure lending exposures when implementing the final Basel III framework.

Given the recognition of a preferential risk weight treatment for certain SA exposures to corporate SMEs and to high quality project finance within the revised Basel framework, the EBA is of the view that the EU legislator should not adopt any EU-specific supporting factors to SME and infrastructure lending exposures when implementing the final Basel III framework. The EBA also recommends keeping the existing EU exemption from the own funds deduction of equity exposures to intra-group insurance holdings, intra-group holdings and holdings and intra-group exposures to institutions that are part of the same institutional protection scheme (Article 49(4) of the CRR). The newly set SA risk weights for equity exposures, higher and more diversified than the ones applied in the current framework, are deemed an appropriate prudential treatment for these types of investments, making the own funds deduction treatment unnecessary and potentially disruptive vis-à-vis current structures of the EU banking market.

Reforms on exposure values of counterparty credit risk exposures from SFTs should be implemented, with the exception of the newly defined minimum haircut floors framework.

The EBA supports the introduction of the Basel III reforms affecting the calculation of exposure values of counterparty credit risk exposures stemming from SFTs. The newly defined minimum haircut floors framework in the EBA's view should be put on hold and more carefully assessed in the context of financial markets regulation.

The EBA recommends the adoption of the newly designed standardised approach to operational

In the area of operational risk, the EBA recommends the adoption of the newly designed standardised approach, replacing all currently existing regulatory approaches to operational risk capital. The EBA's analysis finds that historical operational losses can usefully predict

risk, and not setting the historical operational losses multiplier to 1.

future operational losses, that the capital requirement based on bank-specific historical losses performs better when it comes to covering realised losses, and that the historical loss component is not a major source of volatility in the requirement. In addition, the EBA is of the view that establishing a close link between regulatory capital and bank-specific historical loss performance will have a positive impact on risk management incentives. On this basis, the EBA recommends that the national discretion to set to 1 (neutralize) the internal loss multiplier for banks of Business Indicator (BI) buckets 2 and 3 is not exercised. The EBA is also in favour of i) allowing individual BI bucket 1 banks to request permission to adopt a bank-specific historical loss component in the calculation of the operational risk requirement and ii) allowing supervisors to increase the loss data threshold up to EUR 100 000 for bucket 2 and 3 banks. These two discretions should be exercised under specific conditions and within a level 2 framework that the EBA intends to define at a later stage. Finally, the EBA supports the gradual phase-in of the loss component of the new operational risk rules.

The EBA will elaborate on policy recommendation for market risk and CVA with the publication of an assessment of the 2019 revisions to the FRTB.

As regards market risk and CVA, the EBA will further elaborate on policy recommendations when publishing an assessment of the 2019 revisions to the FRTB, based on December 2018 quantitative impact study (QIS) data.

The EU prudential ratios should be based on floored RWA.

Banks should use floored RWA to compute the full stack of capital requirements applicable in the EU, including Pillar 2 requirements and EU-specific systemic buffers. Competent authorities and authorities in charge of macroprudential requirements should consider the appropriate level of Pillar 2 requirements to ensure that these amounts take due account of the new output floor requirements as well as the appropriate level of the systemic risk buffer (SRB) rate(s) for output floor-constrained institutions, avoiding overlap in objectives between the macroprudential measure and the output floor.

The output floor should be applied at all levels of consolidation.

The output floor, like any other component of the capital requirement, should be applied at all levels of consolidation, unless waivers are granted to individual level capital requirement. Such an approach is in line with the CRR, in which all the existing capital requirements are applied at individual level, including the leverage ratio, which, like the output floor, is a type of backstop measure. A decision to apply the output floor only at a consolidated level would therefore represent a departure from the current application of capital requirements in the EU. An application of the output floor solely at consolidated level could result in economic risks present at individual level from being underestimated and not sufficiently covered by appropriate capital requirements.

The EBA stands ready to further assist the European Commission on the implementation in the EU of the final Basel III reforms.

The EBA stands ready to further assist the European Commission in relation to preparing the transposition and implementation in the EU of the package of reforms assessed in this report. Level 2 regulation will be a crucial step in ensuring that the agreed international reforms fully contribute to the resilience of the EU banking sector, restoring regulatory certainty in the post-crisis environment.

2. General remarks

2.1 Background and mandate

1. On 7 December 2017, the Group of Governors and Heads of Supervision (GHOS) endorsed a package of amendments aimed at finalising the Basel III framework, the internationally agreed prudential standards for banks developed by the BCBS adopted in the wake of the financial crisis.

2. The agreement modifies prudential standards across several risk areas, with the overall objective of increasing the risk sensitivity of standardised approaches and mitigating the variability of modelled RWA, by limiting the scope of application of internal models and constraining their parameters (Table 4). The reform also introduces a leverage ratio requirement for institutions identified as global systemically important institutions (G-SIIs).

Table 4 Main revisions introduced by the final Basel III framework

Risk areas	Main revisions
Credit risk: standardised approach	• Exposures secured by real estate: risk weights become a function of loan-to-value ratios (loan-splitting approach introduced) • Exposures secured by income-producing real estate: standalone risk weight treatment • Retail exposures (excluding real estate): subject to more granular treatment depending on exposure and obligor type • Exposures to corporates: more granular treatment, including specific risk weight for unrated SME exposures • Specialised lending exposures: standalone treatment (three sub-exposure classes) • Covered bonds: standalone risk weight treatment • Exposures to banks: recalibration of risk weights for rated exposures, more granular risk weight treatment of unrated exposures and enhanced due diligence on risk weights • Subordinated debt and equity: more granular risk weight treatment depending on the type of exposure • Off-balance-sheet exposures: revised credit conversion factors
Credir risk: IRB approach	• Removed IRB approach for equity exposures • Removed advanced IRB approach for exposures to: i) large corporates ii) banks iii) financial institutions treated as corporates • Increased floors for PD estimates • Introduction of individual floors for LGD and conversion factors estimates • Increased haircuts on non-financial collateral and reduced F-IRB LGD parameter for both secured and unsecured exposures • Off-balance-sheet exposures: limited scope of modelling of conversion factors and more granular revised regulatory and revised regulatory credit conversion factors • Changes to the credit risk mitigation framework • Removed 1.06 scaling factor in the risk-weight function
Securities financing transactions (SFTs)	• Recalibration of supervisory haircuts • Removal of own estimates of collateral haircuts • Revision to the standardised formula for the calculation of the exposure value of SFTS covered by a master netting agreement • Introduction of minimum haircut floor framework
Market risk	• Changes to the boundary between trading book and banking book • Changes to standardised approach • Changes to Internal model approach

Risk areas	Main revisions
CVA risk	• Inclusion of fair-valued SFTs in the scope of CVA capital requirements • All existing approaches replaced by the new BA-CVA and SA-CVA approaches (removal of advanced method)
Operational risk	• All existing approaches replaced by the new standardised measurement approach
Leverage ratio	• Leverage ratio tier 1 buffer requirement for G-SIIs equal to 50% of the RWA-based G-SII capital buffer requirement • Refinements to the leverage ratio exposure measure
Aggregate output floor	• Bank's total RWA to be the higher of: i) RWA computed with the approaches for which the bank has approval, ii) 72.5% of the RWA computed under the standardised approaches

3. BCBS members agreed to full, timely and consistent implementation of all elements of the package by 1 January 2022 with the exception of the output floor, for which the transitional arrangements include a phase-in implementation until 1 January 2027.

4. The implementation of the agreement in the EU would require amendments to existing EU legislation. As part of the implementation process, in May 2018 the European Commission requested technical advice from the EBA[8] on:

   i) the impact of the overall package of reforms and its various components;

   ii) the implementation of several building blocks of the reform;

   iii) any information necessary to identify implementation challenges and address inconsistencies in both the current and revised regulatory frameworks.

2.2 Data collection process governance

5. The impact assessment in this report is based on QIS data and qualitative survey evidence that institutions provided on a voluntary basis.

6. With the purpose of reducing the burden for participating institutions, the QIS data collection was carried out as part of the Basel III monitoring exercise , which is conducted by the EBA on a semi-annual basis. In order to gather the information necessary to address the European Commission's Call for Advice (CfA), the Basel III monitoring exercise templates were expanded and supplemented, as necessary.

7. All institutions regularly participating in the Basel III monitoring exercise and all additional institutions that volunteered to participate in the Call for Advice data collection and were classified as 'large'[9] were requested to submit a comprehensive set of templates (*full template*).

8. In order to make the data collection proportionate for smaller banks, small banks not participating in the Basel III monitoring exercise were requested to submit a simplified set of

[8] European Commission (2018), 'Call for Advice to the EBA for the purpose of revising the own fund requirement for credit, operational, market and credit valuation adjustment risk'.

[9] Institutions with an amount of tier 1 capital higher than EUR 1.5 billion.

templates (*reduced template*). In addition, all participating banks irrespective of their size were requested to complete and submit a qualitative questionnaire.

9. The timeline of the data collection process was designed to allow banks submitting the reduced set of templates additional time to submit the data (Table 5). The timeline to submit the qualitative questionnaire was the same for all banks irrespective of their size.

Table 5 Timeline for the data collection process

August 2018	Distribution of **templates to institutions** Publication of templates on the EBA website
Oct 2018-Dec 2018	**Deadline for submission** — institutions submitting the **full template**
Nov 2018-Dec 2019	**Deadline for submission** — institutions submitting the **reduced template**
November 2018	**Launch of the qualitative questionnaire**
January 2019	**Deadline for submission of qualitative questionnaire**

2.3 Sample

2.3.1 Bank size classification criteria

10. The Basel framework is designed to apply to large and internationally active institutions. Several jurisdictions, including the EU, traditionally choose to apply the international standards to a wider set of entities.

11. As part of its impact analysis on the revisions to international standards agreed by the BCBS in December 2017, the EBA significantly enlarged the sample of institutions used in the regular monitoring of the implementation of the Basel framework to improve the coverage of smaller and less complex institutions. Taking into account the size and complexity of institutions is a crucial step of any policy-making process that aims to establish a proportionate regulatory framework.

12. The EBA chose to classify institutions in the QIS sample as 'large', 'medium' or 'small and non-complex' in accordance with the criteria specified in the May 2018 Council proposal for amending the CRR[10]. Such criteria relate to balance sheet size and systemic risk importance, but also elements of complexity such as trading activities and the use of internal models for regulatory purposes (Table 6).

[10] Proposal for a regulation of the European Parliament and of the Council amending Regulation (EU) No 575/2013 from 22 May 2018. Compared with the draft proposal from May 2018, in the final amended CRR, Regulation 2019/876, published in the Official Journal on 7 June 2019, the criteria for identifying small and non-complex institutions have been slightly changed, as additional conditions were added for an institution to be identified as small and non-complex. The updated classification could not be used because the necessary data were not collected from institutions.

Table 6 Simplified size clustering criteria[11] (based on May 2018 Council proposal for amending the CRR)

Size	Criteria
Large	**The institution meets <u>any</u> of the following conditions:** a) Identified as G-SII in accordance with Article 131(1) and (2) of Directive 2013/36/EU b) Identified as O-SII in accordance with Article 131(1) and (2) of Directive 2013/36/EU c) One of the three largest institutions in terms of total value of assets in the Member State in which it is established d) The total value of the institution's assets on the basis of its consolidated situation is equal to or larger than EUR 30 billion
Small (and non-complex)	**The institution It is not a 'large' institution (see criteria above)and meets <u>all</u> of the following conditions:** a) The total value of its assets on an individual basis or, where applicable, on a consolidated basis in accordance with this Regulation and Directive 2013/36/EU is equal to or less than the threshold of EUR 5 billion over the four-year period immediately preceding the current annual disclosure period b) Its trading book business is classified as small within the meaning of Article 94 of the May 2018 Council proposal for amending the CRR c) The total value of its derivative positions is less than or equal to 2% of its total on- and off-balance-sheet assets, whereby only derivatives which qualify as positions held with trading intent are included in calculating the derivative positions d) The institution does not use internal models for calculating its own funds requirements
Medium	**The institution is neither 'large' nor 'small'**

2.3.2 Business model classification

13. Any impact analysis related to a major regulatory reform should assess its impact for institutions operating under different business models. For a jurisdiction such as the EU, where different banking systems and financial markets specificities traditionally coexist, it is particularly important not to limit the impact analysis to a population of universal banks.

[11] The proposed criteria were simplified as follows: i) the criterion on the application of simplified resolution obligations was disregarded; ii) the criteria on the discretionary classification of institutions by their national competent authorities were disregarded; iii) an individual data point (June 2018) instead of time averages was used whenever the May 2018 proposal required thresholds to be met in terms of time average values.

14. For this reason the EBA also strived to improve the sample coverage in terms of business models other than the universal bank.

15. Institutions are classified in accordance with the EBA classification of business models,[12] including the following business models (for a detailed description of each business model's characteristics please see Annex 1):

- cross-border universal banks (Cross-border U);
- local universal banks (Local U);
- automotive and consumer credit banks (Auto & Cons);
- building societies (Building Soc);
- locally active savings and loan associations / cooperative banks (S&L Coop);
- private banks (Private);
- custody banks (Custody);
- central counterparties (CCP);
- merchant banks (Merchant);
- leasing and factoring banks (Leasing);
- public development banks (Public Dev);
- mortgage banks (including pass-through financing models) (Mortgage);
- other specialised banks (Other special).

2.3.3 Consolidation

16. Institutions participating in the data collection exercise were asked to report data at the highest level of EU consolidation, so as to ensure that no double-counting of impact occurs.

17. Furthermore, in order to improve the representativeness of the sample in terms of business models and geography, subsidiary institutions designated as other systemically important institutions (O-SIIs) in jurisdictions other than their parent company's jurisdiction were encouraged to submit QIS data at the highest level of consolidation in the country where they are located.[13]

[12] See also Cernov, M., and Urbano, T. (2018), 'Identification of EU bank business models', EBA Staff Papers.

[13] Data submissions were also accepted from three subsidiaries of EU parents that are not designated as O-SIIs in the jurisdiction where they are located but represent specialised business models that otherwise would not have been covered to a sufficient extent based on submissions at the highest level of EU consolidation. Table 9**Table 9** for further detail on the subsidiaries of EU parents that are included in the cumulative analysis.

18. Unless stated otherwise, subsidiaries of EU parents are included in the average calculations only when impact results are presented by business model or by country, provided that they do not belong to the same business model or country as their parent company.

2.3.4 Samples based on data quality

19. Depending on data quality criteria, three types of samples are used in this report,[14] as follows:

- **Cumulative sample**: the cumulative sample is the one used to assess the cumulative impact of the reform and highlights the contribution of each risk category to the total impact;
- **Risk-specific samples:** risk-specific samples are used to assess the impact of the reform within each risk category (e.g. SA for credit risk, IRB for credit risk, market risk etc.), shedding light on the contribution of different portfolios, transactions or regulatory approaches to the total impact assigned to any given risk category;
- **Sensitivity analysis samples:** scenario-specific samples are those used to answer questions related to the marginal impact of any given specific policy reform or alternative policy scenarios within a given risk category.

2.3.5 Cumulative sample: summary statistics

20. A total of 234 institutions participated in the QIS data collection exercise. Among these, 218 institutions submitted data at the highest level of consolidation in the EU, while 16 submitted data at the level of subsidiary of an EU parent.

21. Out of 218 banks that submitted data at the highest level of consolidation, 189 institutions submitted data of sufficient quality to be included in the cumulative analysis (Table 7, Table 8, Table 9). The 189 institutions of the cumulative analysis are classified by business model (Table 8) and by bank size (Table 9).

Table 7 Cumulative analysis sample, by country (highest level of EU consolidation)

Country	Number of banks
AT	15
BE	7
DE	40
DK	8
EE	2
ES	10
FI	5
FR	14
GR	4
HU	1

[14] See Annex 1, 'Sample and methodology', for the list of necessary conditions for inclusion into the different samples.

Country	Number of banks
IE	8
IT	24
LU	6
MT	1
NL	12
NO	6
PL	9
PT	6
SE	11
Total	**189**

Table 8 Cumulative analysis sample, by business model (highest level of EU consolidation)

Business model	Number of banks
Cross-border U	40
Local U	52
Auto & Cons	7
Building Soc	6
S&L / Coop	34
Private	8
Custody	7
CCP	1
Merchant	5
Leasing	1
Public Dev	10
Mortgage	8
Other special	10
Total	**189**

Table 9 Cumulative analysis sample, by bank size (highest level of EU consolidation)

Bank size	Number of banks
Large	104
Of which: G-SIIs	8
Of which: O-SIIs	67
Medium	61
Small	24
Total	**189**

22. Out of 16 subsidiaries of EU parents that submitted data (from 8 Member States), 15 submitted data of sufficient quality to be included in the subsidiary analysis presented in section 10 (Table 10 and Table 11). Out of these, 12 are designated as O-SIIs in the jurisdictions where they are located.

Table 10 Sample of subsidiaries of EU parents, by country

Country	Number of banks
BE	1
DE	2
FR	1
HR	2
IE	2
LV	2
PL	3
PT	2
Total	**15**

Table 11 Sample of subsidiaries of EU parents, by business model

Business model	Number of banks
Cross-border U	1
Local U	11
Auto & Cons	1
Leasing	1
Other special	1
Total	**15**

23. The sample of the cumulative analysis covers approximately 85% of the total assets of EU domestic banking groups and stand-alone banks. The level of coverage varies across jurisdictions (Table 75 in Annex 1). It is lowest for Malta and Estonia (12% and 15%, respectively) and varies from 73% to 126% for the remaining jurisdictions. The coverage reaches above 100% in those jurisdictions where some QIS participants are EU-located subsidiaries of non-EU-controlled (e.g. US) groups and are therefore not included in the denominator of the coverage ratio.

2.3.6 Qualitative questionnaire sample: summary statistics

24. In order to gather qualitative information on policy aspects whose impact cannot be quantified, the EBA circulated a qualitative questionnaire among a sample of EU institutions and associations. A total of 177 institutions provided responses to the qualitative questionnaire (Table 12 and Table 13). Of these, 174 also participated in the QIS data collection.

Table 12 Qualitative questionnaire sample, by country

Country	Number of banks
AT	16
BE	1
DE	31
DK	6
EE	2
ES	10
FI	5

Country	Number of banks
FR	17
GR	5
HR	2
HU	1
IE	12
IT	20
LU	6
LV	1
NL	9
PL	13
PT	7
SE	13
Total	**177**

Table 13 Qualitative questionnaire sample, by business model

Business model	Number of banks
Cross-border U	37
Local U	59
Auto & Cons	9
Building Soc	4
S&L Coop	28
Private	5
Custody	6
Merchant	3
Leasing	2
Public Dev	9
Mortgage	7
Other special	8
Total	**177**

2.4 Methodology

2.4.1 Aggregation

25. Unless otherwise stated in the report:

- all averages are weighted (e.g. average RWA in the EU is weighted by country RWA);
- averages by country or business model include institutions that are subsidiaries of EU parents, unless they belong to the same country or business model as their parent company.

2.4.2 Impact assessment scenarios

26. Unless stated otherwise, the **baseline scenario** of any impact calculation presented in the report is the fully-loaded national implementation of the Basel II standards, i.e. the CRR/CRD framework as currently applied in each Member State.

27. The final Basel III framework is implemented in accordance with a **central reform scenario** based on the full implementation of the December 2017 agreement and removing any major EU-specific treatments applicable in the current framework. This implementation scenario is the closest to an implementation of the 'pure' Basel III framework (Table 14).

Table 14 Main features of the central reform scenario

Risk area	Features
Credit risk	SA: external credit-ratings approach implemented
	SA: loan-splitting method implemented on general residential and commercial real estate, as well as on income-producing commercial real estate passing the 'hard test' requirement[15]. Whole loan approach implemented on income-producing residential real estate.
	Risk-weighting of insurance holdings laid down in Article 49 of the CRR (as per Danish compromise)
	SA and IRB: CRR SME supporting factor not implemented
Securities Financing transactions (SFTs)	2017 BCBS framework
Market risk	FRTB standards as per 2016 BCBS publication (disregarding January 2019 amendments)
CVA risk	CRR CVA exemptions not implemented
Operational risk	Internal loss multiplier: bank-specific value for institutions in Business Indicator bucket 2 and bucket 3
	Minimum loss threshold: EUR 20 000
Output floor	Floored RWA applied to the full stack of capital requirements (i.e. main approach to the output floor)
Transitional measures in Dec 2017 agreement	No transitional measures are applied

28. Specific chapters of the report compare the impact of **alternative scenarios** with the impact of the **central scenario** to provide advice on the marginal impact of specific policy reforms and/or the implementation of alternative policy proposals. As an example, in order to assess the marginal impact of the newly set IRB probability of default (PD) input floors, the impact of the central scenario is compared with the impact of an implementation scenario in which the whole package of reform is implemented with the exception of the new calibration of the PD input floors (Table 15). This comparative approach is also called the 'all but one approach'.

[15] The 'hard test' requirement is a test on the losses stemming from exposures secured by real estate at the level of the Member State, see foonote 49 on page 24 of BCBS (2017), "Finalising Post-Crisis Reforms".

Table 15 Examples and purpose of alternative reform scenarios considered in the report

Marginal impact type	Example of alternative scenario	Purpose
Marginal impact of individual policy reforms	Central reform scenario modified to exclude only the new calibration of IRB PD input floors	Assessment of marginal impact of the PD input floors
Marginal impact of alternative policy options	Central reform scenario modified to set the internal loss multiplier for operational risk to 1 instead of to a bank-specific value for institutions of BI buckets 2 and 3	Assessment of the marginal impact of exercising the ILM = 1 national discretion

2.4.3 Impact metrics

Minimum required capital (MRC)

29. Whenever represented throughout the report, MRC is computed by multiplying the institution's total RWA by the sum of the following capital requirements:

- Pillar 1 minimum requirement:
  - 4.5% common equity tier 1 (CET1);
  - 6% tier 1 (T1);
  - 8% total capital (TC);
- Pillar 2 requirement;[16]
- combined buffer requirement,[17] fully loaded (i.e. its value as applied at the end of all the transitional arrangements).

30. Unless stated otherwise the same capital requirements (those applicable as of June 2018) are used to compute both baseline and revised MRC figures. This implies that the impact of the Basel III reform measured in terms of change in MRC mostly stems from changes in the RWA calcualtion and not from changes in capital requirements (see section 3).

31. The change of MRC from the baseline to the final Basel III framework takes into account the interaction between the RWA-based metric of T1 capital and the leverage ratio-based T1 metric of capital. More specifically, the T1 capital for the baseline scenario is the higher of the current RWA-based metric of T1 capital and the current leverage ratio-based metric of T1 capital. The revised T1 capital for the central reform scenario is the higher of the revised RWA-based metric of T1 capital and the revised leverage ratio-based metric of T1 capital.

[16] Pillar 2 requirements are obtained by deducting the Pillar 1 minimum requirement from the reported total supervisory review and evaluation process (SREP) capital requirment (TSCR), for each of the three different layers of regulatory capital (CET, T1, TC). The resulting Pillar 2 percentage requirement of RWA is applied, unchanged, to both current and revised RWA.

[17] The combined buffer requirement is computed in accordance with the EBA Q&A 2015_1079, which describes how the combined buffer requirement is to be computed and reported. This entails different formulae depending on whether Article 131(14) or (15) of the Directive 2013/36/EU applies.

32. The CET1 (or TC) MRC for IRB banks is adjusted to reflect the change in IRB shortfall[18] (or surplus[19]) from the current to the final Basel III framework.[20] Such adjustments are implemented on both the MRC stemming from the RWA-based requirement and the MRC stemming from the leverage ratio-based requirement.

Regulatory capital ratios and shortfalls

33. Regulatory capital ratios (CET1, T1, and TC) in all scenarios are computed using fully loaded measures of regulatory capital, i.e. their values as implemented at the end of all the transitional arrangements. The numerator of the capital ratios (i.e. the capital measure) is adjusted to take into account CET1 deductions or tier 2 (T2) additions that IRB institutions have to implement when they incur — respectively — a shortfall or an excess of provisions with respect to expected losses.

34. For institutions using internal models that have their RWA floored by the output floor in the final Basel III framework, floored RWA are used to compute capital ratios.

35. Capital shortfalls result from the difference between available capital and the MRC applicable under the final Basel III framework (when such difference is negative). The T1 shortfall measure takes into account the shortfall that institutions incur in the final Basel III framework due to the leverage ratio, where the leverage ratio is the constraining requirement.

36. Neither management buffers nor institutions' target ratios are taken into account in the calculation of the capital shortfall. In this sense the shortfall figures measured in this analysis are pure measures of regulatory capital shortfall.

2.4.4 Main differences with respect to the EBA-Basel III monitoring analysis

37. The impact assessment methodology broadly follows the methodology already used in regular EBA reports on the monitoring of the Basel III reforms published in March 2019.[21]

38. The most relevant methodological differences across the two analyses are:

- **Sample**: compared with Basel III monitoring sample, the sample used in this report includes a larger number of institutions, covering more jurisdictions, more specialised business models and a larger share of small institutions, and excludes UK institutions.

- **Calculation of the MRC:** whereas the Basel III monitoring reports compute MRC based on Pillar 1 minimum requirements only augmented by the capital

[18] IRB shortfall arises when provisions are lower than expected losses.

[19] IRB surplus arises when provisions are in excess of expected losses. IRB surplus can be reflected in tier 2 capital up until the limits laid down by the CRR.

[20] Excess provisions with respect to expected losses are reflected only in TC MRC, as they take the form of tier 2 capital.

[21] See for instance the EBA Basel III monitoring report published in March 2019 (reference data: as of June 2018).

conservation buffer and (where applicable) the G-SII buffer, in the current report MRC is computed taking into account the full combined buffer requirement as well as the Pillar 2 requirement (see section 3);

- **Presentation of the output floor and leverage ratio impact within the cumulative impact:** the order in which leverage ratio and output floor are included in the calculation of the total revised T1 minimum capital requirement (MRC) matters for determining the marginal contribution of each of the two elements to the total average change in MRC (which instead is not sensitive to the order). A given policy requirement tends to provide a lower contribution to the total MRC change when it is implemented last in the total MRC calculation, as it adds on a relatively higher cumulative requirement. Its marginal contribution is instead higher when it is implemented ahead of the other requirement. The present analysis implements the output floor as the last element of the regulatory framework, as the leverage ratio was agreed upon prior to the finalisation of the December 2017 package. The main results presented in the Basel III monitoring analysis, instead, implement the leverage ratio last in the total MRC calculation. Nevertheless, the same methodology used in this report is also presented as an alternative approach in the Basel III monitoring analysis.

39. Other elements of difference in methodology across the two pieces of analysis relate to the treatment of the IRB shortfall/excess, the treatment of IRB provisions, data quality criteria related to CVA and more general adjustments for data quality (Table 16).

Table 16 Other differences in methodology between EBA Basel III monitoring repot and this report

	EBA Basel III monitoring	This report
Adjustment for IRB shortfall	The IRB shortfall is converted into minimum required capital only in the case of the RWA-based requirement and includes an additional adjustment due to the removal of the exemption to risk weight equity exposures under Article 49 of the CRR[22].	The IRB shortfall is converted into minimum required capital in the case of both the RWA-based and the leverage ratio-based requirement
Calculation of revised provisions (IRB banks)	Provisions applicable in the revised framework are obtained as a proportion of the current provisions based on the expected loss change	Provisions applicable in the revised framework are obtained as a proportion of the current provisions based on the exposure change.
CVA risk data quality	Reported figures in June 2018 COREP and this report are not compared	Figures reported in this report are scaled on the basis of figures reported in June 2018 COREP. Data based on the EU specific template.
Data quality adjustments		Additional data adjustments and fall back approaches are applied:

[22] Due to data quality issues found in the equity data within the QIS analysis, this adjustment have not been included in the results show in this report as indicated in "Box 2 Caveat on the impact of the reform on equity exposures under CRR Article 49"

	EBA Basel III monitoring	This report
		- Non modelled RWA are equalized to the revised RWA when the data is not available Fall back approach to select the amount of actual capital

On the use of Pillar 2 and combined buffer requirements in the calculation of MRC

40. The Commission's Call for Advice requires the EBA to compute the impact of the revised Basel III framework taking into account the full stack of minimum capital and buffer requirements that apply in the EU. The inclusion of the CET1 combined buffer requirement and Pillar 2 requirement is a major element of difference between this analysis and the analysis the EBA regularly publishes in the context of the EBA Basel III monitoring reports.

41. The simplest and most objective way of factoring in all capital requirements is the **assumption of static capital requirements** adopted in this analysis. Capital requirements reported by institutions as of June 2018[23] are used to compute the capital requirement (MRC) applicable in both the baseline and central scenarios. This is the case for both Pillar 2 and the CET1 combined buffer requirements.

42. The main implications of using Pillar 2 and combined buffer requirements in the calculation of the minimum capital requirement are the following:

- **Potential overestimation of impact:** impact figures, particularly those in terms of regulatory capital shortfall,[24] are likely to overestimate the actual impact of the reform. In fact, both Pillar 2 and combined buffer requirements are calibrated taking into account, among other factors, the current level of RWA. Higher RWA resulting from the implementation of the revised framework may lead — in some cases — to a revision and, possibly, re-calibration of the Pillar 2 and buffer requirements.

- **Composition of the weighted average MRC results:** the use of Pillar 2 and combined buffer requirements in the calculation of weighted average MRC impact figures affects the weight of institutions/jurisdictions for which Pillar 2 and/or combined buffer requirements are higher than average. If, for instance, jurisdictions where Pillar 2 and/or combined buffer requirements are higher than

[23] An exception to this general principle is made for Sweden. As of June 2018 the Swedish FSA implemented a macroprudential 25% IRB risk weight floor on exposures secured by real estate located in Sweden in the form of a Pillar 2 requirement. In December 2018 the Swedish FSA converted this measure into a Pillar 1 RWA measure under Article 458 of the CRR. Pillar 2 requirements for IRB banks in Sweden were substantially lowered as a result of this policy change. In order to reflect this major policy change for Sweden, December 2018 Pillar 2 figures were used to calculate the MRC applicable to Swedish institutions in both the baseline and central reform scenarios.

[24] The calculaton of the percentage change in MRC at the individual bank level is less sensitive to the use of Pillar 2 and buffer requirements because the same requirement rates are applied to both the current and revised MRC calculations. In this way, the percentage change in MRC mostly reflects variations in RWA rather than the type of own funds requirements applied. Pillar 2 and combined buffer requirements affect in a linear fashion the revised capital requirement (revised MRC) and through this variable have a direct effect on regulatory capital shortfall figures.

average — or very high — experience a particularly high impact of the output floor, the contribution of the output floor in the EU weighted average MRC impact will be higher when Pillar 2 and combined buffer requirements are included in the calculation.

- **Downsized role of the leverage ratio:** when Pillar 2 and combined buffer requirements are included in the MRC calculation, all RWA-based measures of capital — including the one based on output-floored RWA — increase on average relative to the leverage ratio-based capital requirement, as the level of the latter is not sensitive to Pillar 2 buffer requirements. This results in a downsized average role of the leverage ratio within the regulatory framework.

2.5 Data quality and interpretation of the results

43. The results should be interpreted with caution, taking into account data quality and several simplifying assumptions.

44. Given the complexity of the exercise, banks were asked to report very granular and specific data implementing standards that are not yet in place. In order to provide this data, it is likely that banks themselves used a number of approximations, assumptions and shortcuts. The expectation is that, when in doubt about specific elements of the revised standards or the interpretation of the instructions, institutions may have made conservative reporting choices, leading to an overestimation of the impact.

45. In addition, a number of simplifying and conservative assumptions were taken that may result in an overestimation of the capital impact, as follows:

- **Static balance sheet assumption**: institutions do not react to the revised requirements by adjusting their business and/or managing the regulatory capital costs.

- **Static requirements assumption:** which results in Pillar 2 and combined buffer requirements as of June 2018 to be used both for the baseline and 2027 reform scenarios. Higher RWA resulting from the implementation of the revised framework may lead – in some cases – to a revision and, possibly, re-calibration of the Pillar 2 and buffer requirements;

- **FRTB standards:** an overestimation of impact may also arise from the fact that the exercise assesses the impact of the January 2016 FRTB framework and disregards the January 2019 revisions to that framework, which are expected to deliver a lower impact of the FRTB reform.[25]

[25] Based on estimations, the latter would lower the shortfall by up to EUR 4 billion.

- **Profit retention to cover capital shortfall:** the cumulative impact analysis assumes no role for profit retention in rebuilding the capital base. An exercise based on 2014-2018 average profits for the QIS sample shows that the resulting 2027 total capital shortfall could more than halve if banks retained generated profits.

2.6 Structure of the report

46. This report is structured as follows:

- **Chapter 3** provides an overview of the impact of the reform focusing on a 'central reform scenario';

- **Chapters 4 to 9** elaborate on the impact of the final Basel III framework in risk-specific areas, covered in the following order: credit risk under the standardised approach and IRB approach, securities financing transactions, market risk, CVA risk, operational risk and the aggregate output floor;

- **Chapter 10** focuses on the impact of the reform on subsidiary institutions, based on QIS data and evidence from the qualitative survey;

- the **annexes** include i) additional information on sample and methodology, ii) additional impact assessment results and iii) an overview of the composition of current (i.e. CRR baseline) capital requirements for the sample.

3. Main findings

3.1 Changes in minimum required capital (tier 1 MRC)

47. The implementation of the final Basel III standards is expected to increase tier 1 minimum required capital (T1 MRC) by 24.4% (Table 17). The output floor (+9.1%) explains over one third of the total impact, with credit valuation adjustment (CVA) (+3.9%) and operational risk (+3.3%) being, respectively, the second and third most important drivers of impact. The reforms of the standardised approach (SA) (+2.7%) and internal ratings-based (IRB) approach (+2.7%) to credit risk contribute almost equally to the total impact. The impact of the revisions related to securitization (+0.6%), exposure to central counterparties (CCPs) (+0.1%) and other elements of the risk-weighted assets (RWA) calculation appears, on average, minor or negligible.

48. The leverage ratio constrains only a limited number of institutions in the current framework, and becomes even less relevant with the implementation of the final Basel III framework, as the reforms of the RWA calculation leads to an increase in total RWA. The low negative offset effect (-0.5%) indicates that the leverage ratio backstop requirement is less binding when implementing the final Basel III framework.

Table 17 Percentage change in T1 MRC (relative to current T1 MRC), EU weighted average

	SA	IRB	CCP	SEC	MKT	OP	CVA	RWs	LR	OF	TOTAL
All banks	2.7	2.7	0.1	0.6	2.5	3.3	3.9	15.8	-0.5	9.1	**24.4**

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Notes: Based on a sample of 189 banks. SA, standardised approach to credit risk; IRB, internal ratings-based approach to credit risk, CCP, central counterparty, SEC, securitisation; MKT, market risk; OP, operational risk; CVA, credit valuation adjustment; RWs, total risk-based requirements (sum of all preceding columns); LR, leverage ratio; OF, output floor.

49. As explained in section 2, the application of Pillar 2 and combined buffer requirements[26] in the calculation of the MRC is likely to overestimate the impact of the reform. When Pillar 2 and EU-specific buffer requirements are excluded from the impact calculation, the average change in T1 MRC for the EU sample amounts to 18.4%. Taking into account the different sample and other methodological differences, this impact figure is, by and large, in line with the impact results that the EBA published in the March 2019 EBA Basel III monitoring report[27] (see Annex 2).

50. The T1 MRC impact is very heterogeneous across the sample of participating institutions (Table 18). One quarter of the sample is subject to a T1 MRC increase close to 0% or a capital relief. The median institution incurs a moderate increase in T1 MRC, equal to 10.6%. In the highest quartile of the distribution some very large outlier institutions drive the weighted average result.

[26] The combined buffer requirement is computed in accordance with the EBA Q&A 2015_1079, which describes how the combined buffer requirement is to be computed and reported. This entails different formulae depending on whether Article 131(14) or (15) of the Directive 2013/36/EU (CRD) applies. The combined buffer requirement is different from the buffer requirement used in the regular Basel monitoring, in which only Basel-specific buffers — capital conservation buffer and GSIIs buffers — are included, while EU-specific buffer requirements are excluded.

[27] See March 2019 EBA Basel III monitoring.

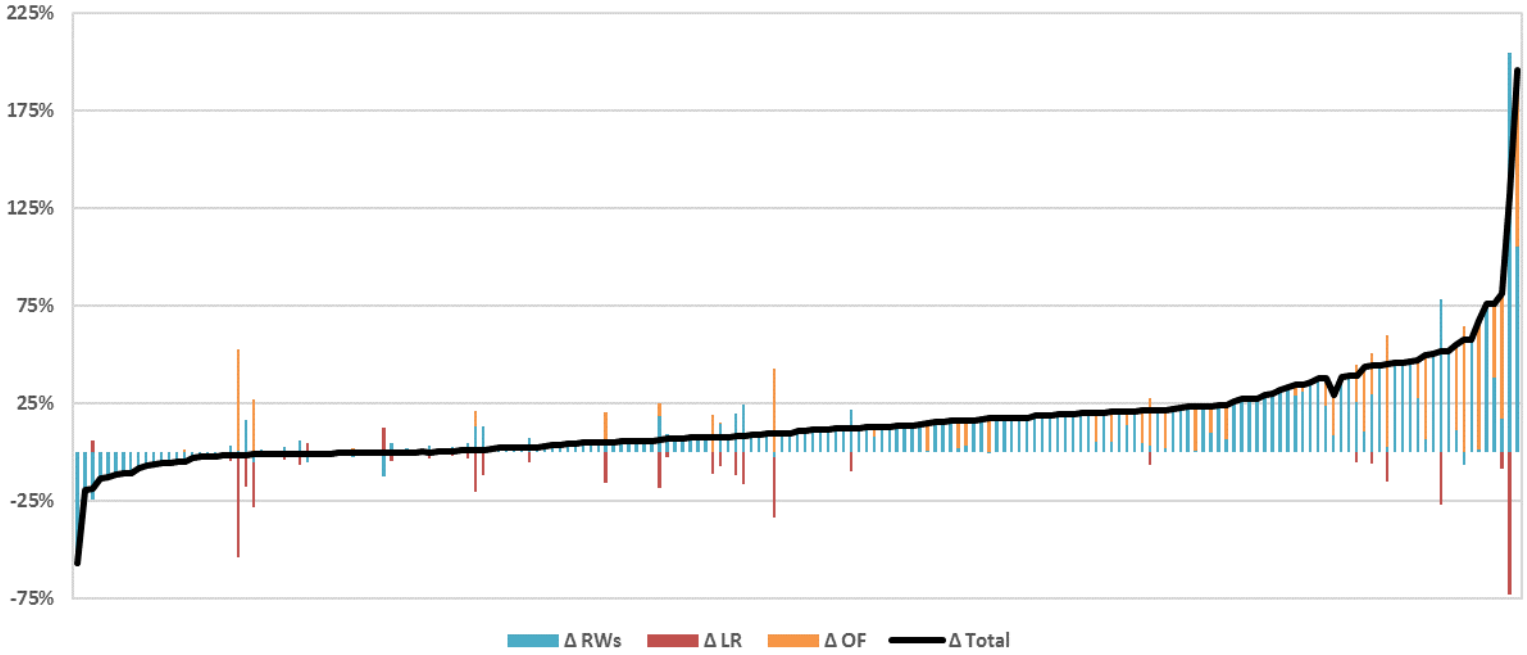
Table 18 Distribution of percentage change in T1 MRC (relative to current T1 MRC), all banks

Percentile	Percentage
5th percentile	-6.6
25th percentile	0.2
Median	10.6
75th percentile	21.4
95th percentile	51.4

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Notes: Based on a sample of 189 banks.

51. In the left tail of the impact distribution, several institutions experience an overall decrease in the T1 MRC. This result is in most cases driven by a decrease in the T1 MRC related to operational risk or the SA for credit risk (Figure 1). In the right tail of the distribution, the output floor is a key driver of impact.

Figure 1 Percentage change in T1 MRC (relative to current T1 MRC), bank-by-bank data

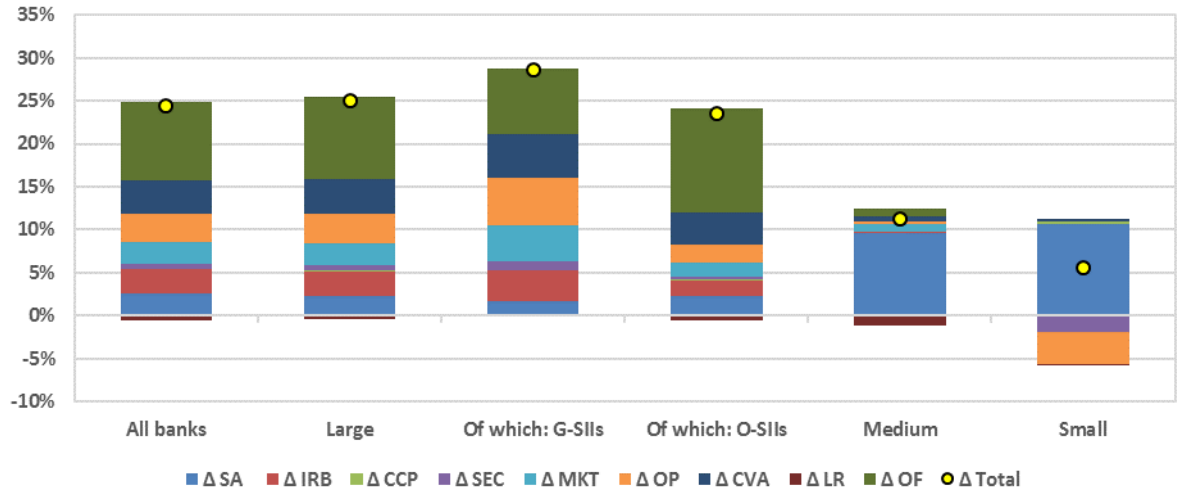


Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 189 banks.

52. The impact of the reform and its main drivers are heterogeneous between institutions of different size and complexity (Figure 2). In particular:

- Large and systemically important institutions experience a greater impact than medium-sized and small (non-complex) ones.
- The output floor is the main driver of impact for systemically important institutions, and more broadly for large institutions, whereas it has a minor impact on institutions of medium size and does not affect small institutions (the latter by definition are those that do not use internal models for regulatory purposes).
- The new operational risk framework is an important driver of impact mostly for G-SIIs. It only slightly affects medium-sized institutions and leads to a decrease in regulatory capital for small institutions.
- As expected, medium-sized and small institutions see their capital requirement increase mostly due to the revisions to the standardised approach to credit risk.

Figure 2 Percentage change in T1 MRC (relative to current T1 MRC), by bank size



Sources: EBA 2018-Q2 QIS data and EBA calculations.
Notes: Based on a sample of 189 banks: Large (104), of which G-SIIs (8), of which O-SIIs (67); Medium (61); Small (24).
SA, standardised approach to credit risk; IRB, internal ratings-based approach to credit risk; CCP, central counterparty; SEC, securitisation; MKT, market risk; OP, operational risk; CVA, credit valuation adjustment; LR, leverage ratio; OF, output floor.

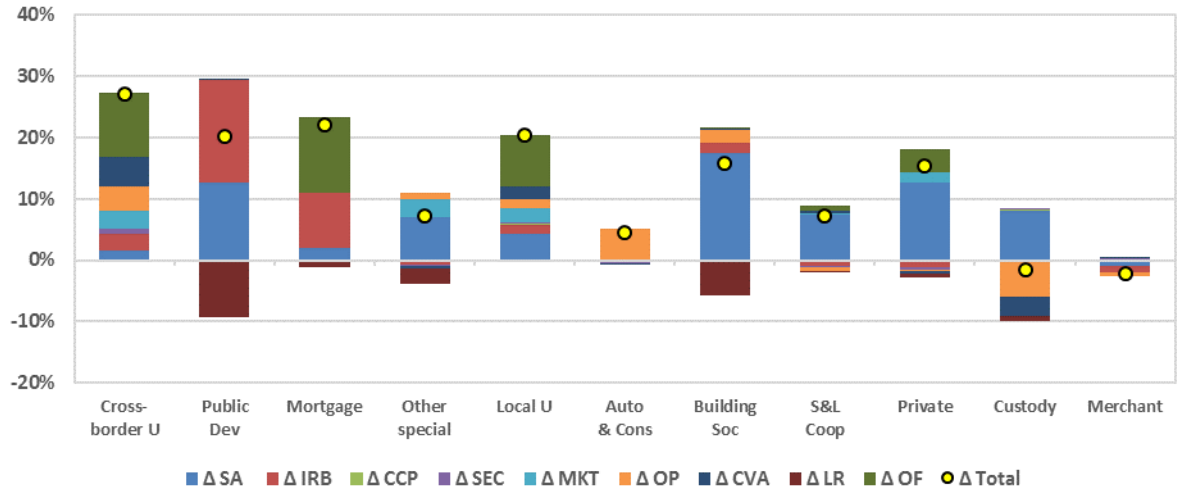
53. The impact of the reform is also heterogeneous between institutions operating under different business models (Figure 3). In particular:

- The highest impact on T1 MRC (+27%) is seen in cross-border universal banks. The main driver of the impact for this group of institutions is the output floor, followed by CVA and operational risk. As the largest banks are included in this business model group, the results are in line with the sample weighted average results.

- High impacts, but below the overall weighted average, were detected for mortgage banks (+22%), local universal banks (+20%) and public development banks. For mortgage banks, the impact is driven by output floor (half of the impact) and changes in the IRB framework. For local universal banks, almost half of the impact is driven by output floor and the remaining half is driven by all other areas of reform. For public development banks, the impact is driven by both changes in credit risk SA and IRB.

- Impacts were lower for building societies and private banks (+15%). In both cases the impact is driven by changes in the credit risk SA framework.

Figure 3 Percentage change in T1 MRC (relative to current T1 MRC), by business model



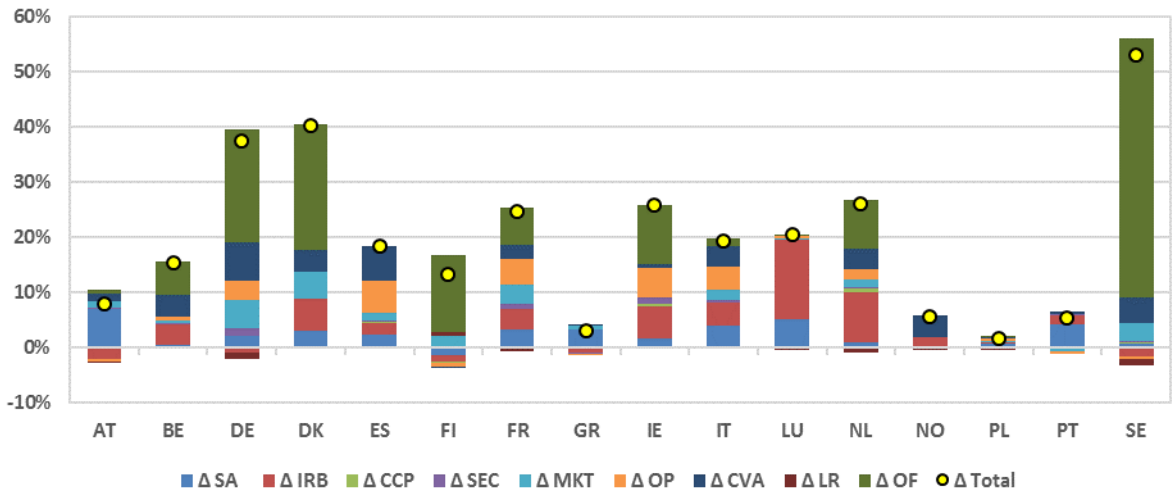
Sources: EBA 2018-Q2 QIS data and EBA calculations.
Notes: Based on a sample of 204 banks: Cross-border U (41), Leasing* (2), Public Dev (10), Mortgage (8), Other special (11), Local U (63), Auto and Cons (8), Building Soc (6), S&L Coop (34), Private (8), Custody (7), Merchant (5), CCP* (1).

SA, standardised approach to credit risk; IRB, internal ratings-based approach to credit risk; CCP, central counterparty; SEC, securitisation; MKT, market risk; OP, operational risk; CVA, credit valuation adjustment; LR, leverage ratio; OF, output floor.

* Not shown in the chart because fewer than three entities in the cluster.

54. The impact also varies between countries (Figure 4). The highest impact is measured in relation to the Swedish sample. It reaches 55%, mostly driven by the output floor (around 45 p.p.). Denmark and Germany follow, with an impact of around 40%, of which approximately half is driven by the output floor and another quarter comes from changes in the CVA and market risk frameworks. The Netherlands, Ireland and France have an MRC impact of around 25%. This impact is only partially (around one third) driven by output floor, other components of the reform also contributing in different degrees to the impact.

Figure 4 Percentage change in T1 MRC (relative to current T1 MRC), by country



Sources: EBA 2018-Q2 QIS data and EBA calculations.
Notes: Based on a sample of 203 banks: AT (15), BE (8), DE (42), DK (8), EE* (2), ES (10), FI (5), FR (14), GR (4), HR* (2), HU* (1), IE (10), IT (24), LU (6), LV* (2), MT* (1), NL (12), NO (6), PL (12), PT(8), SE (11).

SA, standardised approach to credit risk; IRB, internal ratings-based approach to credit risk; CCP, central counterparty; SEC, securitisation; MKT, market risk; OP, operational risk; CVA, credit valuation adjustment; LR, leverage ratio; OF, output floor.

* Not shown in the chart because fewer than three entities in the cluster.

3.2 Changes in risk-weighted assets

55. The impact of the reform in terms of RWA closely mimics the impact measured in terms of T1 MRC (Table 19).

Table 19 Distribution of percentage change in RWA (relative to current RWA), by bank size

Bank size	RWA change (%)
All banks	**24.5**
Large	25.0
of which: G-SIIs	27.9
of which: O-SIIs	22.9
Medium	14.0
Small	6.6

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Notes: Based on a sample of 189 banks: Large (104), of which G-SIIs (8), of which O-SIIs (67); Medium (61); Small (24).

56. RWA and T1 MRC changes do not fully correspond, for the following reasons:

- the T1 MRC calculation takes into account the leverage ratio T1 MRC requirement, for those institutions that are constrained by the leverage ratio in either the baseline or the reform scenario;

- the T1 MRC calculation takes into account the IRB shortfall (of provisions versus expected losses) for institutions using the IRB approach to credit risk.[28]

3.3 Impact on capital ratios and capital shortfalls

57. The final Basel III framework would lead to a decrease in the total capital (TC) ratio of approximately 3.6 percentage points (p.p.), from 17.9% to 14.3%. The reduction is slightly lower for the T1 and CET1 ratios, which will reach, respectively, 12.3% and 11.5% in the revised framework (Table 20).

58. With the introduction of the final Basel III standards as of 2027 — without taking into account any transitional measure — the EU sample is expected to incur a TC shortfall of approximately EUR 135.1 billion. The shortfall is expected to arise almost exclusively for large institutions, with G-SIIs accounting for just over 60% of the total amount.

Table 20 Capital ratios and shortfalls, by bank size

Bank size	CET1			T1			TC		
	Current ratio (%)	Revised ratio (%)	Shortfall (EUR bn)	Current ratio 9%)	Revised ratio (%)	Shortfall (EUR bn)	Current ratio (%)	Revised ratio (%)	Shortfall (EUR bn)
All banks	**14.4**	**11.5**	**91.1**	**15.3**	**12.3**	**127.5**	**17.9**	**14.3**	**135.1**
Large	14.2	11.4	91.0	15.2	12.2	126.8	17.8	14.2	134.1
of which: G-SIIs	12.7	9.9	53.5	13.8	10.8	69.0	16.2	12.7	82.8
of which: O-SIIs	15.4	12.5	33.6	16.3	13.2	51.5	19.	15.6	43.8
Medium	17.4	15.2	0.1	17.6	15.4	0.8	19.0	16.6	0.9
Small	17.0	16.0	0.0	17.2	16.1	0.0	18.3	17.1	0.1

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Notes: Based on a sample of 189 banks: Large (104), of which G-SII (8), of which O-SII (67); Medium (61); Small (24). Tier 1 and total capital shortfalls include the shortfall incurred by institutions constrained by the leverage ratio in the revised framework.

59. Excluding Pillar 2 and buffer requirements from the calculation, the TC shortfall amounts to EUR 39.9 billion (see Annex 2).

3.3.1 The role of retained profits during the transitional implementation phase

60. The gradual build up of the shortfall during the transitional phase (2022-2026) reflects the stepwise calibration of the output floor (Table 21) without considering any increase in capital over time.

Table 21 Evolution of TC shortfall during phase-in implementation of the output floor (EUR billion)

	1 Jan 2022	1 Jan 2023	1 Jan 2024	1 Jan 2025	1 Jan 2026	1 Jan 2027
Output floor calibration (%)	50	55	60	65	70	**72.5**
TC shortfall (EUR billion)	80.1	80.7	88.0	101.1	118.9	**135.1**

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Notes: Based on a sample of 189 banks.

[28] Excess provisions with respect to expected losses are reflected only in TC MRC, as they take the form of tier 2 capital.

61. To put the capital shortfall figures into perspective, the EBA has assessed the ability of institutions to cover this shortfall solely by retaining profits as a mean of rebuilding their capital base.[29]

62. Assuming that institutions start to retain profits from the first date of the phase-in period (i.e. 2022) to cover their shortfall,[30] only 43.4% (or EUR 58.7 billion) of the EUR 135.1 billion regulatory shortfall in TC will materialise in 2027 (Table 22). Similarly, using the same assumption, in case of CET1 shortfall, only 44.5% of the EUR 91.1 billion shortfall would materialize in steady state (Table 23). The outstanding steady-state shortfall would be incurred almost entirely by those institutions that did not generate profits during the 2014-2018 period.

Table 22 Evolution of TC shortfall during phase-in implementation of the output floor, under profit retention assumption (EUR billion)

Institutions	Profit retention assumption	1 Jan 2022	1 Jan 2023	1 Jan 2024	1 Jan 2025	1 Jan 2026	1 Jan 2027
Profit-generating institutions	Before retention	48.7	49.0	51.8	58.1	68.2	78.6
	After retention	14.9	5.8	1.1	1.2	1.9	2.2
Zero profit institutions	Before retention	31.4	31.8	36.2	43.0	50.7	56.5
	After retention	31.4	31.8	36.2	43.0	50.7	56.5
All banks	**Before retention**	**80.1**	**80.7**	**88.0**	**101.1**	**118.9**	**135.1**
	After retention	**46.3**	**37.5**	**37.3**	**44.3**	**52.6**	**58.7**

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Notes: Based on a sample of 189 banks. Banks are assumed to retain all their profits from the first date of the phase-in period to cover their shortfall.

Table 23 Evolution of CET1 shortfall during phase-in implementation of the output floor, under profit retention assumption (EUR billion)

Institutions	Profit retention assumption	1 Jan 2022	1 Jan 2023	1 Jan 2024	1 Jan 2025	1 Jan 2026	1 Jan 2027
Profit-generating institutions	Before retention	27.5	27.9	30.6	35.5	44.6	52.2
	After retention	6.0	3.6	1.6	0.9	1.4	1.7
Zero profit institutions	Before retention	20.1	20.4	23.8	29.1	34.6	38.9
	After retention	20.1	20.4	23.8	29.1	34.6	38.9
All banks	**Before retention**	**47.6**	**48.3**	**54.4**	**64.5**	**79.2**	**91.1**
	After retention	**26.1**	**24.0**	**25.4**	**30.0**	**36.0**	**40.6**

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Notes: Based on a sample of 189 banks. Banks are assumed to retain all their profits from the first date of the phase-in period to cover their shortfall.

[29] Alternatively, institutions may choose, inter alia, to rebalance their portfolio or raise external capital. Such behaviours are not considered in this analysis.

[30] It is assumed that the amount of profits available for retention every year for profit-generating institutions equals their 2014-2018 average annual profits.

3.4 Alternative scenarios

63. In accordance with the specification of the Call for Advice, the EBA has investigated the sensitivity of the cumulative impact of alternative Basel III implementation scenarios.

64. The alternative scenarios assessed are the following:

- **CRR2 SME supporting factor**: inclusion in the SA and IRB (as well as in the output floor calculation) of the SME supporting factors envisaged in the November 2016 proposal for amending the CRR (CRR2);[31]
- **ILM = 1**: elimination of the historical loss component in the calculation of the operational risk capital requirement for institutions of Business Indicator buckets 2 and 3;
- **CVA exemptions**: inclusion of the CVA exemptions applied in the current EU regulatory framework;
- **FRTB January 2019 revisions**: proxy for the 2019 revision of the FRTB based on the QIS data collection.[32]

65. The inclusion of the CRR2 SME supporting factor would reduce the contribution of the credit risk reform (both SA and IRB) to the total T1 MRC change by 1.6 p.p. This would lead to the reduction of the impact on the total T1 MRC change by around 1.5 p.p and a reduction of EUR 6.8 billion in the total capital shortfall.[33] The reform of the operational risk framework is highly sensitive to the national discretion to set ILM = 1 (i.e. excluding the historical losses component from the calculation of the ILM). If applied, the impact of the operational risk reform would be more than halved and the total impact in terms of T1 MRC change would be reduced by around 1.2 p.p. The total capital shortfall would decrease from EUR 135.1 billion to EUR 122.8 billion.

66. The implementation of the CVA exemptions in the Basel III framework would decrease the contribution of CVA risk to the total MRC change by almost 3 p.p., which, due to the partial offset of the output floor becoming more binding,[34] reduces the total T1 MRC change by 2.4 p.p. Under this scenario, the total capital shortfall would be reduced by EUR 18.2 billion to EUR 116.9 billion.

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[31] Proposal for a regulation of the European Parliament and of the Council amending Regulation (EU) No 575/2013 from 23 November 2016.

[32] The 2019 FRTB standards have been proxied by: i) reflecting the reductions in risk weights for the general interest rate risk (GIRR) and FX risk classes under the standardised approach and ii) replacing the amount of NMRF capital requirement as reported by each bank with the median value reported within the sample of banks; this amount was reduced by 60% to proxy the impact on NMRF capital requirements. The remaining revisions in the 2019 FRTB standards are not reflected due to data limitations. The final impact of the 2019 FRTB standards will be presented in a supplementary report.

[33] Participating institutions were requested to report both SA and IRB RWA under the alternative scenario in which the CRR2 SME supporting factor is implemented. Where institutions did not report SA and IRB RWA under the alternative scenario, the SA and IRB RWA corresponding to the central scenario were modified by applying the average SME supporting factor discount measured over institutions that reported data for the alternative scenario. The average supporting factor was measured separately for SA and IRB portfolios. The supporting factor was also implemented, where relevant, in the calculation of the output floor.

[34] It should be kept in mind that whenever capital requirements decrease for a risk category that is not eligible for internal models (non-modellable), e.g. CVA or operational risk, the output floor calculation is likely to lead to a higher impact of the output floor. This is because, other things being equal, a higher volume of non-modellable RWA offsets a given gap between internal model RWA and standardised equivalent RWA for market risk and credit risk (conversely, a higher non-modellable requirement may lead to a lower impact of the output floor).

67. Finally, based on some high-level assumptions, applying the market risk capital requirements published by the BCBS in 2019, the fundamental review of the trading book (FRTB) 2019[35], instead of the FRTB 2016[36], would reduce the contribution of the market risk component to the overall percentage MRC change by 1.1 p.p. This reduction will lead to a decrease in the T1 MRC change of 0.5 p.p. and a decrease in the capital shortfall of EUR 4.2 billion.

Table 24 Percentage change in T1 MRC (relative to current T1 MRC) under alternative scenarios

Scenario	Δ SA	Δ IRB	Δ CCP	Δ SEC	Δ MKT	Δ OP	Δ CVA	Δ LR	Δ OF	Δ Total
Central scenario	**2.7**	**2.7**	**0.1**	**0.6**	**2.5**	**3.3**	**3.9**	**-0.5**	**9.1**	**24.4**
CRR2 SME supporting factor	2.0	1.8	0.1	0.6	2.5	3.3	3.9	-0.4	9.2	22.9
ILM=1	2.7	2.7	0.1	0.6	2.5	1.6	3.9	-0.5	9.5	23.2
CVA exemptions	2.7	2.7	0.1	0.6	2.5	3.3	1.1	-0.4	9.5	22.0
FRTB 2019 proxy	2.7	2.7	0.1	0.6	1.4	3.3	3.9	-0.5	9.7	23.9

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Notes: Based on a sample of 189 banks. SA, standardised approach to credit risk; IRB, internal rating-based approach to credit risk; CCP, central counterparty; SEC, securitisation; MKT, market risk; OP, operational risk; CVA, credit valuation adjustment; LR, leverage ratio; OF, output floor.

Table 25 Capital ratios and shortfalls under alternative scenarios

Scenario	CET1			T1			TC		
	Current ratio (%)	Revised ratio (%)	Shortfall (EUR bn)	Current ratio (%)	Revised ratio (%)	Shortfall (EUR bn)	Current ratio (%)	Revised ratio (%)	Shortfall (EUR bn)
Central scenario	**14.4**	**11.5**	**91.1**	**15.3**	**12.3**	**127.5**	**17.9**	**14.3**	**135.1**
CRR2 SME supporting factor	14.4	11.7	87.0	15.3	12.5	120.3	17.9	14.5	128.3
ILM=1	14.4	11.7	82.5	15.3	12.4	115.9	17.9	14.5	122.8
CVA exemptions	14.4	11.8	79.3	15.	12.	111.7	17.9	14.6	116.9
FRTB 2019 proxy	14.4	11.6	88.0	15.3	12.4	123.7	17.9	14.4	130.9

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 189 banks.

3.5 Interaction between RWA, output floor and leverage-driven capital requirements (constraint analysis)

68. With the introduction of the aggregate output floor, the T1 MRC will be determined by the interaction between different regulatory metrics, depending on whether institutions use internal models for the calculation of regulatory capital, as follows:

- **standardised institutions:** the constraining T1 requirement will be the higher T1 requirement of: i) the standardised RWA-based measure of capital and ii) the leverage ratio-based measure of capital;

[35] BCBS (2019), 'Minimum capital requirements for market risk'.

[36] BCBS (2016), 'Minimum capital requirements for market risk'.

- **internal model institutions:** the constraining T1 requirement will be the higher T1 requirement of: i) the internal model RWA-based measure of capital,[37] ii) the floored RWA-based measure of capital, and iii) the leverage ratio-based measure of capital.

69. The constraint analysis looks at the number of institutions in the sample that will be constrained by each of the three different metrics of regulatory capital. In relation to internal model institutions, which are institutions that use internal models in at least one risk area in the Basel III central scenario, this analysis is important as it reveals the extent to which the use of internal models triggers the backstop of either the aggregate output floor or the leverage ratio. The findings are as follows (Table 26 and Table 27):

- Less than 20% of institutions using standardised or internal model approaches are constrained by the leverage ratio in the baseline scenario;

- In the sample of standardised institutions, the institutions constrained by the leverage ratio in the baseline represent around 14% of the standardised RWA. In the revised framework the constraint of standardised institutions changes only slightly, with more institutions being constrained by the RWA-based metric of capital;

- In the sample of internal model institutions, the output floor acts as the predominant constraining metric in the revised framework, where it constrains 51% of them, leaving 43% of the institutions constrained by model RWA and only 6% constrained by the leverage ratio. Internal model institutions constrained by the output floor in the revised framework represent around 70% of internal model RWA in the sample.

Table 26 Number and percentage RWA of standardised institutions constrained by each regulatory metric

Scenario	Number of institutions		Total	% of total RWA	
	RWs	LR		RWs	LR
Baseline	88	22	110	85.9	14.1
Central scenario	93	17		92.1	7.9

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 110 banks.

Table 27 Number and percentage RWA of internal model institutions constrained by each regulatory metric

Scenario	Number of institutions			Total	% of total RWA		
	RWs	LR	OF		RWs	LR	OF
Baseline	63	16	0	79	96.4	3.6	0.0
Central scenario	34	5	40		29.0	0.4	70.7

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 79 banks.

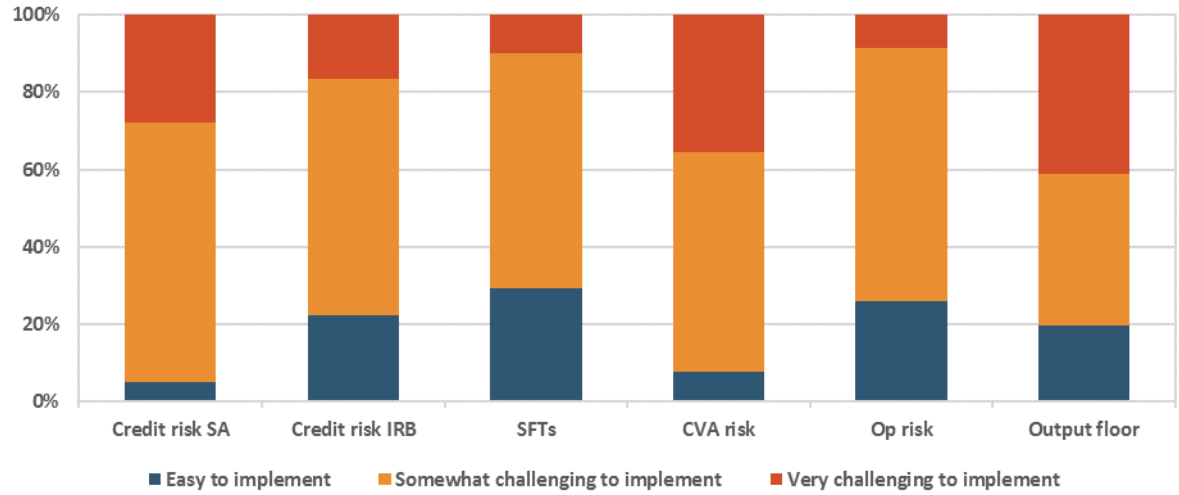
[37] Technically the internal model RWA will be a combination of RWA based on models and on standardised approaches. The extent to which the output floor will be binding will depend on, inter alia, the size and nature of the RWA based on the standardised approaches that are included in the calculation of the internal model RWA.

3.6 Operational and administrative costs

70. Apart from the impact on capital, banks were asked to assess the operational and administrative costs of implementing the reform as part of the qualitative questionnaire.

71. In particular, banks were asked to assess how challenging the implementation of the reform would be. The reforms related to the standardised approach to credit risk, CVA risk and output floor appear to be the most challenging to implement, with 28%, 36% and 41% of the respondents, respectively, expecting them to be very challenging (Figure 5). On the other hand, SFTs and operational risk appear to be the easiest to implement, with almost 30% of the respondents considering that they would be easy to implement, and fewer than 10% that they would be very challenging to implement.

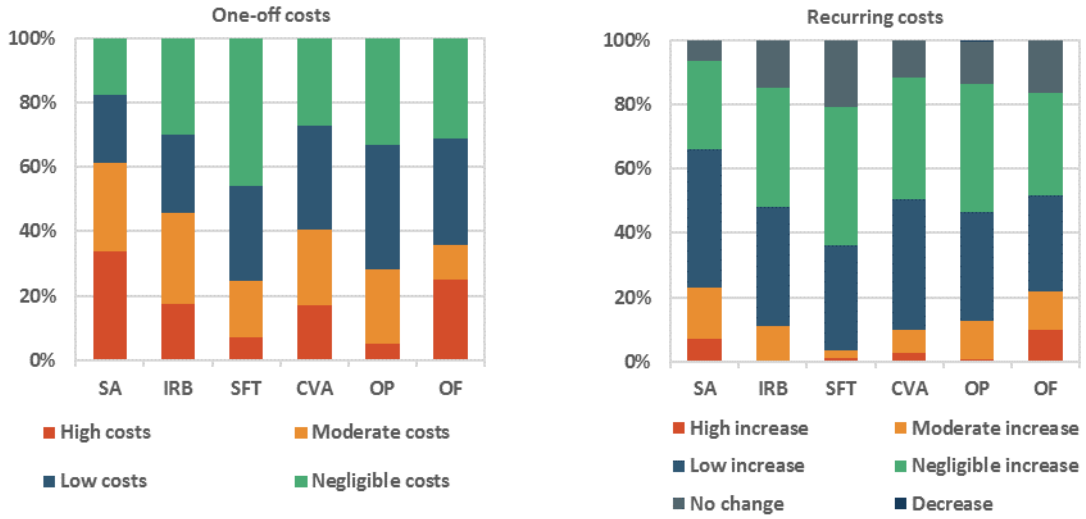
Figure 5 How challenging would the implementation of the final Basel III framework be (% of total responses)



Sources: EBA CfA qualitative questionnaire and EBA calculations.
Note: Based on a sample of 160 banks.

72. Moreover, banks were asked to assess the one-off and recurring costs of implementing the reform for each risk category and by type of costs. Consistent with the previous results, the standardised approach to credit risk and output floor appear to incur the highest one-off costs to implement (Figure 6). However, in terms of recurring costs, most banks are expected to experience low or negligible costs for all risk categories.

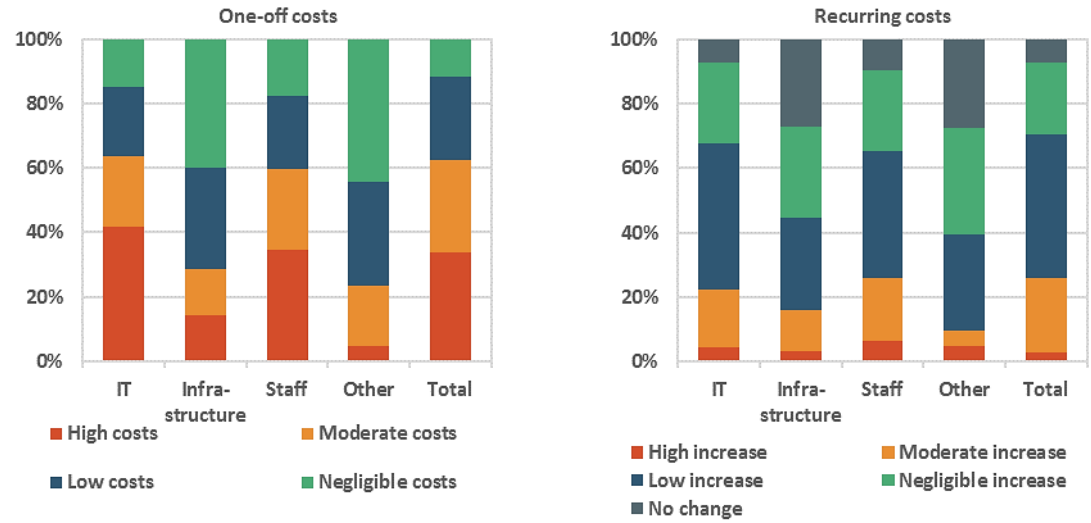
Figure 6 One-off and recurring costs of the final Basel III framework (% of total responses), by risk category



Sources: EBA CfA qualitative questionnaire and EBA calculations.
Note: Based on a sample of 160 banks.

73. Turning to the type of costs, the most prominent one-off costs are expected to be IT and staff costs, while infrastructure (premises, rent, etc.) and other costs appear to be low or negligible (Figure 7). On the other hand, recurring costs appear to be low across all types of costs.

Figure 7 One-off and recurring costs of the final Basel III framework (as % of total responses), by type of cost

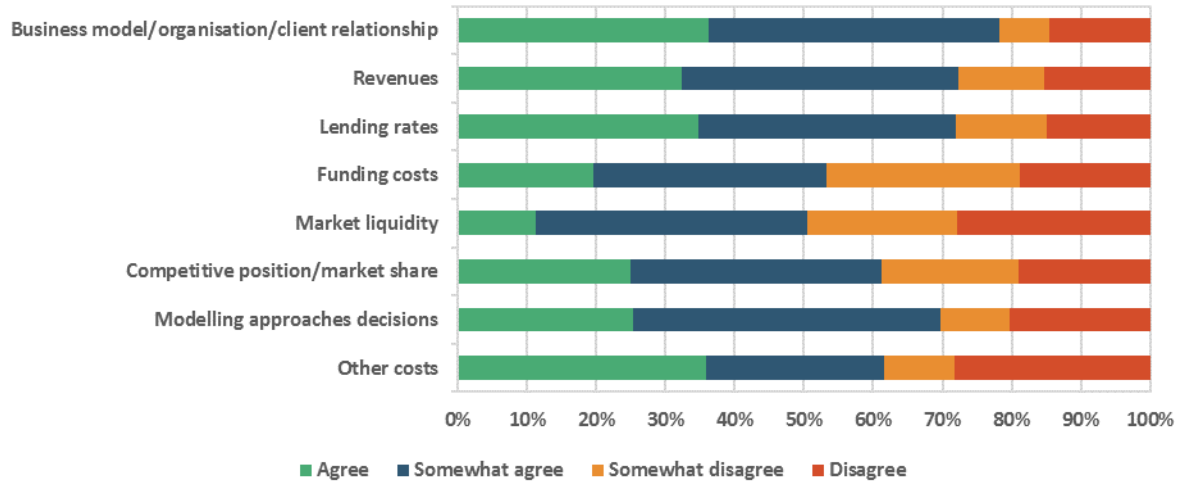


Sources: EBA CfA qualitative questionnaire and EBA calculations.
Note: Based on a sample of 160 banks.

74. The reforms are expected to have a negative impact mostly on banks' business model/organisation/client relationship (in particular for cross border universal banks, domestic universal banks, mortgage banks, automotive and consumer credit banks, savings and loan associations, and cooperative banks), revenues, lending rates and decision to use internal models,

with more than 70% of respondents agreeing or somewhat agreeing (Figure 8). Market liquidity and funding costs are the areas expected to be the least negatively affected.

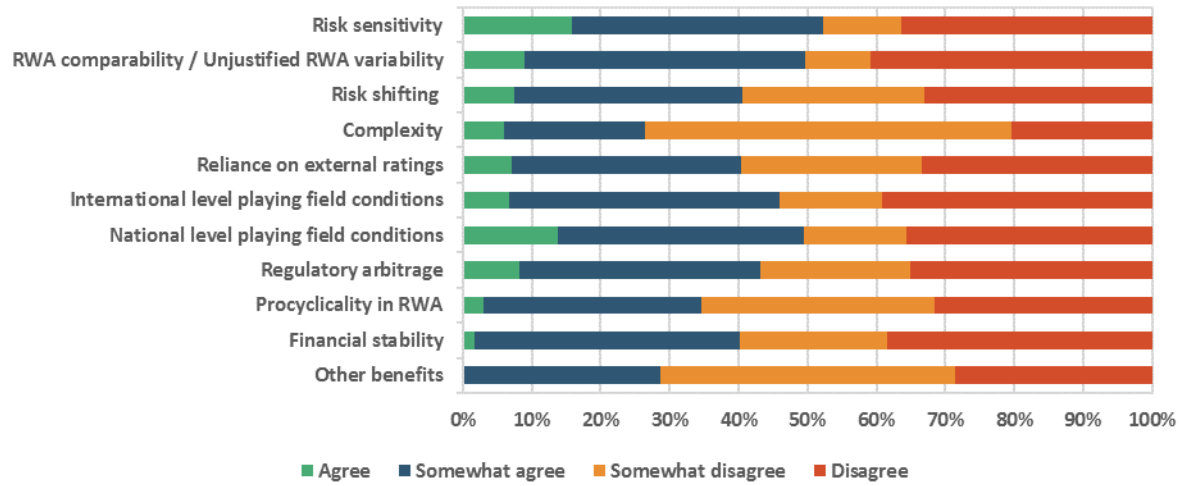
Figure 8 Expected negative impact of the final Basel III framework (% of total responses)



Sources: EBA CfA qualitative questionnaire and EBA calculations.
Note: Based on a sample of 160 banks.

75. Banks generally agree that the reforms will bring the benefits of increased risk sensitivity, increased RWA comparability and more level national and international playing field (Figure 9). However, they disagree that the reforms will reduce complexity and RWA procyclicality.

Figure 9 Expected benefits of the final Basel III final framework (% of total responses)



Sources: EBA CfA qualitative questionnaire and EBA calculations.
Note: Based on a sample of 160 banks.

3.7 Macroeconomic impact

76. The CfA included a request to assess the economic impact of the final Basel III framework. This section describes the analytical framework that is being employed for assessing the costs and benefits of the

finalisation of the Basel III package in collaboration with ECB. The quantitative results of this analysis together with a more detailed description of the methodology will be presented in a supplementary report later this year.

77. The analysis takes an economy-wide approach, with a focus on the real economic implications measured in terms of output growth and lending to the non-financial private sector. The analysis is performed following two alternative approaches. The first rests on a growth-at-risk perspective and employs a large semi-structural model with heterogeneous banks. The approach has multiple advantages but is also new in the literature. For this reason, the second analysis is based on the more traditional Macroeconomic Assessment Group (MAG)/ long-term economic impact (LEI) approach. Both types of analysis are briefly discussed in Box 1. Some qualitative and still tentative conclusions are provided.

Box 1 Macroeconomic impact of final Basel III framework

Growth-at-risk (GaR) approach

The core assessment of economic costs and benefits of the new Basel standards is conducted with a large-scale multi-bank and multi-country model developed by ECB staff.[38] The model captures the behaviour of over 100 of the largest European banks and 24 European Union economies and Norway, while allowing for interactions between the financial sector and the real economy. The model features a high degree of granularity of banks' balance sheets and profit and loss statements, which makes it possible to analyse the complex impact of Basel III directly within a unified set-up. Furthermore, the model makes use of the heterogeneity of banks in European jurisdictions, and of differences in supervisory and macroprudential policies (such as existing Pillar 2 requirements and macroprudential buffers).

The analysis is based on the growth-at-risk perspective whereby the costs and benefits of capital regulation are expressed in the same metrics; namely, the distribution of output and credit growth. The costs of regulation are proportional to the expected moderation of credit and output growth along the median (or expected) path of the economy. The benefits of capital regulation relate to changes in the tails of the credit or output growth distributions. Specifically, the benefits relate to a decrease in economic vulnerabilities, measured in terms of reduced credit and output growth contractions in adverse circumstances thanks to banks' increased resilience due to their higher levels of regulatory capital.

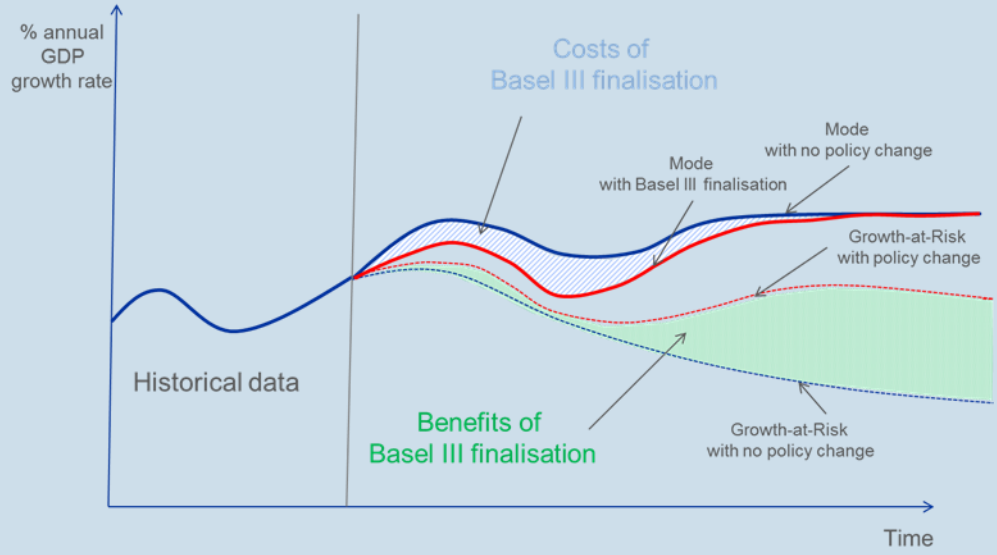
The growth-at-risk approach presents an evaluation of capital regulation within a unified framework. First, it allows a straightforward comparison of costs and benefits. Second, it does not rely on the estimation of extreme events such as systemic crises, which due to the lack of sufficient observations can be difficult to capture precisely. Third, it provides for concurrent estimates of costs and benefits

[38] For a more detailed description of the modelling framework, see Budnik et al. (2019), "Macroprudential stress test for the euro area banking sector", ECB Occasional Paper No. 262.

both along the transition path (when capital requirements increase) and in the new steady state (when the benefits of capital requirements are fully reaped).

The analysis is conducted in two steps. First, the model is simulated with the current regulatory framework under normal economic conditions (using the latest ECB forecasts) and for a large number of positive and adverse scenarios constructed on the basis of historical data (using stochastic simulations). Second, the model is simulated for the same set of baseline and stochastic scenarios but assuming that banks adopt the Basel III finalisation package. In the latter case, Basel III elements affect the reaction of banks and as a consequence the distribution of economic outcomes differs. This allows the comparison of costs and benefits, respectively, derived as the difference between the simulations without Basel III finalisation and the simulations with the Basel III finalisation (Figure 10).

Figure 10 Stylised representation of GaR based cost-benefit assessment



A number of assumptions are employed to map the features of Basel III in the model.[39] For instance, banks with credit risk portfolios for which the use of the A-IRB is phased out are assumed to continue using IRB but to switch to the F-IRB. In addition, the effects of Basel III finalisation related to market risk and to standardised credit risk weights are partially calibrated on the basis of the QIS data collection.

While results for the economic impact analysis using the growth–at-risk framework are still highly preliminary, the current assessment is that the cost of implementing the new Basel standards will have a medium-run character and remain moderate. The gradual phase-in of the output floor would reduce the transition costs even further. At the same time, benefits from higher bank capitalisation should increase over time and have a lasting impact on the resilience of the economy to adverse shocks. Overall, based on preliminary and still tentative results, the finalisation of the Basel package should ensure net benefits for the economy as a whole, in particular over the longer term.

[39] Basel III finalisation specific assumptions supplement regulatory and behavioural constraints already built into the model. For instance, banks' profit distribution is tied to minimum distributable amount (MDA) restrictions and the willingness to preserve their management buffers.

Macroeconomic Assessment Group (MAG)/Long-term economic impact (LEI) approach

The approach is broadly based on methodologies that had been used in the past by the Basel Committee on Banking Supervision.[40]

The main exercise uses historical data on bank capital, output, credit to the non-financial private sector, asset prices and financial crises for 14 countries to estimate the costs and benefits of the changes in the 2018 revisions of Basel capital standards.[41] Such an approach can serve as a complement and robustness check to the more granular GaR analysis presented above, as it relies on a simpler framework that requires fewer assumptions and hence less model structure. At the same time, the aggregated approach cannot study idiosyncratic effects at the bank and sectoral levels.

The methodology first assesses the expected benefits of higher capital requirements resulting from the finalisation of the Basel III package that arise from the reduction in the expected output losses from systemic banking crises (benefit component). Then it compares these benefits with the expected costs of higher capital requirements in terms of forgone output (cost component).

Benefits are estimated as the impact of the higher capital holdings under the revised Basel standards on the probability of an economy residing in a vulnerable state that could lead to a systemic banking crisis.[42] This is done by looking first at how the changes in capital requirements affect credit and economic conditions using a reduced-form macroeconomic model that is based on the historical relationship between the standard macrofinancial variables mentioned above and bank capital ratios. This part is similar to the GaR model mentioned above, albeit at the much more aggregated country level. The change in the new capital requirements is assumed to be adopted by banks over the complete time period until 2027. The reaction by banks affects the other macroeconomic variables over the transition period. This generates a set of scenario paths for all variables in the model. These scenario paths of alternative economic and financial conditions serve as explanatory variables for an early warning model that estimates the probability of being in a vulnerable state under the two capital regimes (pre and post reform). The probability difference between these two regimes is the outcome from the early warning model.

The benefit is then derived from multiplying the probability difference by the average output loss following a systemic banking crisis. This loss is computed from the average loss that was observed as a result of historical systemic banking crises, reduced by a resilience factor stemming from improved

[40] See Macroeconomic Assessment Group, 'Assessing the macroeconomic impact of the transition to stronger capital and liquidity', Final Report, Bank for International Settlements, December 2010. Basel Committee on Banking Supervision, 'An assessment of the long-term economic impact of stronger capital and liquidity requirements', Bank for International Settlements, August 2010 and Fender I., Lewrick, U., 'Adding it all up: the macroeconomic impact of Basel III and outstanding reform', Bank for International Settlements Working Paper No. 591, November 2016.

[41] The analysis covers countries for which sufficiently long historical time series are available. These are AT, BE, DE, DK, ES, FI, FR, GB, GR, IE, IT, NL, PT, SE. Starting dates vary, however, between 1980 and 2000.

[42] The methodology partly uses a variant of the approach presented in Behn, M., Gross, M., and Peltonen, T., 'Assessing the costs and benefits of capital-based macroprudential policy', European Central Bank, Working Paper No 1935, July 2016. The approach combines a VAR model with an early warning model.

capital requirements. The definition of crisis periods is taken from the ECB crisis database.[43] Costs of the new capital requirements in this approach can be derived by referring to the cumulative changes in output in response to the higher capital requirements over the implementation period of the new standards.

Qualitatively, on the benefit side the enhanced resilience of the banking sector should lead to a lower probability of an economy being in a vulnerable state and to lower output losses both supporting a lower expected output loss in the aftermath of a systemic banking crisis. On the cost side, in the short run, output growth might be moderately dampened as banks try to fulfil the new capital standards by lowering credit supply. In the long run, tentative results suggest that the enhanced resilience of the banking sector is likely to reduce the number of systemic banking crises and the size of the ensuing negative real economic impact, thus yielding a net benefit.

[43] See Lo Duca, M.; Koban, A.; Basten, M.;Bengtsson, E.; Klaus, B.; Kusmierczyk, P.; Lang, J. H., 'A new database for financial crises in European countries', edited by Detken, C. and Peltonen, T., European Central Bank, Occasional Paper No 194, July 2017.

4. Credit risk

4.1 Revised standardised approach

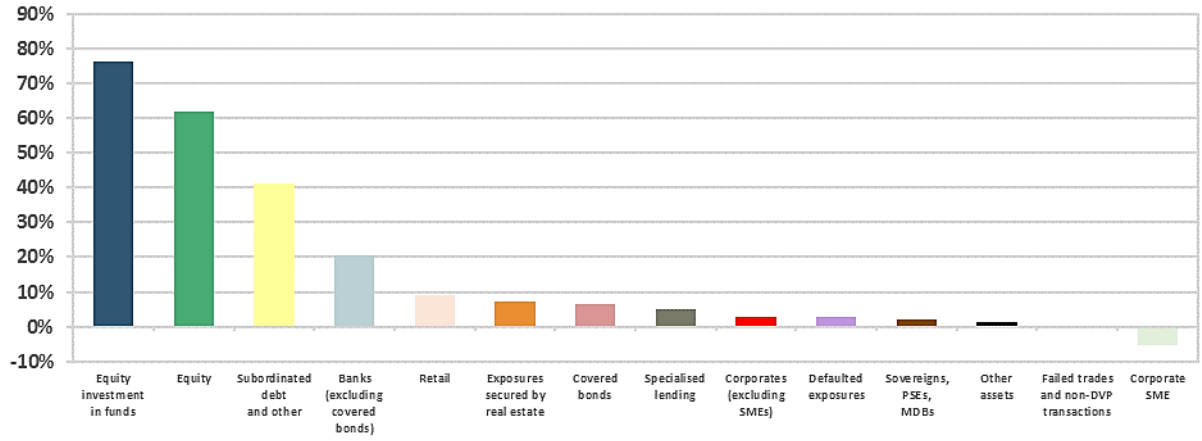
1. The December 2017 agreement aimed to increase the risk sensitivity of the standardised approach. To achieve this, several changes from Basel II were included:

    - the loan-splitting approach, where risk weights differentiate between the secured and unsecured part of the loan, was introduced for exposures to real estate;
    - exposures to income-producing real estate get a standalone risk weight treatment;
    - retail exposures (excluding real estate) are subject to more granular treatment depending on exposure and obligor type;
    - exposures to corporates get recalibrated with a more granular treatment, including specific risk weight for unrated SME exposures;
    - exposure to specialised lending get a standalone treatment, with three sub-exposure classes;
    - exposure to covered bonds get a standalone risk weight treatment;
    - risk weights for rated exposures to banks get recalibrated, unrated exposures get more granular risk weight treatment and due diligence on risk weights is enhanced;
    - subordinated debt and equity get a more granular risk weight treatment depending on the type of exposure;
    - more granular credit conversion factors apply to off-balance-sheet exposures.

4.1.1 Impact of the overall reform

2. Overall the final Basel III rules led to an increase in SA RWA of 8%. On average in the EU, the RWA have increased for all exposure classes within the SA framework, except corporate SMEs (Figure 11). The increase in RWA is highest for the exposure classes equity investment in funds, equity, subordinated debt and banks (excluding covered bonds). For these exposure classes, the increase with respect to current RWA ranges from over 70% (equity investment in funds) to 20% (banks). For the exposure classes retail, secured by real estate, covered bonds and specialised lending, the increase in RWA is between 4% and 10%. The impact is lower for the remaining SA exposure classes, with RWA decreasing from current levels for the exposure class corporate SMEs (-5%).

Figure 11 Percentage change in exposure class SA RWA (relative to current exposure class SA RWA)



Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 181 banks.

3. The following elements should be taken into account:

- **Equity investments in funds:** when the mandate-based approach is used for equity investment in funds, the exposures to funds are risk weighted based on the assets in which the funds themselves invest and are thus subject to the revised risk weights of the corresponding exposure classes.[44] Therefore, the increase in RWA of equity investments in funds partly reflects the increase in other exposure classes' RWA. On the other hand, when the mandate-based approach is not available, the increase in RWA reflects the rise of the risk weight on equity investements in funds exposures from 100% in the current EU framework, to 1250% in the reform scenario of the Basel framework, implemented in the EU through CRR2 entering into application in 2021.

- **Equity:** most exposures are currently risk-weighted at 100% (with higher risk weights if specific conditions apply) and will be risk-weighted at 250% in the revised framework within the 'other equity' sub-category. The newly created sub-categories Speculative Equity (risk weight 400%) and Equity under National Legislated Programmes (risk weight 100%) represent jointly a minor share of the EU equity portfolio under the SA (below 5% in terms of exposure amounts). The impact does not include the changes in RWA due to the intragroup exposures that under Basel III should be deducted from CET1, but are currently risk-weighted under the CRR (see Box 2).

[44] The look-through approach also envisages that exposures to funds are risk weighted based on the assets in which the funds themselves invest and are thus subject to the revised risk weights of the respective exposure classes. However these exposures are reported in the exposure class where they were allocated, hence the impact of these set of exposures cannot be assessed separately.

Box 2 Caveat on the impact of the reform on equity exposures under Article 49 of the CRR

The Basel III framework provides that holdings in the capital of banking, financial and insurance entities outside the scope of regulatory consolidation shall be deducted from CET1 when they exceed certain thresholds.

Under the CRR, those exposures are treated in accordance with Article 49(4) if they satisfy the conditions established in Article 49(1) (for insurance holdings), 49(2) (for intra-group exposures to institutions) and 49(3) (for exposures to institutions that are part of the same institutional protection scheme). Article 49(4) allows institutions to risk weight those exposures in accordance with either the IRB approach or the SA, as applicable.

The Basel III central reform scenario assumes that the risk weighting treatment currently allowed under the CRR will be maintained with the implementation of the revised Basel III framework, with the exposures under consideration becoming subject to the revised SA equity risk weights. However, given that the impact analysis is based on data at the highest level of EU consolidation, the increase in risk weights for intra-group equity exposures is not reflected in the estimates, which may therefore underestimate its impact.

- **Subordinated debt:** most exposures are currently risk-weighted at 100% and will be risk-weighted at 150% in the revised framework.

- **Banks:** the increase in RWA stems exclusively from unrated exposures to banks, reflecting the fact that such exposures can no longer be rated on the basis of the corresponding sovereign and the shift to a grade-based risk weight. RWA for rated exposures decrease slightly, due to the lowering of risk weight applicable to A+/A- rated exposures.

- **Retail:** within the regulatory retail, the revised framework introduces a differentiation between 'transactors' (i.e. obligors in relation to facilities such as credit cards and charge cards where the balance has been repaid in full at each scheduled repayment date for the previous 12 months [45]) and other regulatory retail, applying a 45% risk weight to the former and leaving unchanged the 75% risk weight applicable to the latter. The reform also increases to 100% (from 75%) the risk weight applicable to non-regulatory retail ('other retail'). The increase in RWA stems mostly from regulatory retail other than transactors, which represents more than 90% of the European retail portfolio, but it is driven by policy changes other than the on balance-sheet risk weighting, most notably the introduction of a 10% credit conversion factor for unconditionally cancellable commitments. RWA decrease for transactors and increase for other retail, although on average these two portfolios do not affect significantly the EU-wide impact on retail. The newly defined sub-category of transactors is found to represent only around 4% of the

[45] According to Basel III text, obligors in relation to overdraft facilities would also be considered as transactors if there has been no drawdowns over the previous 12 months.

total retail EU portfolio. Data on transactors were reportedby only four institutions;therefore, results on this sub-category should be interpreted with caution.

- **Covered bonds:** the increase in covered bonds RWA is exclusively due to the significant increase in RWA for unrated covered bonds, despite their minor share in the EU covered bond portfolio (93% of covered bonds being rated in the EU). The revised Basel III framework introduces a preferential treatment for covered bonds, which is broadly similar to the current EU framework. Similarly to the current EU framework, unrated covered bonds are to be risk weighted based on the risk weight of the issuer institution (bank). The higher RWA of unrated covered bonds are a result of an increase of Basel III risk weights for exposures to unrated banks that issued covered bonds, and the fact that such exposures can no longer be rated on the basis of the corresponding sovereign.

- **Exposures secured by real estate:** general residential real estate (GRRE) exposures, which in the EU represents roughly 70% of all exposures secured by real estate, experience a slight decrease in RWA. The average increase for the broad exposure class 'real estate' is driven by material increases associated with the general commercial real estate (GCRE) and the newly introduced sub-categories of income producing residential and commercial real estate (IPRRE and IPCRE). IPRRE is subject to the newly defined whole-loan approach specific to this sub-category, whereas GCRE and IPCRE are subject to a newly defined specific loan-splitting approach applied at national discretion (GCRE) or if the hard test is passed (IPCRE). The exposures secured by real estate now also include a new category, acquisition, development and construction (ADC) exposures towards SPVs and companies, with 150% risk weight. The increase in RWA could come from the different scope of the Basel definition of ADC compared with the 'speculative immovable property financing definition' in the CRR. The latter includes the link to the intention to sell the immovable property for profit.

- **Specialised lending:** the average increase (below 5%) in RWA experienced by the specialised lending portfolio is driven exclusively by a material increase in RWA associated with the newly created sub-category of project finance in pre-operational phase, which is assigned a new risk weight of 130%. This specific category represents around 18% of the specialised lending exposures in the EU. All other newly defined specialised lending portfolios (commodity finance, object finance, project finance in operational phase and project finance high quality) experience a decrease in RWA. It is worth noticing that based on the data received, only 6% of the total EU specialised lending portfolio was identified by respondents as eligible for the newly defined Basel III criteria on high-quality infrastructure lending, which would receive a preferential 80% risk weight (instead of 100%).

- **Corporate non-SMEs**: the impact from RWA is small. The changes in risk-weighting of corporate exposures envisaged by the revised Basel III rules are expected to lead to a decrease in RWA for corporate exposures. These changes include the decrease in the

risk-weight associated with external credit ratings BBB+ to BBB- from 100% to 75%.[46] On the other hand, changes in CRM framework and CCFs are also expected to affect the RWA either positively or negatively, which may explain the increase in the RWA for this exposure class.

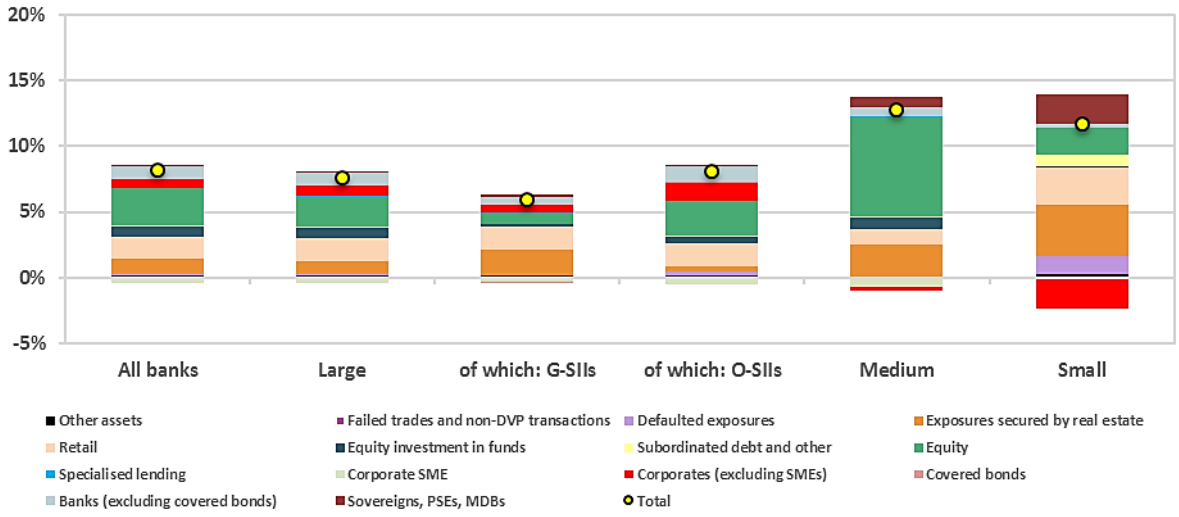
- **Corporate SMEs:** the decrease in RWA associated with this exposure class mostly reflects the newly defined 85% risk weight for unrated corporate SME exposures (instead of 100%), as well as other changes in the revised framework.

4. The findings of the quantitative impact study also show a change in the SA RWA for the sovereign exposure class. Since this variation stems from a very limited number of institutions, it should be interpreted with caution.

5. The following charts/tables illustrate the contribution of each exposure class to the average change in SA RWA, clustering institutions reporting SA exposure by size and complexity (Figure 12) and by business model (Figure 13).

6. The average increase in SA RWA across the EU is approximately 8%. Changes in RWA of exposures to equity, retail and secured by real estate are the largest contributors to the overall SA RWA change. For small institutions, which were mainly affected by increases in SA RWA, the increase is driven by retail and exposures secured by real estate, while in medium firms, the impact is driven by equity exposures. The SA RWA of large institutions has been driven in equal measure by changes in all these three exposure classes.

Figure 12 Percentage change in SA RWA (relative to total current SA RWA), by bank size and exposure class



Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 181 banks: Large (98), of which G-SII (7), of which O-SII (61); Medium (59); Small (24).

[46] In addition, the revised Basel III rules do not envisage the use of the risk-weight of exposures to the central government of the jurisdiction in which the corporate is incorporated, if it is higher than 100%.

7. For more than 80% of the institutions reporting SA exposures, the changes in the standardised approach lead to an increase in SA RWA, of which 25% of the institutions show an increase of more than 15% (Table 28).

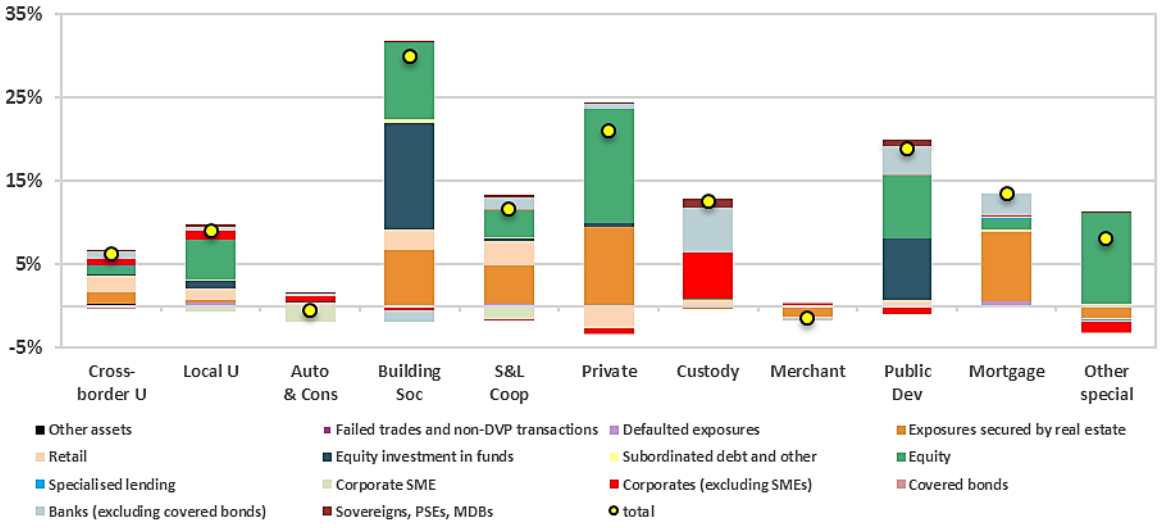
Table 28 Distribution of percentage change in SA RWA (relative to current SA RWA), all banks

Percentile	Percentage
5th percentile	-6.6
25th percentile	0.7
Median	6.1
75th percentile	14.9
95th percentile	37.2

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 181 banks.

8. The contribution of each exposure class to the average change in SA RWA presented by business model breakdown indicates that the equity asset class is the main driver of the impact for a majority of business models. The real estate asset class also has an important impact on some business models such as building societies, cooperative banks, mortgage banks and private banks. The impact of equity investments appears important for building societies, private banks and public development banks. In the case of public development banks the impact is driven solely by one bank, which transferred funds from the mandate-based approach to the fallback approach. For custody banks, the contribution of each exposure class to the average change in SA RWA shows a different pattern. Exposures to banks and corporates excluding SMEs appear the major drivers of the impact for these banks.

Figure 13 Percentage change in SA RWA (relative to total current SA RWA), by business model and exposure class



Sources: EBA 2018-Q2 QIS data and EBA calculations.
Notes: Based on a sample of 196 banks: Cross-border U (36), Leasing* (2), Public Dev (10), Mortgage (8), Other special (11), Local U (61), Auto and Cons (8), Building Soc (5), S&L Coop (34), Private (8), Custody (7), Merchant (5), CCP* (1).

(*) Not shown in the chart due to less than 3 entities in the cluster

9. The results by country show some divergences between the different jurisdictions. The largest increase in SA RWA is observed for Austria and Denmark (over 20%), followed by Luxembourg (17%). The SA RWA increase is above 10% for Italy, Germany and France. For the remaining countries the increase is below the 8% average, with Finland being the only country that registered a decrease in SA RWA.

10. The equity exposure class appears the main driver of impact in the majority of jurisdictions, followed by the exposures secured by real estate and retail:

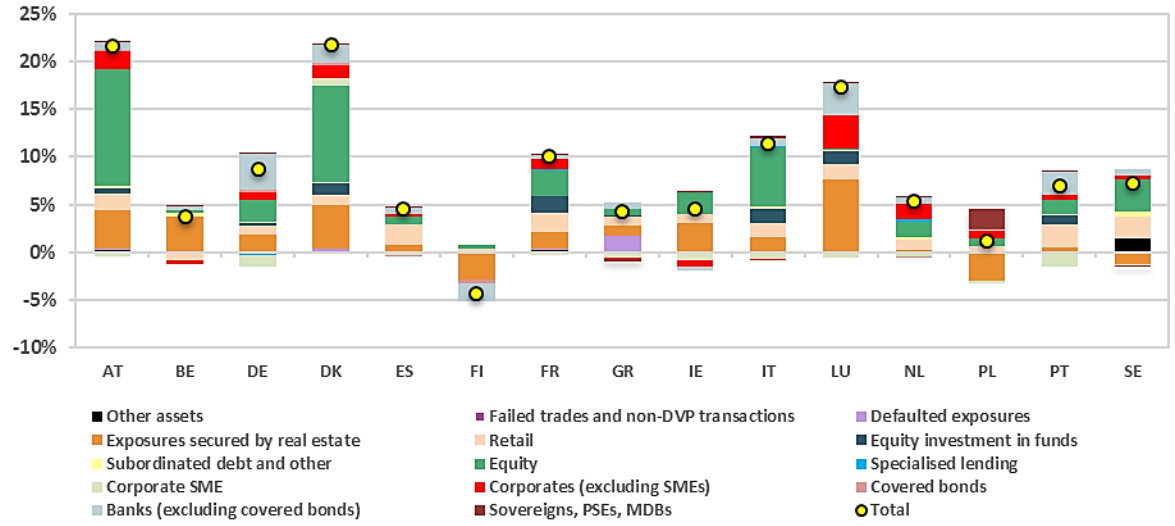
    - Austria and Denmark are the jurisdictions with the greatest impact from the equity asset class. The high impact of equity in Austria is driven by a few banks that hold large amounts of equity due to their specific business models and/or organizational structure. The high impact of equity in Denmark is driven by significant IRB banks whose share of equity exposures over their total balance sheet is not significant, but the contribution of this asset class to their total SA RWA is important. The impact of equity RWA is also large in Italy, Sweden and France.

    - Among EU Member States, Luxembourg, Austria, Denmark and Belgium have the greatest impacts from exposures secured by real estate. This exposure class contributed to a decrease in RWA in Finland, Poland and Sweden.

    - Retail exposures have an impact that is positive and very similar across all Member States, except for Belgium, where its impact is negative, i.e. the RWA have decreased.

11. Germany, Luxembourg and Portugal have a large rise in RWA stemming from increase in RWA for bank exposures. Luxembourg in addition has a large increase coming from corporate non-SME exposures.

Figure 14 Percentage change in SA RWA (relative to total current SA RWA), by country and exposure class



Sources: EBA 2018-Q2 QIS data and EBA calculations.
Notes: Based on a sample of 195 banks: AT (14), BE (8), DE (39), DK (8), EE* (2), ES (10), FI (5), FR (14), GR (4), HR* (2), HU* (1), IE (10), IT (23), LU (5), LV* (2), MT* (1), NL (12), NO (5), PL (12), PT (8), SE (10).
(*) Not shown in the chart because fewer than three entities in the cluster

4.1.2 Individual reforms and scenario analysis

IMPORTANT NOTE: This section aims to shed light on the sensitivity of the impact to individual policy revisions of the SA framework for credit risk. It does so by comparing — in terms of impact on SA RWA — a scenario of full implementation of the Basel III reform (Basel III central scenario) versus alternative scenarios, where each individual revision under consideration is not implemented or calibrated differently (Basel III excluding specific revision). The analysis is based on samples of varying size, depending on the SA revision under consideration, so as to maximise the informative value of the QIS. For this reason, the figures on the impact of the Basel III central scenario in this section are not comparable with the impact figures for the same scenario presented in section 4.1.1. Section 4.1.1 should be considered as reference when it comes to assessing the level impact of the central reform scenario on SA RWA.

ECRA versus SCRA

12. The revised Basel III standards allow jurisdictions to choose between two different frameworks for the standardised approach to credit risk — ECRA and SCRA[47] — by allowing or not allowing, respectively, the use of external ratings for regulatory purposes in the jurisdiction. The choice of framework will have an impact on the method of assigning risk-weights to the following exposure classes:

[47] Note that, in the revised Basel III text, the terms ECRA and SCRA are used only in the case of the exposure class banks. In this report, ECRA was used for all approaches where jurisdictions allow the use of external ratings, and SCRA for all approaches where external ratings are not allowed.

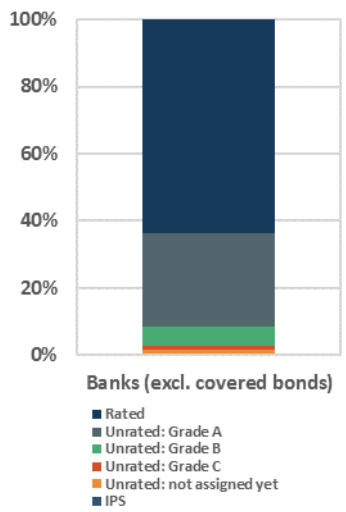
- exposures to banks (excluding covered bonds);
- covered bonds;
- general corporate exposures;
- specialised lending.

13. As the EU currently allows the use of external credit ratings, this section elaborates on the impact of adopting a Basel III SCRA (that is, without external ratings) instead of the target reform scenario, i.e. the Basel III ECRA ("Basel III central scenario") for exposures to banks (excluding covered bonds), exposures to covered bonds and corporate exposures in the European QIS sample. In addition, for corporate exposures only, this section assesses the impact of an approach combining ECRA for rated exposures and SCRA for unrated exposures.

14. **Exposures to banks (excluding covered bonds)** are mostly rated exposures (about 64%). The remaining share of exposures to banks (excluding covered bonds) — approximately 36% — are unrated (Figure 15). Less than 1% of bank exposures are exposures to institutions belonging to the same institutional protection scheme (IPS), which receive a preferential risk weight irrespective of their rating status.

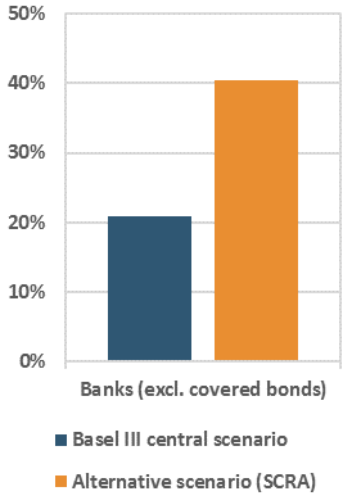
15. For exposures to banks (excluding covered bonds) the SCRA framework would be associated, on average, with higher RWA than the ECRA framework. The RWA of the exposures to banks excluding covered bonds increases by 40% instead of 20% (Figure 16). The contribution of the banks portfolio to the total SA RWA increase would approximately double under the SCRA framework (from about 0.8% to about 1.6%) (Figure 17).

Figure 15 Breakdown of exposures to banks (excluding covered bonds) by rating status (% of exposures to banks excluding covered bonds)



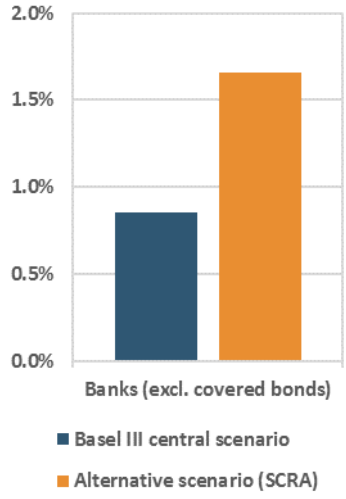
Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 67 banks.

Figure 16 Percentage change in exposures to banks (excluding covered bonds) SA RWA (relative to current exposure class SA RWA), ECRA versus SCRA



Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 67 banks.

Figure 17 Percentage change in exposures to banks SA RWA (relative to total current SA RWA), ECRA versus SCRA

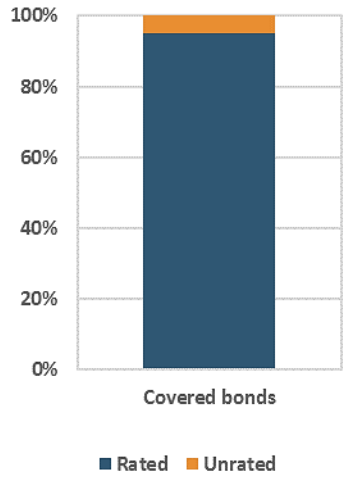


Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 67 banks.

16. **For covered bonds**, the revised Basel standard does not envisage two possible approaches, ECRA and SCRA. Instead, it provides the risk weights for rated covered bonds based on issue-specific external ratings, and risk weights for unrated external covered bonds based on issuer (bank) external rating. Almost all exposures to covered bonds benefit from an external rating (Figure 18). Therefore, the impact from the implementation of SCRA normally would stem only from the small proportion of unrated covered bonds for which the issuer rating will be used.

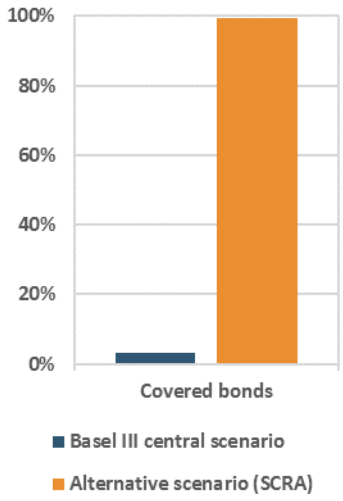
17. In this section, however, the impact is assessed for the case when the risk weights for unrated covered bonds also applies to the rated ones. Implementing the risk weights in this way would strongly amplify the increase in RWA for exposures to covered bonds. RWA of the covered bonds exposure class will increase by almost 100%, compared with a very small increase in the central scenario (Figure 19). The contribution of covered bonds to the total increase in SA RWA would increase by about 30 times, from 0.01% to 0.3% (Figure 20).

Figure 18 Breakdown of exposures to covered bonds by rating status (% of exposures to covered bonds)



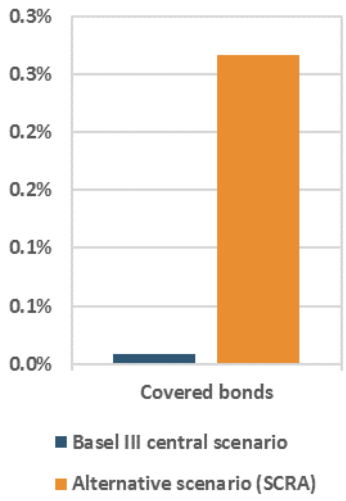
Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 87 banks.

Figure 19 Percentage change in exposures to covered bonds SA RWA (relative to current exposure class SA RWA), ECRA versus SCRA



Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 87 banks.

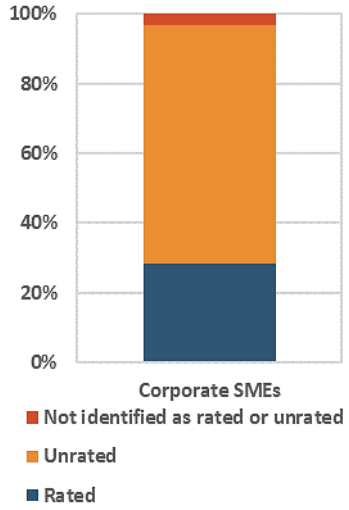
Figure 20 Percentage change in exposures to covered bonds SA RWA (relative total current SA RWA), ECRA versus SCRA



Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 87 banks.

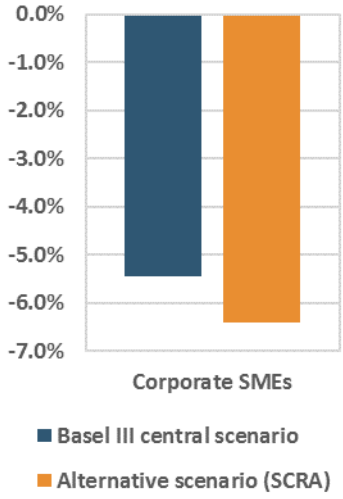
18. The impact of the ECRA versus SCRA approach is analysed separately for non-SME and SME corporate exposures. Only about 30% of the exposures to **corporate SMEs** are rated in the sample (Figure 21). For this type of exposures, the implementation of the reform under the SCRA framework, which implies a flat risk-weight of 85%, would be associated with a slightly more pronounced fall in RWA than under the ECRA, whereby rated corporate SMEs will be assigned risk-weights based on their external rating (Figure 22 and Figure 23). Considering the risk weights for unrated SMEs under ECRA/SCRA, the variation of RWA between ECRA and SCRA is probably due to SMEs that are externally rated below BB+ (RW 100% and above) and which receive a more favorable flat RW of 85% under the SCRA.

Figure 21 Breakdown of exposures to corporate SMEs by rating status (% of exposures to corporate SMEs



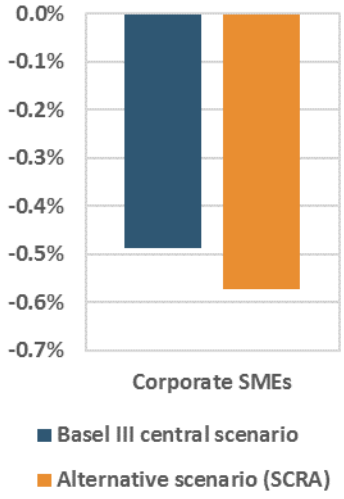
Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 125 banks.

Figure 22 Percentage change in exposures to corporate SMEs SA RWA (relative to current exposure class SA RWA), ECRA versus SCRA



Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 125 banks.

Figure 23 Percentage change in exposures to corporate SMEs SA RWA (relative to total current SA RWA), ECRA versus SCRA



Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 125 banks.

19. The QIS figures indicate that only about 20% of **non-SME corporate exposures** are rated (Figure 24).[48] In the case of these exposures, the SCRA framework would lead to a reduction in SA RWA, as opposed to the increase in SA RWA resulting from the ECRA central reform scenario. The contribution of the exposure class to the total average increase in SA RWA would shift from around +0.2% to -0.6% (Figure 27).

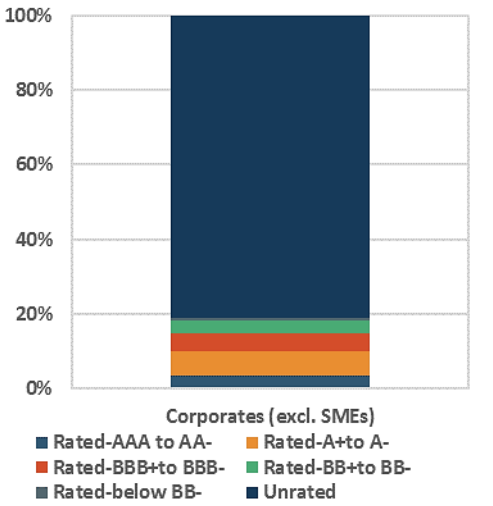
20. In addition, 80% of respondents for the qualitative questionnaire consider that the implementation of SCRA would result in a similar or lower risk sensitivity as compared to the continued use of the ECRA. This result varies marginally as a function of the size of the institution, at 71% for small institutions compared with 83% for medium-sized institutions. These results are also robust with regard to the classification into business models.

21. In jurisdictions where external ratings are not allowed, and hence SCRA applies, banks are allowed to provide a preferential rate of 65% to 'investment grade' corporates.[49] The QIS evidence is that around 30% of non-SME corporate exposures can be classified as investment grade, which would contribute to lower capital requirements (Figure 25).

[48] It can be noticed that exposures to non-SME corporates are less frequently externally rated than exposures to SME corporates, which may seem counterintuitive. The result however is driven by French banks, where a large share of SMEs are rated by Banque de France.

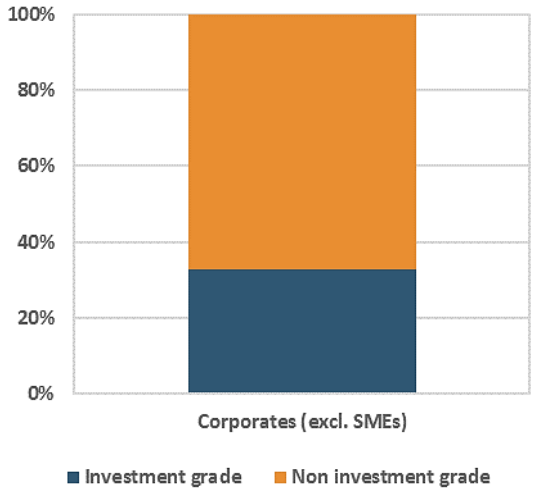
[49] 'An investment grade is a corporate entity that has adequate capacity to meet its financial commitments in a timely manner and its ability to do so is assessed to be robust against adverse changes in the economic cycle and business conditions'. See paragraph 42 on page 13 of BCBS (2017), 'Finalising post-crisis reforms'.

Figure 24 Breakdown of exposures to corporates (excluding SMEs) by rating status (% of exposures to corporates excluding SMEs)



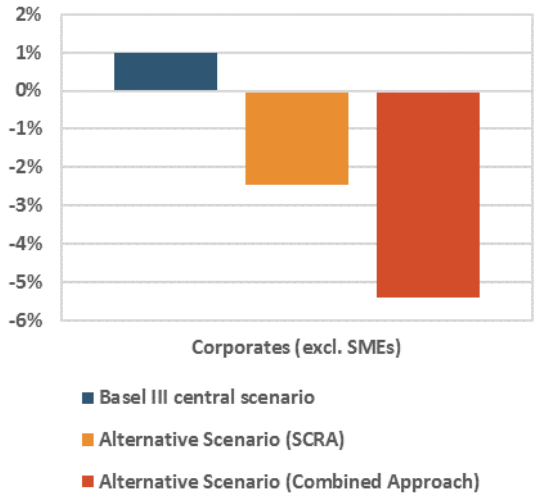
Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 58 banks.

Figure 25 Breakdown of exposures to corporates (excluding SMEs) by grade (% of exposures to corporates excluding SMEs)



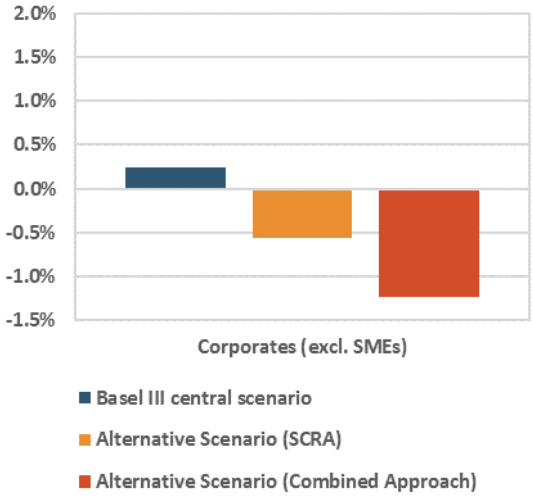
Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 58 banks.

Figure 26 Percentage change in exposures to corporate (excluding SMEs) SA RWA (relative to current exposure class SA RWA), ECRA versus SCRA



Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 58 banks.

Figure 27 Percentage change in exposures to corporate (excluding SMEs) SA RWA (relative to total current SA RWA), ECRA versus SCRA



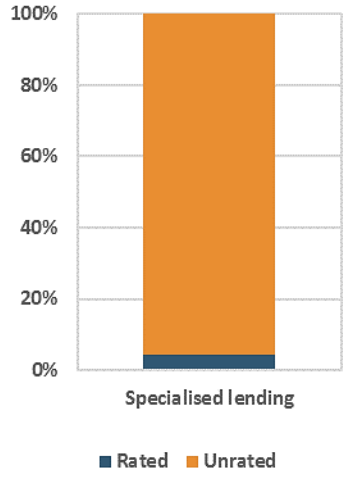
Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 58 banks.

22. As requested in the Call for Advice, this report also includes an assessment of the impact of implementing an ECRA-SCRA combined policy framework for non-SME corporate exposures, whereby rated exposures would be treated under the ECRA framework and unrated exposures would be treated under the SCRA framework. The impact of such a combined policy framework on the non-

SME corporate portfolio would be a pronounced decrease in RWA with respect to the baseline, contrasting with the slight increase that is measured under the ECRA (Basel III central scenario) and a less pronounced decrease under the SCRA.

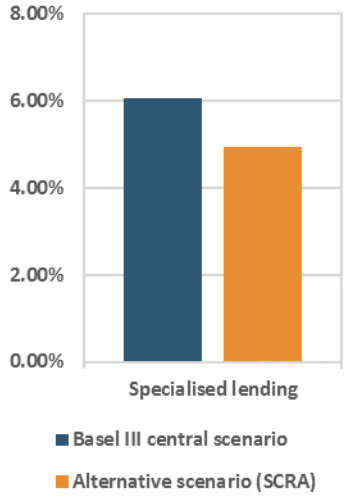
23. As regards **specialised lending** exposures, the vast majority of those reported in the sample are unrated (Figure 28). The implementation of both ECRA and SCRA would result in approximately the same increase in RWA for the portfolio under consideration, since only a few projects benefit from issue-specific external ratings. (Figure 30).

Figure 28 Breakdown of exposures to specialised lending by rating status (% of specialised lending exposure class)



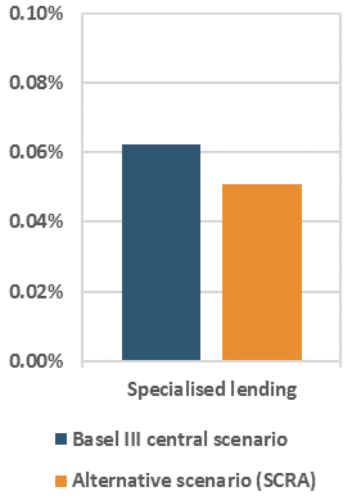
Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 165 banks.

Figure 29 Percentage change in exposures to specialised lending SA RWA (relative to current exposure class SA RWA), ECRA versus SCRA



Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 165 banks.

Figure 30 Percentage change in exposures to specialised lending SA RWA (relative to total current SA RWA), ECRA versus SCRA



Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 165 banks.

SME supporting factor

24. The CRR applies a supporting factor to eligible exposures to SMEs, under both the SA and IRB frameworks. Such capital treatment is included in the baseline scenario considered in this report, as it is part of the current national implementation of the Basel II standards (Table 29). The supporting factor is not part of the Basel III standards and hence is not included in the central reform scenario. Instead, the revised Basel III standards introduce a preferential treatment of 85% risk weight for unrated exposures to corporate SME exposures under the SA. This preferential SA treatment is included in the Basel III central reform scenario considered in this report.

Table 29 Preferential treatment of exposures to SMEs: CRR, CRR2 and final Basel III framework

Framework	CRR	CRR2*	Final Basel III framework

Capital treatment	0.7619 factor applied to capital requirement	0.7619 factor applied to RWA on part of exposure to SMEs up to **EUR 1.5 million****	85% risk weight (instead of 100%)	75% risk weight
Eligible exposures	Exposures to SMEs up to EUR 1.5 million	All exposures to SMEs	All unrated exposures to corporate SMEs under SA	All regulatory retail SME exposures under SA

Notes:
* Proposal for a regulation of the European Parliament and of the Council amending Regulation (EU) No 575/2013 from 23 November 2016.
** The final CRR2 adopted in June 2019 increases this threshold from EUR 1.5 million to EUR 2.5 million. In addition, SME exposures above the threshold are subject to a reduction of capital of 15% (i.e. a de facto 85% risk weight).

25. The new CRR2 regulation will change the existing rules on the SME supporting factor, widening its scope of application and modifying its calibration. The proposed changes, according to which a 23.8% reduction in terms of capital requirements would apply up to EUR 1.5 million of loans granted to SMEs, are included in neither the baseline nor the central reform scenario of the impact analysis included in this report. Instead, two alternative scenarios — alternative baseline and alternative central reform scenario — were designed to take into account the modified SME supporting factor.[50]

26. This section of the report looks at the impact of these alternative baseline and reform scenarios concerning the implementation of preferential treatments for exposures to SMEs in the standardised approach.

27. Table 30 lists all the scenarios considered and provides the description of each scenario. The first comparison is between the Basel III central scenario (scenario C in Table 30) and an implementation of the Basel III standards which also includes the CRR2 rules on the SME supporting factor (scenario D in Table 30). Both scenarios are assessed against a consistent baseline scenario, which includes the currently applicable CRR rules on the SME supporting factor (scenario A in Table 30).

Table 30 Scenario specification for assessment of the impact of the SME supporting factor

Scenario		Description
A	**CRR baseline**	Current national implementation of the Basel framework (i.e. CRR)
B	**CRR2 proposal baseline**	Current national implementation of the Basel framework (i.e. CRR) modified to include the CRR2 proposal rules on the SME supporting factors
C	**Basel III central scenario**	Basel III standards on SME exposures
D	**Basel III + CRR2 proposal SF scenario**	Basel III standards on SME exposures modified to include the CRR2 proposal rules on the SME supporting factors

[50] The estimates presented here are likely to underestimate the effects of the SME supporting factor, as they are based on the SME definition as per the November 2016 proposal for amending the CRR, according to which a 23.8% reduction in terms of capital requirements would apply up to EUR 1.5 million of loans granted to SMEs. In this report, the EUR 1.5 million threshold was used because, when the quantitative impact study was prepared, the final CRR2 was not yet available. The final CRR2 will increase this threshold from EUR 1.5 million to EUR 2.5 million. In addition, SME exposures above the threshold will still be subject to a reduction, which will amounts to 15% (i.e. a de facto 85% risk weight).

28. As a general result, it should be noted that around 20%-25% of the exposures in the corporate and retail portfolios appear to be eligible for the CRR2 SME supporting factor. The application of that supporting factor would substantially mitigate the impact of the SA reform of the exposure classes under consideration.

29. In relation to exposures to SMEs in the corporate exposure class:

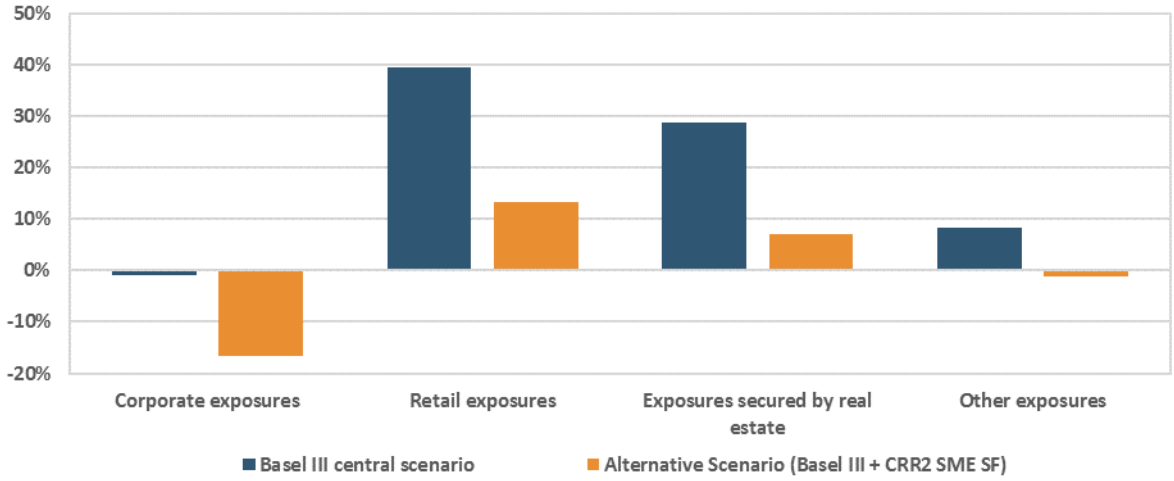
- About 22% of the corporate exposures are reported as compliant with the CRR2 eligibility criteria for the supporting factor, whereas only 6% are compliant with the CRR eligibility criteria for the supporting factor (Figure 31).

- Applying the CRR2 SME supporting factor to the Basel III central scenario would lead to a further decrease in RWA for the corporate exposure class about 20 times as large as the RWA decrease in the Basel III central reform scenario. The RWA of corporate exposure class will decrease by -16.5% instead of -0.8% (Figure 32), while the overall SA RWA will decrease by -1.2% instead of -0.06% (Figure 33).

Figure 31 Share of exposures compliant with the eligibility criteria for SME supporting factor (% of exposure classes corporate, retail, secured by real estate and other under final Basel III framework)

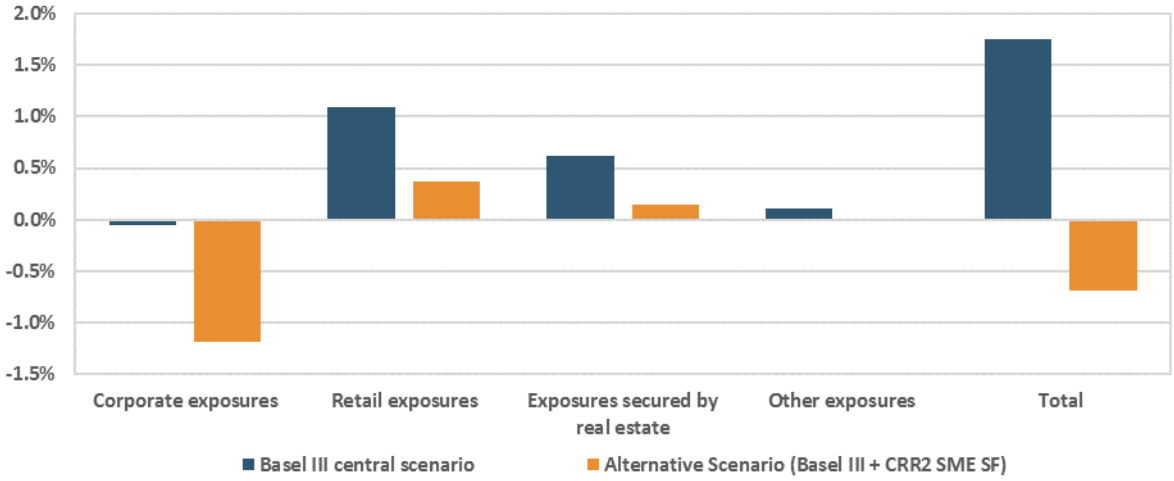
Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 94 banks.

Figure 32 Percentage change in exposure class RWA due to application of SME supporting factor (relative to current exposure class SA RWA)



Sources: EBA 2018-Q2 QIS data and EBA calculations.
Notes: Based on a sample of 94 banks. SME SF, SME supporting factor.

Figure 33 Percentage change in exposure class RWA due to application of SME supporting factor (relative to total current SA RWA)



Sources: EBA 2018-Q2 QIS data and EBA calculations.
Notes: Based on a sample of 94 banks. SME SF, SME supporting factor.

30. In relation to exposures to retail SMEs:

- About 21% of the retail exposures are reported as compliant with the CRR2 eligibility criteria for the supporting factor, whereas 18% are compliant with the CRR eligibility criteria for the supporting factor (Figure 31).

- Applying the CRR2 SME supporting factor would mitigate the increase in RWA for the retail exposure class by about 66%. The RWA of retail exposure class will increase by 13.2% instead of 39.4% (Figure 32), while the overall SA RWA will increase by 0.4% instead of 1.1% (Figure 33).

31. As regards exposures to SMEs that are secured by real estate collateral:

- About 15% of the exposures secured by real estate are reported as compliant with the CRR2 eligibility criteria for the supporting factor, whereas 5% are compliant with the CRR eligibility criteria for the supporting factor (Figure 31).

- Applying the CRR2 SME supporting factor would mitigate the increase in RWA for the exposure class by about 75%. The RWA of exposure secured by real estate will increase by 7.1% instead of 28.9% (Figure 32), while the overall SA RWA will increase by 0.2% instead of 0.6% (Figure 33).

32. Overall, within the exposure classes eligible for the SME supporting factor (corporate, retail and secured by real estate), the application of the CRR2 SME supporting factor more than compensates for the increase of RWA due to the Basel III SA reforms, leading to an overall decrease in RWA (Figure 33).

33. The second type of analysis takes into account an alternative baseline scenario, defined as the national implementation of the Basel framework at the reporting date (i.e. the CRR), modified to include the CRR2 SME supporting factor (scenario B in Table 30). This reflects the fact that, when the revised Basel III standards will be implemented in the EU at their steady state calibration, the CRR2, including the new rules on the SME supporting factor, will be already in force. It is therefore relevant to assess the impact of the finalised BCBS standards on a baseline regulatory framework that more closely resembles the actual EU framework at the date of implementation.

34. Against the alternative CRR2 baseline scenario, two different scenarios of implementation of the revised Basel III standards are assessed: i) the Basel III central reform scenario (scenario C in Table 30) and ii) the central scenario incorporating the CRR2 SME supporting factor (scenario D in Table 30). The results of these assessments are presented in Annex 2.

Infrastructure lending supporting factor

35. The CRR2 regulation introduces a 0.75 supporting factor applicable to the own funds requirement on exposures to infrastructure projects[51], treated under both SA and IRB, that are compliant with a list of requirements aimed at reducing the projects' risk profile and enhance the predictability of their cash flows (Art. 501a of the CRR2). This regulatory treatment is not part of the baseline scenario considered in this impact analysis, nor is it part of the central reform scenario (Basel III central reform scenario).

36. The SA regulatory treatment of project finance exposures included in the Basel III central reform scenario is described in the Basel III revised standards, differentiating between exposures in pre-

[51] Exposures to entities that operate or finance physical structures or facilities, systems and networks that provide or support essential public services.

operational and operational phases and, within the latter category, providing a preferential treatment for high-quality exposures (Table 31).

Table 31 Preferential treatment of exposures to infrastructure projects: CRR2 and final Basel III framework

Framework	CRR2	Final Basel III framework
Capital treatment	0.75 supporting factor on own funds requirement	Risk weight 80% (instead of 100%)
Eligible exposures	Infrastructure projects under certain conditions (Art. 501(a) of the CRR2)	SA unrated operational phase high-quality project finance (paragraph 48 of BCBS Dec 2017 standards)

37. This section of the report looks at the impact of alternative baseline and reform scenarios concerning the implementation of preferential treatments for exposures to infrastructure projects.

38. The first comparison is between the Basel III central scenario (scenario B in Table 32) and an implementation of the Basel III standards that also includes the CRR2 agreed rules on the project finance supporting factor (scenario C in Table 32). Both scenarios are assessed against the baseline CRR scenario consistently adopted in this report (scenario A in Table 32).

Table 32 Scenario specification for the assessment of the impact of infrastructure lending supporting factor

	Scenario	Description
A	**Baseline CRR scenario**	CRR framework
B	**Basel III central scenario**	Basel III standards on project finance exposures
C	**Basel III + CRR2 SF scenario**	Basel III standards on project finance exposures and CRR2 infrastructure projects supporting factor rules

39. Although the infrastructure lending supporting factor in theory can apply to any exposure class, the impact analysis in this report is limited to the exposures classes non-SME corporate, SME corporate and specialised lending, which are most likely to have exposures eligible for this treatment.

40. The data from the QIS sample shows that very few exposures from the SA corporate and corporate SME portfolios are compliant with the eligibility criteria of the infrastructure projects supporting factor – 0% and 1% compliant exposures respectively. In the case of specialised lending, 10% of exposures were found to be compliant with the respective eligibility criteria.

41. When implemented as part of the Basel III revised framework the infrastructure projects supporting factor would decrease the average impact of the reform for the portfolios under consideration. Results are not shown in this report, and should be interpreted with caution, as they are exclusively driven by five institutions that identified compliant exposures within their portfolios. For the same reason additional analysis using CRR2 as a baseline scenario was not conducted.

Equity — impact based on the current CRR and revised Basel classification of equity exposures and phase-in implementation

42. This section aims to measure the impact of the revised Basel III standards and phase-in arrangements on the RWA of equity exposures using the current CRR and revised Basel III equity classification.

43. The current framework distinguishes different subcategories of equities:

- Equity exposures currently classified as 'high-risk items' under Article 128 of the CRR. This exposures are currently risk-weighted at 150%.

- Holdings of own funds instruments that are currently risk-weighted in accordance with Article 49(4) of the CRR. Article 49(4) states that, under certain conditions, holdings in insurance companies (Article 49(1)), intra-group exposures (Article 49(2)) and exposures to institutions that are part of the same institutional protection scheme (Article 49(3)) may be risk-weighted according to the SA or IRB approach. Under the SA, this means that most of these equity exposures are currently risk-weighted at 100% (with higher risk weights under very specific conditions).

- 'Other equity', risk-weighted at 100%.

44. The revised Basel III standards on the standardised approach to credit risk introduce three new sub-classes of equity exposures that are subject to different risk-weights. These new sub-classes of equity exposures are:

- 'Speculative unlisted' equity exposures are considered as potentially riskier and are risk-weighted at 400%.

- 'Equity holdings made pursuant to national legislated programmes' are applied a preferential risk-weight (100%) as only equity exposures under certain conditions that could limit the risk of the investment can be considered under this category.

- 'Other equity' exposures that do not fall under any of these categories are assigned a general risk-weight of 250%.

45. Table 33, panel A, shows the impact of the revised Basel III rules, including the breakdown according to the three new categories of equity exposures and introducing the revised risk-weights.[52] The evidence from the QIS sample shows that the equity impact arises mainly from the category 'other equity', in which most institutions concentrate their equity exposures. The data shows no impact for the category 'equity holdings made pursuant to national legislated programmes'. This result stems from only a very limited number of institutions reporting this type of exposure.

[52] Data for the revised classification are the same as in

Table **103**.

46. Table 33 also shows in panel B the impact over the total SA RWA for equity exposures classified according to the current CRR classification: 'high-risk items', holdings of own funds instruments risk-weighted in accordance with Article 49(4) of the CRR and other equity exposures. The QIS data are collected on a consolidated basis, so the quantitative impact of the Basel III standards for intra-group exposures under Article 49 (4) of the CRR cannot be measured within this report. The bucket 'other equity exposures' includes all those exposures that are not high risk items, holdings in insurance companies or exposures to institutions from the same institutional protection scheme.

47. Similar to the revised Basel III classification, the RWA for total equity exposures increases by 2.8% as a result of the Basel III. The largest increase in RWA comes from 'other equity exposures (1.3%), followed by holdings in own funds instruments in insurance companies (0.8%) and 'high-risk items' (0.7%).

Table 33 Percentage change in equity RWA (relative to total current SA RWA), by equity category

Panel A Equity categories classified according to the revised Basel III	Change (%)
Exposures to certain legislative programmes	0
Other	2.6
Speculative unlisted	0.2
Total equity	**2.8**

Panel B Equity categories classified according to current CRR	Change (%)
Equity exposures classified as 'high-risk items' under Article 128	0.7
Holdings of own funds instruments that are currently risk-weighted in accordance with Article 49(4)	0.8
of which: holdings in insurance companies	0.7
of which: exposures to institutions part of the same institutional protection scheme	0.1
Other equity exposures	1.3
Total equity	**2.8**

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 181 banks.

48. Regarding the implementation of the revised risk-weights, the Basel III text includes a five-year linear phase-in arrangement from the date of implementation of the Basel III standards. The risk weights that are applicable during the five years after the implementation of the standards are shown in Table 34. For 'equity holdings made pursuant to national legislated programmes' no phased-in arrangements are envisaged.

Table 34 Risk weights applicable to equity exposures during the phased-in implementation of the Basel standards

Equity category	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
Speculative unlisted	100%	160%	220%	280%	340%	400%
Exposures to certain legislative programmes	100%	100%	100%	100%	100%	100%
Other	100%	130%	160%	190%	220%	250%

49. Table 35[53] shows the impact of the phased-in implementation of the equity risk-weights on the overall SA RWA within the six-year window allowed in the envisaged phased-in arrangements.

50. Phase-in arrangements are designed specifically to address sharp increases in own funds requirements. The impact shown in Table 35 should be read in conjunction with the EBA policy recommendation for the implementation of the phased-in arrangement for equity exposures.

Table 35 Percentage change in equity RWA (relative to total current SA RWA) during the phased-in implementation period

Equity Category	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
Speculative unlisted	0.0	0.0	0.1	0.1	0.2	0.2
Exposures to certain legislative programs	0.0	0.0	0.0	0.0	0.0	0.0
Others	-1.6	-0.8	0.0	0.8	1.7	2.5
Total equity exposures	**-1.6**	**-0.8**	**0.1**	**1.0**	**1.8**	**2.7**

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 181 banks.

51. This section also aims to measure the sensitivity of equity exposures to different risk-weights of equity exposures under Article 49 (4) of the CRR. The scope of the risk-weight sensitivity is limited to these exposures because, among equity exposures, these are the only sub-groups for which risk weights are not clearly defined, since according to Basel rules, these exposures should be deducted from CET1. Two scenarios have been analysed:

    - scenario 1: application of the current SA risk weights;
    - scenario 2: application of a 250% risk weight to all equity exposures under Article 49 (4).

52. Scenario 1 will be translated into no impact for exposures that are currently subject to the standardised approach. Nevertheless, an impact may arise for those equity exposures currently subject to the IRB approach that move to the standardised approach. This impact is shown in the IRB section.

53. For scenario 2 a risk weight of 250% has been applied to the SA equity exposures reported by the institutions participating in the QIS. This results in the impact assessed for the general target scenario (Table 33).

Exposures secured by real estate — whole-loan versus loan-splitting approach

54. The revised Basel III standards on the standardised approach to credit risk introduce new classes of exposures secured by real estate, in order to increase the risk sensitivity of the regulatory treatment of these exposures:

[53] The impact shown in Table 35 for year 5 shows the impact results after imposing the specific risk-weights for each equity category to the QIS standardised approach exposures. Results in Table 33 show the revised results as reported by the participating institutions.

- **IPRRE** and **IPCRE** are introduced in order to differentiate income producing real estate exposures, whereby the repayment mostly depends on the cash flows generated by the property, from **GRRE** and **GCRE**, whereby the repayment does not depend on the cash flows generated by the property.

- **Land ADC** is introduced in order to capture specific risks related to financing properties which are not yet ready to be used.

55. The new standards specify that exposures secured by either residential or commercial real estate, irrespective of whether the real estate is of the general or income-producing type, are to be risk-weighted in accordance with the exposures' loan-to-value (LTV) ratio, following a mapping of LTV bands into risk weights, which is also called the **whole-loan approach**.

56. The revised standards also provide that — at jurisdictional discretion — supervisors may allow a risk-weighting approach that uses different risk weights on the portion of the exposure secured by real estate below and above a given LTV threshold. This approach, also called the **loan-splitting approach,** would apply to GRRE and GCRE. It can also apply to IPCRE provided that specific conditions on the loss performance of the exposures are met at national level; this is called the hard test requirement[54]. A version of this approach is currently applied in the EU based on the CRR. Unlike Basel, in the EU the hard test is applied to both RRE and CRE.

57. Despite the difference in scope, the loan splitting approach from the final Basel III framework closely mimics the regulatory framework currently applicable in the EU. Therefore, the Basel III central reform scenario used throughout this report includes the use of the loan-splitting approach for GRRE and GCRE, as well as the implementation of the hard test requirement for IPCRE (Table 36). As required in the Call for Advice, this report also measures the impact of applying the whole-loan approach across the classes of exposures secured by real estate (Table 36).

Table 36 Scenario specification for real estate exposures

Exposure type	Basel III central reform scenario	Alternative scenario (whole loan)
GRRE	Loan splitting	Whole loan
GCRE	Loan splitting	Whole loan
IPRRE	Whole loan	Whole loan
IPCRE	Loan splitting, if hard test passed Whole loan, if hard test not passed	Whole loan

58. QIS evidence shows that (Figure 34):

[54] The hard test requirement is described in footnote 49 of the BCBS December 2017 revised standards text on exposures secured by commercial real estate.

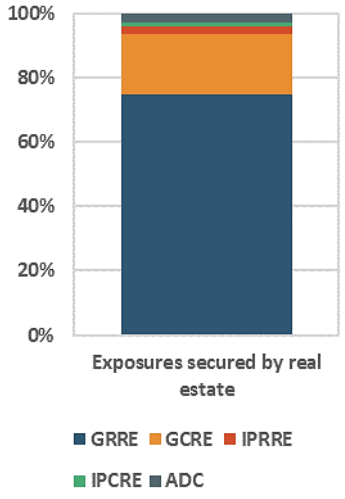
- the vast majority of the exposures secured by real estate treated under the SA are of the general type, 76.5% of them secured by residential properties and around 19% of them secured by commercial properties;

- the remaining 6.5% of real estate exposures are split among IPRRE, IPCRE and ADC, with 2.5%, 1.1% and 2.9%, respectively, of the total exposures secured by real estate.

59. Both the implementation of the Basel III central reform scenario, i.e. loan splitting, and the implementation of the whole-loan approach scenario lead to an increase in RWA for real estate exposures. In particular, the SA RWA increased by around 0.95% in the first case and 1.75% in the second case (Figure 36). In both scenarios the results are driven by the increase in RWA for GCRE (0.98% and 1.41% relative to total SA RWA for the Basel III central reform scenario and the whole-loan approach scenario, respectively). The RWA for GRRE are shown to slightly decrease in both scenarios relative to the baseline, and, although GRRE represents the bulk of exposures in the real estate exposure class, it does not manage to counterbalance the increased RWA experienced by the other three classes of real estate exposure.

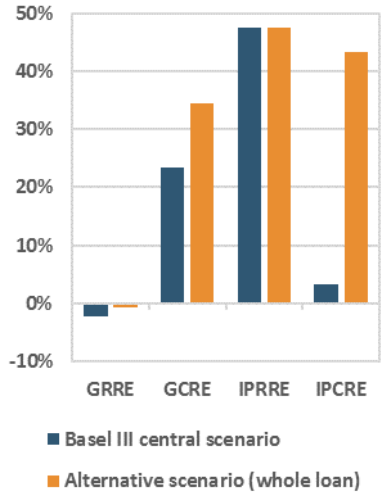
60. The change in RWA at the level of each exposure sub-class is shown in Figure 35. The highest increase in RWA affects IPRRE (47.6% of RWA of baseline IPRRE RWA), which, however, is the same in both scenarios. The whole-loan approach makes the biggest difference to IPCRE, for which the impact relative to the baseline IPCRE RWA has changed by 43.3% in the whole-loan scenario, compared with only 3.3% in the Basel III central reform scenario. It has to be kept in mind that, in this graph, the proportion of each sub-class in the overall exposures secured by real estate is not taken into account.

Figure 34 Breakdown of exposure secured by real estate by type (% of total exposures secured by real estate)



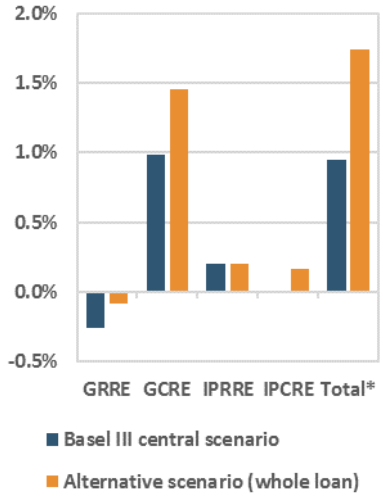
Sources: EBA 2018-Q2 QIS data and EBA calculations.
Notes: Based on a sample of 96 banks. GRRE, general residential real estate, GCRE, general commercial real estate, IPRRE, income-producing residential real estate, IPCRE, income-producing commercial real estate, and ADC, land acquisition, development and construction.

Figure 35 Percentage change in exposures secured by real estate SA RWA (relative to current sub-exposure class SA RWA)



Sources: EBA 2018-Q2 QIS data and EBA calculations.
Notes: Based on a sample of 96 banks. GRRE, general residential real estate, GCRE, general commercial real estate, IPRRE, income-producing residential real estate, IPCRE, income-producing commercial real estate, and ADC, land acquisition, development and construction.

Figure 36 Percentage change in exposures secured by real estate SA RWA (relative total current SA RWA), loan splitting versus whole loan



Sources: EBA 2018-Q2 QIS data and EBA calculations.
Notes: Based on a sample of 96 banks. GRRE, general residential real estate, GCRE, general commercial real estate, IPRRE, income-producing residential real estate, IPCRE, income-producing commercial real estate, and ADC, land acquisition, development and construction.
* Total exposures secured by real estate excluding ADC.

IPRRE – hard test

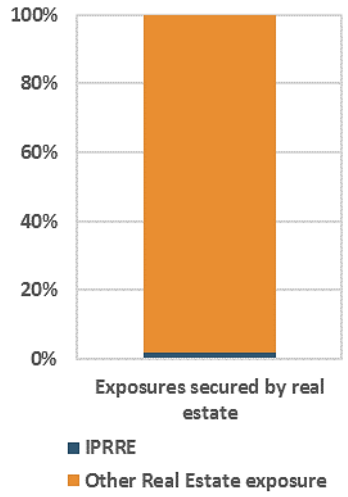
61. The hard test requirement refers to the assessment of specific conditions on the loss performance of the IPCRE at national level. If the conditions are met, the IPCRE can be risk-weighted using the loan-splitting approach, rather than the whole-loan approach. The method of assessing the hard test requirements is described in more detail in footnote 49 of the Basel III standards.

62. For IPRRE, the final Basel III framework envisages only a whole-loan approach. As requested by the Call for Advice, in this section the impact of extending the application of the hard test also to IPRRE is assessed.

63. The evidence from the QIS sample shows that the impact on the RWA is very small (Figure 38, Figure 39). This result is partly because IPRRE represents only 1.89% of the total real estate exposures (Figure 37).[55]

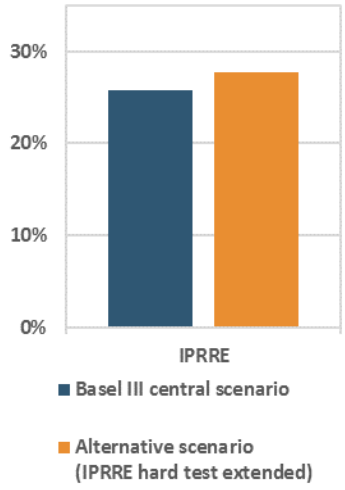
[55] This figure differes from the share of IRRE on page 87 due to different samples used for each marginal impact scenario.

Figure 37 Share of exposures secured by IPRRE (% of total exposures secured by real estate)



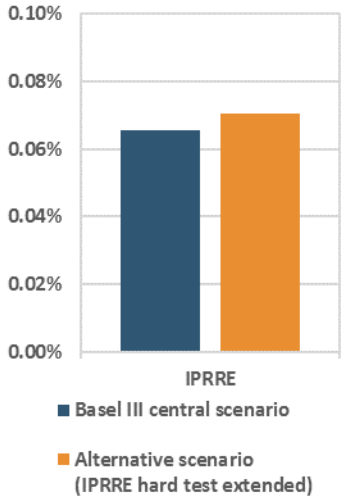
Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note Based on a sample of 148 banks.

Figure 38 Percentage change in exposures secured by IPRRE SA RWA due to application of hard test to IPRRE (relative to current IPRRE RWA)



Sources: EBA 2018-Q2 QIS data and EBA calculations.
Notes: Based on a sample of 148 banks. IPRRE, income-producing residential real estate

Figure 39 Percentage change in exposures secured by IPRRE SA RWA due to application of hard test to IPRRE (relative to total current SA RWA)



Sources: EBA 2018-Q2 QIS data and EBA calculations.
Notes: Based on a sample of 148 banks. IPRRE, income-producing residential real estate

RW multiplier to certain exposures with currency mismatch

64. The revised Basel III standards introduce a 1.5 multiplier of the applicable risk weight for unhedged retail and residential real estate exposures to individuals where the lending currency differs from the currency of the borrower's source of income. The resulting maximum risk weight is capped at 150%.

65. The QIS finds that only about 0.4% of the total SA exposure in the EU would be subject to the specific measure under consideration. Accordingly, the contribution of the currency risk multiplier to the total 8% average increase in SA RWA appears to be as low as 0.1 percentage points.

66. The exposures subject to RW multiplier are not evenly distributed across Member States. The share of exposures in foreign currency is highest for Croatia (5.8%) and Poland (5.1%), which are not in the euro area, followed by the euro area countries Spain, Austria and Italy, with 0.6%, 0.5% and 0.4% respectively.

Off-balance sheet items

67. The revised Basel III standards recalibrate the Credit Conversion Factors (CCF) of the SA framework, which are to be applied also under the F-IRB framework; under A-IRB for any off-balance-sheet items other than revolving facilities; and for the purposes of the leverage ratio exposure calculation.

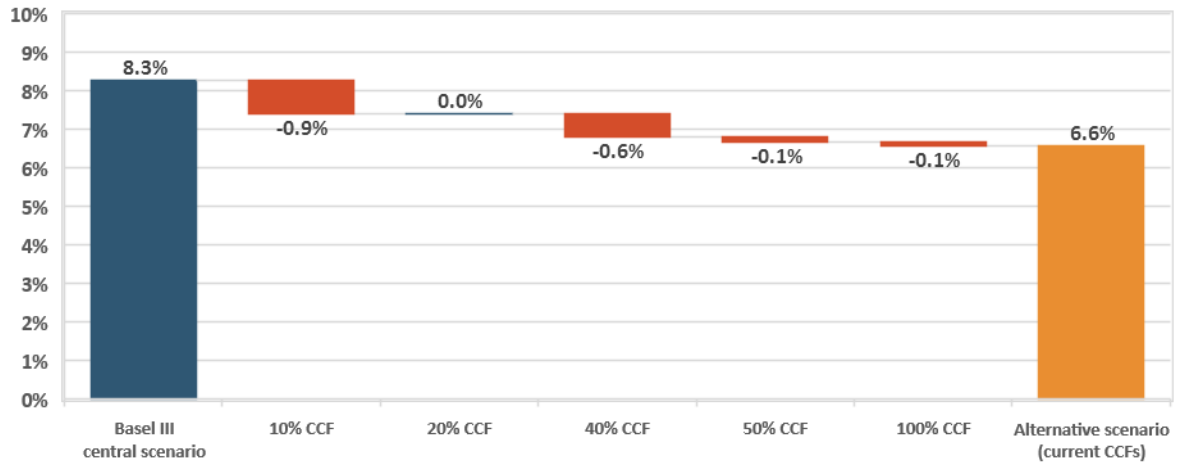
68. The most relevant changes introduced in relation to the SA treatment of off-balance sheet exposures are:

- The introduction of a 10% CCF applicable to unconditionally cancellable commitments (UCCs). UCCs are subject to a 0% CCF in the current SA framework.
- The introduction of a unique 40% CCF applicable to commitments other than UCCs. Currently, commitments other than retail UCCs are subject to a CCF of 20% (if their maturity is lower than one year) or 50% (if their maturity is one year or longer).

69. Revised CCFs account for about 1.5 percentage points in the 8% EU-average increase in SA RWA:

- the bulk of the impact stems from the newly introduced 10% CCF for all UCCs, with the remaining impact being driven by the increased CCF for short-term commitments other than UCCs;
- a negligible impact is found in relation to the use of the other categories of CCFs, which remains broadly unchanged under the revised standards.

Figure 40 Percentage change in SA RWA due to application of revised credit conversion factors (relative to total current SA RWA)



Sources: EBA 2018-Q2 QIS data and EBA calculations.
Notes: Based on a sample of 94 banks. CCF, credit conversion factor.

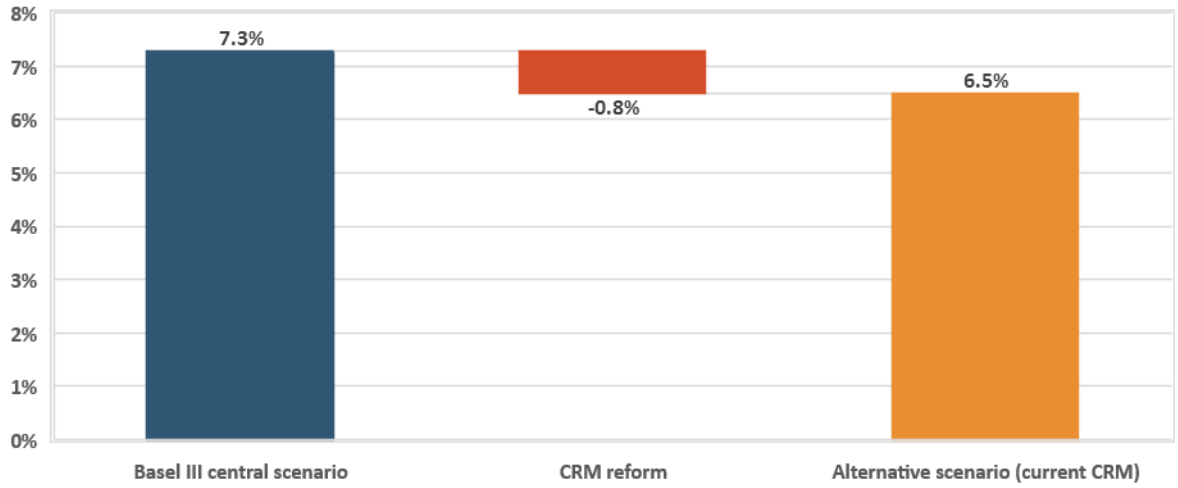
Credit risk mitigation (CRM)

70. The revised Basel III standards update the CRM framework. The changes envisaged in the new rules compared with Basel II include:

- recalibrated supervisory haircuts under the comprehensive approach to take into account the effect of collateral posted or received;
- the removal of own estimated haircuts when using the comprehensive approach to take into account the effect of collateral posted or received;
- the recognition of credit derivatives that do not cover restructuring where restructuring is not specified as a credit event;
- the removal of the use of nth-to-default credit derivatives as an eligible CRM technique.

71. The first two of the above changes have been measured quantitatively. Banks were asked to provide estimates of RWA amounts applying revised rules for SA and for CCR exposures except for the recalibrated supervisory haircuts and the removal of the use of own estimates of haircuts within the CRM framework. Based on the evidence provided by the Call for Advice sample of banks, these changes contribute 0.8 percentage points to the final 7.3% change in RWA based on the central reform scenario, compared with a similar scenario but without any changes in the CRM.

Figure 41 Percentage change in SA RWA due to the application of revised CRM reform (relative to total current SA RWA)



Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 61 banks.

72. The other two changes — the recognition of credit derivatives that do not cover restructuring where restructuring is not specified as a credit event, and the removal of the use of nth-to-default credit derivatives as an eligible CRM technique — are qualitative in nature, and are therefore more difficult

to measure quantitatively. To assess the impact of these two changes, the qualitative questionnaire is used. The individual impact of each change was also measured qualitatively and presented in the accompanying report 'Policy advice on the Basel III reforms: credit risk'.

The retail granularity criterion

73. According to the revised Basel III framework, retail exposures may be considered regulatory retail and therefore be subject to 75% risk weight when they meet, among other criteria, the granularity criterion. This criterion means that no aggregated exposure to one counterparty can exceed 0.2% of the overall regulatory retail portfolio, unless national supervisors have determined another method to ensure satisfactory diversification of the regulatory retail portfolio.

74. According to the available QIS data, the impact of removing the granularity criterion from the revised framework will be very close to 0%, i.e. no impact. Nevertheless, the EBA considers that this result is not meaningful because of data constraints.

75. Out of the 181 banks reporting SA exposure, 87 banks provided information regarding the granularity criterion. The majority of reporting banks indicated no impact as a consequence of removing the granularity criterion, which means that the RWA under the revised framework will remain the same if the granularity criterion is removed from the list of conditions for retail exposures to be considered regulatory retail exposures. Only 18 banks reported a positive impact. Due to the reduced sample, this result should be interpreted with caution.

4.1.3 Implementation issues and recommendations

IMPORTANT NOTE: This section includes only those policy recommendations on the SA framework for credit risk for which QIS data was collected, as illustrated in this report. Additional recommendations on the SA framework, and more detailed policy rationale, can be found in the EBA report 'Policy advice on the Basel III reforms: credit risk' accompanying this publication. **The numbering of the recommendations in this section is aligned with the numbering used in that accompanying report.**

ECRA versus SCRA

76. In the EU, the use of external credit ratings is a current and widespread practice for a majority of banks. While credit rating agencies may have played a prominent role in the 2008 financial crisis by underestimating the risks associated with certain products and entities, steps have been taken in the EU with regard to the set-up of regulatory and supervisory frameworks that brought clarity and transparency to the functioning of ECAIs and their methodologies for providing credit ratings.

77. Overall, the improvements brought to the methodological and regulatory sides of the ecosystem of credit rating agencies have helped building a reliable framework for the external credit risk assessment approach in Europe. Moreover, there is no European evidence of systematic deficiencies of rating methodologies for sovereigns, banks and corporates, and the adequacy of the credit ratings issued by CRAs for regulatory purposes is continuously monitored.

78. Given the extensive attention CRAs have received from regulators over the past years as well as the fact that institutions have already invested significantly in infrastructures for incorporating external credit ratings into their day-to-day practices, the EBA believes there is enough evidence, from a prudential perspective, to continue the use of the external ratings approach

Recommendation CR-SA 2: Use of the external ratings approach

The EBA recommends continued implementation of the external ratings approach, given:

- the established methodological and regulatory frameworks for the European system of CRAs;
- the lack of European evidence of systematic deficiencies of rating methodologies;
- the established process of continuous monitoring of the adequacy of the credit ratings issued by CRAs for regulatory purposes;
- institutions' significant investments in infrastructures incorporating external credit ratings.

SME supporting factor

79. The removal of the SME supporting factor is the most appropriate recommendation from a prudential perspective. This is due to a number of factors:

a) As also shown in the EBA Report on SMEs and SME supporting factor[56] published in 2016, the introduction of the SME supporting factor has not resulted in a clear and marked decrease in SMEs' probability of being credit constrained, despite this being its specific aim.

b) The same EBA report also shows that the reduced capital requirements are not necessarily reflective of the underlying credit risk of SME exposures part of different asset classes.

c) Moreover, the 85% risk weight was introduced in the SA in order to align with the treatment of SMEs under the IRB approach: there, a lower correlation with the systematic risk factor is used in the risk-weight function for exposures to SME with total annual sales between EUR 5 million and EUR 50 million.

Recommendation CR 2: SME supporting factor

The EBA considers that, due to the already more favourable treatment introduced via the final Basel III framework for CR-SA (an 85% RW for unrated corporate SMEs and a 75% RW for retail SMEs), the removal of the SME supporting factor is recommended. Instead, the final Basel III framework should be implemented without any further adjustments. The risk sensitivity of the IRB Approach already implies a differentiation of the risk weighting of the SME exposures, and any further adjustment leads to a "double counting" in the reduction of own funds requirements without any further risk-based justification.

[56] EBA report on SMEs and the SME supporting factor

Infrastructure lending supporting factor

80. Under the revised Basel III framework for the SA, specialised lending was introduced as a separate subcategory for corporates. There are three subclasses for specialised lending: object finance and commodities finance (both with a flat 100% RW for unrated exposures), and project finance (a 130% RW during the pre-operational phase and a 100% RW during the operational phase if the exposure is unrated[57]). Moreover, unrated project finance exposures in the operational phase deemed to be of high quality may receive an 80% RW.

81. At the Basel table, the high-quality category was introduced at the EU's request to enable a preferential treatment similar to the one proposed by the infrastructure lending supporting factor and based on the same arguments. The decision to top up this already preferential treatment under the revised Basel III framework with the CRR2 supporting factor could have an additional negative impact on the EU's credibility to implement international agreements into its domestic regulatory framework.

Recommendation CR 3: Infrastructure lending supporting factor

The EBA recommends that, given that the Basel III proposal for specialised lending-project finance is a similar mechanism to the CRR2 supporting factor for infrastructure lending, the final Basel III framework for specialised lending be implemented. Similarly as for the SME supporting factor, the risk sensitivity of the IRB Approach already implies a differentiation of the weighting of infrastructure lending exposures, hence no further adjustment is needed.

Equity — Impact based on the current CRR and revised Basel classification of equity exposures and phase-in implementation

82. The risk weights in general will go up for equity exposures:

    d) For the majority of equity holdings (including those holdings in other financial sector entities that are not deducted from own funds, e.g. in accordance with Article 49 of the CRR), they will increase from 100% to 250%, assuming that the holdings are held on a long-term basis. This is also consistent with the capital requirements for equity holdings that are not deducted in accordance with article 48 CRR of the CRR.

    e) For investments in private equity or venture capital firms, they will increase from 150% to 400% assuming that such holdings meet the definition of "speculative unlisted equity exposures".

    f) Regarding the implementation of the revised risk-weights, the Basel III text includes a five-year linear phase-in arrangement from the date of implementation of the Basel III standards. However, it would be advisable to prevent any undue temporary fluctuation in capital

[57] Operational phase is defined as the phase in which the entity that was specifically created to finance the project has (i) a positive net cash flow that is sufficient to cover any remaining contractual obligation, and (ii) declining long term debt

requirements, as well as to maintain consistency with the IRB approach on the implementation of the phase-in period.

Recommendation CR-SA 13: Revised risk weight treatment for subordinated debt, equity and other capital instruments

The EBA recommends the implementation of the final Basel III RW treatment for subordinated debt, equity and other capital instruments in the European regulatory framework, recognising that the overall conservative calibration of the RWs for this exposure class reflects its risk profile.

83. For equity holdings under legislated programmes, Basel II standards solely allowed at national discretion an unlimited use of the standardised approach irrespective of their materiality for an IRB bank. This discretion has been exercised by Article 150(1)(h) of the CRR. There was not, however, in addition any lower risk weight for such equity holdings under the SA than for other unrated exposures. The permanent partial use resulted, under the Basel II standards for SA, in applying the same 100% risk weight as for senior-ranking exposures to corporates, compared with 400% risk weight for non-traded equity under the IRB approach. The explicit purpose was to promote specified sectors of the economy, more precisely equity investments of US institutions in corporations or projects that are primarily designed to promote community welfare (e.g. the redevelopment of lower-income areas and services to support lower-income populations).[58]

84. In contrast to the national discretion under Basel II, exercising the new national discretion should be justified by lower risk than other equity exposures. One example, which may be relevant to consider, is that the existing legislated programmes in the US do not suggest that the risk is reduced compared with other equity exposures. Consequently, the conditions in Basel III standards appear to be not sufficiently specific to ensure a lower risk under all legislative programmes that formally meet these conditions. Should the EU exercise this discretion, this would require ensuring that the conditions for the lower risk weight under Basel III standards are met by the legislative programme in a way that does effectively reduce the loss risk to justify a 100% risk weight instead of the 250% risk weight for other equity exposures.

Recommendation CR-SA 14: Treatment of equity holdings made pursuant to NLPs

In the EBA's opinion, the RW treatment of equity holdings made pursuant to national legislated programmes should be aligned with the RW associated to other equity holdings, i.e. 250%.

85. Under current rules, any equity exposure that does not have to be deducted in the calculation of own funds of the institution is risk-weighted at 100% according to Article 133 of the CRR. The two exceptions to this rule are significant investments in financial sector entities, which are not deducted according to Article 48 of the CRR and are risk-weighted at 250%, and investments in private equity

[58] Detailed descriptions are published by the Federal Reverse System; applicable regulation is published by the Federal Reserve System (and by the OCC.

or venture capital firms, which under current rules are mandatorily risk-weighted at 150% as high-risk items.

86. While acknowledging that the revisions in the equity exposure class are the biggest driver of impact with regard to the implementation of the revised Basel III framework, from a prudential perspective it appears difficult to motivate any further preferential treatment beyond what has already been analysed.

Recommendation CR-SA 20: Additional risk sensitivity in the equity exposure class

It is the EBA's opinion that, given the high risk profile of equity and subordinated debt instruments, as well as the SA's role to ensure that a simple methodology remains available for a wide range of jurisdictions, singling out additional equity instruments for a more diversified RW treatment is not advisable under the SA for CR.

Exposures secured by real estate — whole loan versus. loan splitting approach

87. Technical arguments in favour of the whole-loan approach claim that real estate exposures are specific products with long maturities and comparably high exposure values in relation to the income of the borrower, thus requiring a specific regulatory approach. However, it should be noted that, in all other parts of the SA framework, risk weights are not adjusted for the amount and the maturity of the exposure. There could be an argument that a large loan could lead to an increase in the loss risk for a given income and assets of a borrower; however, this again depends on the individual case and can be assessed appropriately only by including explicit income - related indicators into the framework, which was not done by the BCBS when the revised SA was finalised. Moreover, for externally rated obligors the available income should already be considered for the applicable risk weight.

88. In contrast, the loan splitting approach is more risk sensitive than the whole-loan approach and therefore should be the approach implemented in the revised European regulatory framework. First, under the loan-splitting approach, collateral is always recognised only up to 55% of the property value. This means that any part of a lien or a junior lien that exceeds 55% of the property value will fully be risk-weighted as a comparable exposure to the same obligor not secured by mortgages on real estate. Because of this mechanism, loan splitting, in contrast to the whole-loan approach, is fully reflective of the higher risk that junior liens (which give access only to the remaining property value after satisfying more senior liens) pose to a lending bank. Second, by applying the counterparty risk weight to the unsecured part of the exposure, the loan-splitting approach is sensitive to the type of borrower that pledges real estate collateral to the bank, resulting in higher capital requirements for SMEs or corporates than for individuals. Finally, in the loan-splitting approach, the direct dependency of both the secured and the unsecured part on the property value after haircuts preserves the dependency of risk weights on LTV, but is nevertheless more risk sensitive than the whole-loan approach.

Recommendation CR-SA 23: Loan splitting approach vs. whole loan approach

The EBA considers that, in line with the current approach to real estate exposures, the loan splitting approach reflects the two independence criteria that "general" real estate exposures have to meet: independence of the value of the property from the credit quality of the borrower and independence of the risk of the borrower from the performance of the underlying property or project. Hence, the EBA recommends the implementation of the loan splitting approach for real estate exposures where the repayment does not materially depend on cash flows generated by the property in the revised European regulatory framework.

IPRRE — hard test

89. As under the CRR, under Basel III banks are not required to assess cash flow independence for real estate collateral located in jurisdictions where the hard test is met and thus may treat income-producing real estate collateral in the same way as general real estate. Under the Basel framework, this exemption is limited to income-producing commercial real estate, and does not include income producing residential real estate. A clear rationale for this limitation is not evident, as the arguments for and against the hard test equally apply to CRE and RRE. Therefore both types of properties should be treated consistently in the EU with regard to the hard test.

90. Footnote 46 to paragraph 67 of Basel III does permit providing further guidance setting out criteria on how material dependence on the cash flows generated by the property should be assessed for specific exposure types, which could be used for specifying this for RRE under the same hard test conditions as for CRE.

Recommendation CR-SA 24: Implementation of the hard test

The EBA considers that the use of hard test has been successful in providing an incentive for institutions to reflect real estate market deteriorations in the property values that are recognised for regulatory purposes in a timely and forward-looking manner and thus recommends maintaining its implementation to both Income Producing Commercial real estate exposures as well as Income Producing Residential real estate exposures.

RW multiplier to certain exposures with currency mismatch

91. In the qualitative questionnaire, institutions indicated the difficulty in the monitoring of the information regarding the currency of the loans due to i) monitoring requiring extensive IT costs; ii) sourcing the data being complex; iii) data being available at origination only, without monitoring conducted and iv) other reasons.

92. With regard to the scope of application of this multiplier, there are concerns that applying the instrument only to the newly originated loans would not solve the issue of borrowers exposed to the risk of FX-rate volatility, as some jurisdictions, mainly outside the Eurozone, still hold significant amounts of FX vintages with long maturities (mainly mortgage loans). Concerning non-Eurozone

jurisdictions, several episodes (e.g. CHF lending) affecting borrowers exposed to FX-rate volatility have resulted in National Competent Authorities taking measures for encouraging lending in national currency (e.g. Hungary's decision to ban FX lending), which is now on an upward trend. However, significant stocks of FX loans persist, particularly long maturity loans.

93. Since, based on the evidence provided via the qualitative questionnaire, but also based on the feedback received during the QIS, it appears difficult to track the potential currency mismatch with the borrowers' currency of income, while the materiality of FX loans in the stock of loans to households in certain jurisdictions remains significant, an extension of the scope of application of the RW multiplier to banks' full stock of FX loans should be considered. However, should banks be able to identify those exposures with currency mismatch, the RW multiplier should be applied only to those specific exposures. This measure should be considered an incentive for banks to adjust their policies with regard to monitoring.

Recommendation CR-SA 34: Risk weight multiplier for certain exposures with FX mismatch

The EBA recommends the implementation of the RW multiplier for unhedged retail and residential real estate exposures to individuals where the lending currency differs from the currency of the borrower's source of income, both currently existing loans and newly originated loans. Furthermore, where institutions are unable to single out those loans with a currency mismatch, the RW multiplier should be applied to the whole stock of unhedged retail and residential real estate exposures to individual denominated in a currency different from the national currency in the jurisdiction where the loan is originated.

Off-balance-sheet items

212. In order to better understand the challenges that the classification of off-balance-sheet items under Annex I of the CRR poses, an analysis of the Q&As that the EBA received has been carried out. The outcome of the analysis shows there are currently 19 Q&As, mostly published, related to the classification of off-balance-sheet items. All these different strands of discussion on the construction and content of Annex I illustrate the need to, at a minimum, carry out work on specifying the notions based on which items are allocated to Annex I (e.g. Basel III has a definition for the term 'commitments') and better explain what should be included in Articles 1(k), 2(b)(iv), 3(b)(ii) and 4(c) of Annex I in the CRR. It is proposed that a mandate is given to the EBA in order to clarify criteria for allocation of items to Annex I.

213. Furthermore, with regard to the newly introduced CCF of 10% for UCCs, paragraph 84 of the revised Basel text for CR SA advises that 'national supervisors should evaluate various factors in the jurisdiction, which may constrain banks' ability to cancel the commitment in practice, and consider applying a higher CCF to certain commitments as appropriate'. It is currently unclear how banks should proceed in the identification process. It is proposed to provide guidance on those factors that constrain the ability to cancel commitments in the mandate for the RTS on Annex I.

214. Finally, in Annex I of the CRR, paragraphs 2(b)(iv), 3(b)(ii) and 4(c) refer to 'other items carrying medium/medium-low/low risk' that have to be communicated to the EBA. Based on discussions regarding this notification process, it would appear that further work is needed in order to outline a process that is efficient and useful for its purposes, so it is proposed to include the notification process in the mandate for the RTS on Annex I.

Recommendation CR-SA 35: Revised treatment for off-balance sheet items

It is the EBA's opinion that the new CCFs of 10% and 40% should be introduced. However, the EBA recognises this alignment will result in a need to re-assign OBS items in Annex I of the CRR according to the new structure of the CCFs. Furthermore, the EBA considers that there is a need to further clarify the criteria for allocation of items to Annex I of the CRR, as well as provide guidance on those factors that constrain the ability to cancel commitments and also specifying the process for notifying the EBA on institutions' classification of specific OBS items in Annex I categories. Hence, the EBA is asking a mandate for an RTS be assigned in order to further specify the treatment of OBS items.

Credit risk mitigation (CRM)

In the light of the QIS results as well as the feedback from the qualitative questionnaire, the new CRM framework described in the final Basel III standards should be implemented in the EU.

Recommendation CR-SA 38: Revised CRM framework

The EBA recommends that the CRM framework be aligned with the revised Basel III provisions for CRM under the CR SA.

The retail granularity criterion

215. Recognising that the granularity criterion by itself does not ensure sufficient diversification, the proposed way forward would be to use the national discretion and develop another method to ensure satisfactory diversification of the regulatory retail portfolio, for which the EBA should get a mandate for drafting regulatory technical standards.

216. The alternative would be represented by the implementation of the "hard" granularity criterion. Based on the feedback on the qualitative questionnaire, this may likely introduce significant burden on banks to implement it and may result in a significant increase in capital requirements for the smallest banks in particular. However, a hard granularity criterion may be a necessary (although not sufficient) condition from a risk perspective, as the composition of the retail portfolio may be more aligned with the overall size of the balance sheet of an individual institution.

Recommendation CR-SA 22: Measures for ensuring diversification of the retail portfolio

It is the EBA's opinion that the proposed granularity criterion of 0.2% of the overall regulatory retail portfolio is neither necessary, nor sufficient for ensuring adequate diversification of institutions' regulatory retail portfolios. Instead, the current CRR provisions in Article 123 should be maintained in the revised European regulatory framework and further supplemented by guidance regarding appropriate diversification methods via a mandate granted to the EBA on this topic.

4.2 Revised internal ratings-based approach

217. In order to reduce undue RWA variability stemming from the use of internal models, the December 2017 agreement constrains the use of the IRB for credit risk along several dimensions and clarifies several already existing IRB standards, to reduce the variation of practices and resulting risk weights.

218. The main restrictions include:

- Removing the IRB for equity exposures, which in the revised framework can be treated exclusively under the SA.
- Removing the A-IRB for 'low default' portfolios, i.e. portfolios where the availability of historical data on default events for the purposes of LGD estimation is very limited, making the resulting LGD estimates less reliable and more volatile. The portfolios under consideration are i) large corporates (i.e. corporates with group-level consolidated annual revenues larger than EUR 500 million), ii) financial institutions treated as corporates and iii) banks.
- Increasing the values of the floors to the estimates of probability of default (PD input floors), mostly from 3 to 5 basis points across exposure classes.
- Introducing floor values for the estimates of loss given default (LGD input floors), whose values range from 25% to 50% for the unsecured part of the exposure and from 0% to 15% for the secured part of the exposure, depending on the exposure class.
- Limiting the scope of modelling of CCFs to undrawn revolving commitments (provided they are not subject to a 100% CCF under the revised SA), and imposing the use of the SA CCFs for all other types of off-balance-sheet exposures.
- Imposing floors on the estimates of the exposure at default (EAD input floors).
- Revising the values of the supervisory CCFs in the F-IRB framework aligned with the newly defined CCFs applicable in the SA framework.

219. Among several other changes implemented to the IRB, other revisions assessed from a quantitative perspective in this report include:

- The revision of the LGD supervisory values applicable under the F-IRB, whereby the LGD parameter applicable to senior unsecured corporate exposures is lowered from 45% to 40% and LGD parameters applicable to secured and partially secured exposures are also generally lowered across exposure classes.

- The clarification on the calculation of the effective maturity of revolving exposures, which in the revised framework must be equal to the maximum contractual maturity of the facility and not the repayment date of the current draw.

- The requirement to use the F-IRB or SA on guaranteed exposures whenever a direct exposure to the guarantor would have to be treated under, respectively, the F-IRB or SA.

- The removal of the 1.06 IRB scaling factor currently applicable to the vast majority of IRB risk weights. This factor, introduced in the Basel II framework in order to impose a margin of conservatism in the use of internal models, becomes unnecessary in the light of the multiple constraints that the finalised Basel III framework introduces in the area of internal models.

220. Finally, the December 2017 reform introduces an aggregate output floor to the bank's total RWA, based on 72.5% of the standardised approach RWA. The floor is a top-down measure that materially affects all modellable RWA — with credit risk being in most if not all cases the largest category of modellable RWA. Given the aggregate (i.e. balance-sheet-wide) nature of the floor, its impact and implementation features are discussed in a standalone chapter (Chapter 10) of this report.

4.2.1 Impact of the overall reform

221. The revised standards on the use of the IRB have different impacts on different portfolios and regulatory approaches. By and large, the revised framework will result in increasing risk-weighted assets for all exposures currently treated under the A-IRB, with the exception of sovereign exposures and exposures to residential mortgages, and decreasing RWA for all exposures currently treated under the F-IRB with the exception of exposures to banks (Figure 42).

222. The impact for those regulatory portfolios that remain eligible for the A-IRB in the revised framework is predominantly driven by the introduction of the new LGD input floors. Among these, the specialised lending portfolio (excluding the slotting[59] component) experiences a 30% increase in RWA and is among the most affected portfolios of the IRB framework. For the three low default portfolios in relation to which the reform bans LGD modelling (the so-called migration to the F-IRB), the most important drivers of impact are, in this order, the migration to the F-IRB and the newly set PD input floors. Exposures to banks and to financial institutions treated as corporates are among the most

[59] Specialised lending exposures treated under the slotting approach are not subject to PD and LGD estimation and, given this, are hardly affected by any of the IRB revisions included in the package of reforms under consideration.

affected regulatory portfolios of the IRB framework, experiencing increases in RWA of, respectively, 80% and 30% from current levels. The impact of the migration is less material for exposures to large corporates, as in the same context the regulatory LGD applicable to both secured and unsecured corporate exposures in the F-IRB framework is lowered.

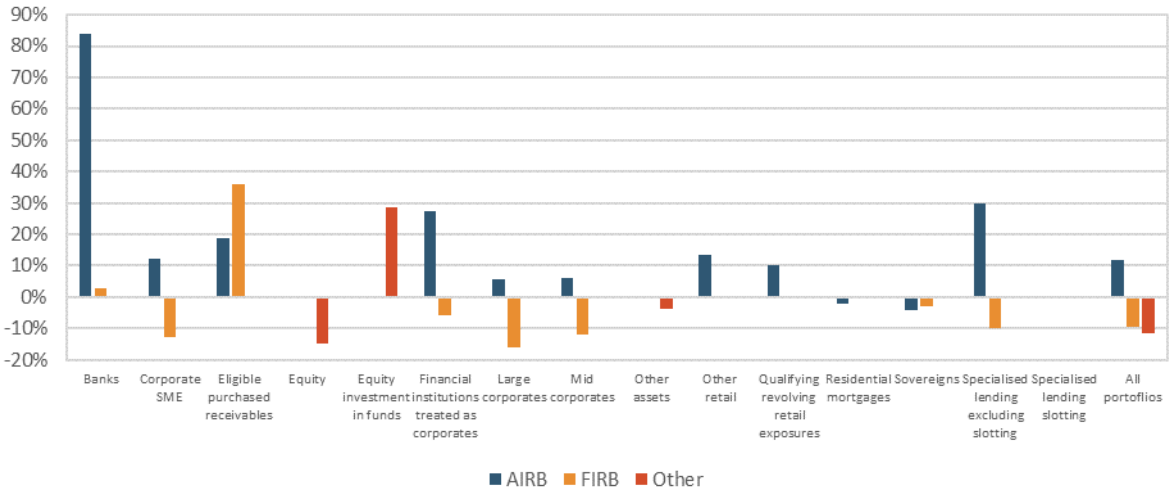
223. Data quality is such that the material increase in RWA (18%) found for the eligible purchased receivables exposure class should be interpreted with caution.

224. The generalised decrease in RWA for exposures classes currently treated under the F-IRB reflects, among other factors, the introduction of lower revised F-IRB LGD parameters.

225. Exposures to equity investment in funds are also subject to a material increase in RWA (above 25%), as the most widely used approaches for these exposures in the current IRB framework (called look-through approach and mandate-based approach) are based on the IRB risk weights that apply to the assets in which the equity funds invest. Given this, this exposure class reflects the overall increase in IRB RWA across exposure classes. In addition, the Basel III framework imposes a 1 250% risk weight treatment in all those cases where information on the fund's underlying assets is not available, whereas in the EU framework a lower risk weighting applies

226. With the removal of the IRB for exposures to equity (the so-called migration to the SA), RWA for this exposure class are expected to decrease (-15%). Whereas 370% is the prevailing risk weight for these exposures under the current so-called simple risk weight approach, most of them are expected to be risk-weighted at 250% under the revised SA framework for equity, hence the result of RWA relief.

Figure 42 Percentage change in IRB RWA for each exposure class and IRB approach (relative to current exposure class and IRB approach RWA)



Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 78 banks.

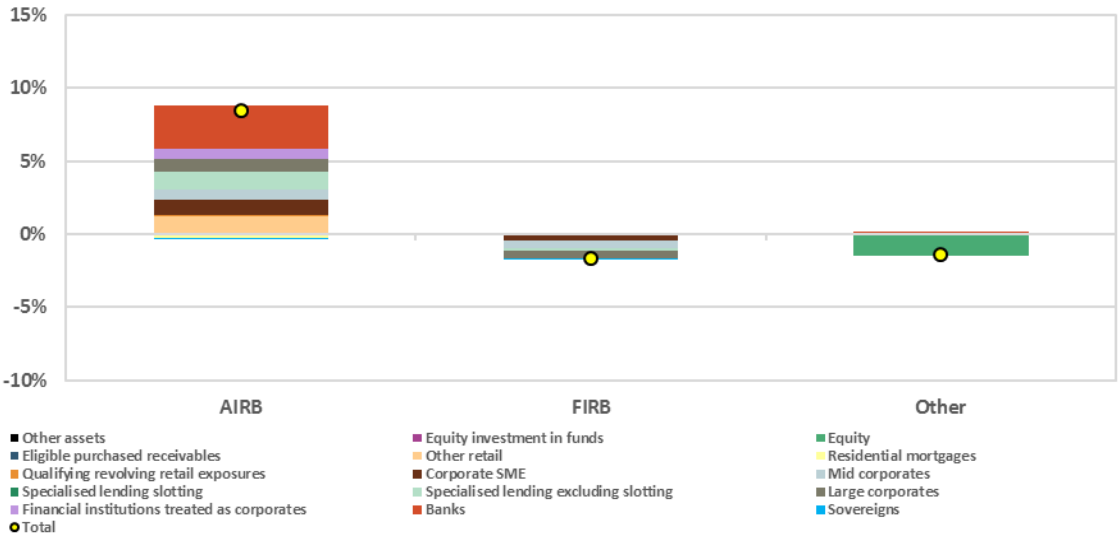
227. The average increase in IRB RWA across the EU is approximately 5%.

228. The increase in IRB RWA is driven by a medium increase of RWA (8.5%) for exposures currently treated under the A-IRB, a slight decrease of RWA (-1.6%) for those currently treated under the F-IRB and a decrease in RWA for equity exposures (Figure 44).

Figure 43 Percentage change in IRB RWA (relative to total current IRB RWA), by size and exposure class

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 78 banks: Large (65), of which G-SII (8), of which O-SII (40); Medium (13).

Figure 44 Percentage change in IRB RWA (relative to total current IRB RWA), by IRB regulatory approach and exposure class



Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 78 banks.

229. Considering the majority of the institutions in the sample (around 90%), insitutions show IRB RWA changes from a decrease of -13% to an increase of 26% (Table 37). The impact is quite evenly

distributed within this range. However, the average impact is further driven by one outlier showing a very high increase in IRB RWA.[60]

Table 37 Distribution of percentage change in IRB RWA (relative to total current IRB RWA), all banks

Percentile	Percentage
5th percentile	-13.4
25th percentile	-4.7
Median	0.0
75th percentile	10.1
95th percentile	26.0

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 78 banks.

230. In terms of contribution of the various IRB exposure classes, the average impact is mostly driven by increasing RWA associated with current A-IRB exposures to banks, other retail and specialised lending exposures, and to a lesser extent exposures to corporate SMEs, large corporates and financial institutions treated as corporates.

231. The widespread use of A-IRB models in the current EU framework drives the average result (see Table 131 and

[60] The outlier shows an impact of over 1 200% and has been confirmed by the relevant national competent authority.

232. Table **132** in annex 3). In particular:

- the relative use of A-IRB/F-IRB within each exposure class is never below 60%/40% in the current EU framework;
- the relative use of the A-IRB is 80% or higher for large corporates, financial institutions treated as corporates and corporate SMEs;
- G-SIIs are those that most rely on A-IRB models across most exposure classes.

233. The average IRB impact is lower for O-SIIs, partly because these institutions predominantly use the F-IRB for exposures to banks, financial corporates and specialised lending (Figure 44).

234. In the case of medium-sized institutions:

- the use of the A-IRB is 100% for large corporates and 90% for medium-sized corporates, which account for a significant proportion of the total IRB RWA increase for this type of institutions;
- the use of F-IRB models dominates exposures to banks and financial institutions treated as corporates, which also explains the relatively low importance of these portfolios in the average IRB impact.

235. Due to the definition of 'small and non-complex' institutions used in this report, whereby an institution is considered small and non-complex if it does not use any internal model for regulatory capital purposes in the revised framework, the sample of IRB institutions does not include any small institutions.

236. Exposures to banks are an important driver of impact for the cross-border universal business model (Figure 45), which mostly uses A-IRB models for this type of exposures in the current framework. The restriction of LGD modelling on exposures to banks is also a very material driver of impact for public development banks, as this business model is heavily exposed to private partner institutions with which public support programmes are implemented (not shown here because there are fewer than three entities in the cluster).

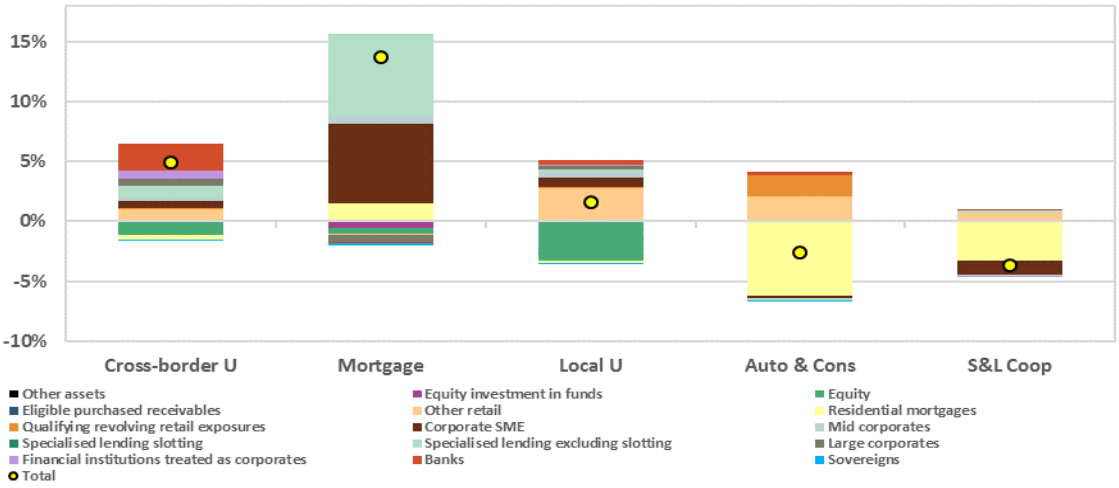
237. The mortgage business model's increase in IRB RWA is mostly driven by the A-IRB reforms affecting the corporate SME portfolio, which is the second largest portfolio (after the mortgage portfolio) in the balance sheet of IRB mortgage banks and is almost entirely treated under the A-IRB in the current framework. RWA for this portfolio also increase due to the removal of the CRR SME supporting factor within the central reform scenario. The increase in specialised lending (excluding slotting) RWA is particularly material for one institution of the mortgage bank business model.

238. The other retail exposure class drives the IRB impact for the local universal, automotive and consumer credit, and building society (not shown because fewer than three units in the cluster) business

models, due to the reforms affecting A-IRB models and the removal of the CRR SME supporting factor within the central reform scenario.

239. Overall, IRB RWA decrease for savings and loan associations and cooperative banks due to decreasing requirements on their mortgage portfolio. The same average result for the automotive and consumer credit business model is driven by one institution.

Figure 45 RWA increase per exposure class (relative to total current IRB RWA), by business model



Sources: EBA 2018-Q2 QIS data and EBA calculations.
Notes: Based on a sample of 87 banks: Cross-border U (37), Public Dev* (1), Mortgage (5), Other special* (2), Local U (27), Auto & Cons (3), Building Soc* (2), S&L Coop* (8), Private* (1), Merchant* (1).
* Not shown in the chart because fewer than three entities in the cluster.

240. Different jurisdictions experience different impacts of the revised IRB framework (Figure 46):

- Corporate SMEs drive the impact in Denmark and Ireland, albeit in opposite directions. Such exposures are currently subject to the A-IRB in the former jurisdiction and the F-IRB in the latter. The impact on corporate SMEs is also material in several other jurisdictions, where increases and decreases in RWA tend to correspond with the current prevailing use of, respectively, the A-IRB and F-IRB frameworks.

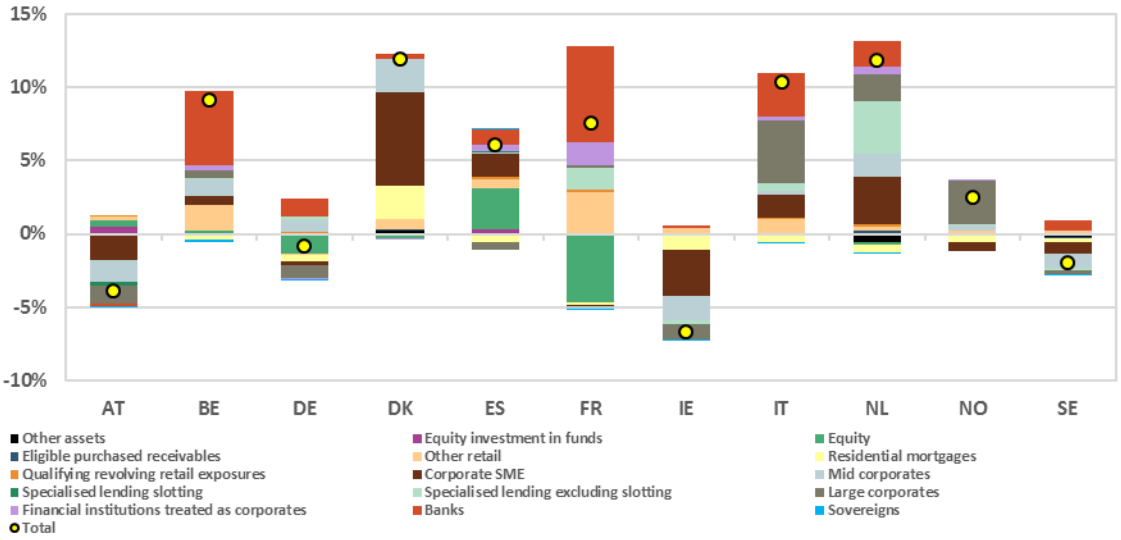
- **Figure 46**.

- Exposures to banks are the main driver of impact in Belgium, France, Germany and Luxembourg (not shown because fewer than three units in the cluster), but are also a significant driver in other jurisdictions. Belgium is the EU Member State where exposure to banks covers the highest proportion of total IRB exposures. Whereas Belgium and France currently model the vast majority of exposures to banks under the A-IRB, Luxembourg and Germany mostly use the F-IRB.

- Exposures to large corporates are a major driver of impact in Italy and Norway, where these exposures are almost entirely subject to the A-IRB in the current framework and will therefore bear the cost of restricting LGD modelling.

- Corporate SMEs drive the impact in Denmark and Ireland, albeit in opposite directions. Such exposures are currently subject to the A-IRB in the former jurisdiction and the F-IRB in the latter. The impact on corporate SMEs is also material in several other jurisdictions, where increases and decreases in RWA tend to correspond with the current prevailing use of, respectively, the A-IRB and F-IRB frameworks.

Figure 46 RWA increase per exposure class, by country (relative total current IRB RWA)



Sources: EBA 2018-Q2 QIS data and EBA calculations.
Notes: Based on a sample of 87 banks: AT (3), BE (6), DE (17), DK (6), ES (5), FI* (2), FR (7), GR* (1), IE (6), IT (8), LU* (2), LV* (2), NL (5), NO (5), PL* (1), PT* (2), SE (9).
* Not shown in the chart because fewer than three entities in the cluster.

241. Table 106 to Table 113 in Annex 2 decompose the IRB impact at exposure class level into the contributions made by each sub-exposure class.

4.2.2 Individual reforms and scenario analysis

IMPORTANT NOTE: This section aims to shed light on the sensitivity of the impact to individual policy revisions of the IRB framework for credit risk. It does so by comparing — in terms of impact on IRB RWA — a scenario of full implementation of the Basel III reform (Basel III central scenario) with alternative scenarios in which each individual revision under consideration is not implemented or is calibrated differently (Basel III excluding specific revision). The analysis is based on samples of varying size, depending on the IRB revision under consideration, to maximise the informative value of the QIS. For this reason, the figures on the impact of the Basel III central scenario in this section are not comparable with the impact figures for the same scenario presented in section 4.2.1. Section 4.2.1 should be considered the reference when it comes to assessing the level impact of the central reform scenario on IRB RWA.

In addition, unless stated otherwise, the analysis of the marginal impact of individual IRB revisions carried out in this section focuses on IRB RWA and does not measure how a given

change in IRB RWA may affect the output floor calculation and hence the overall impact of the reform.

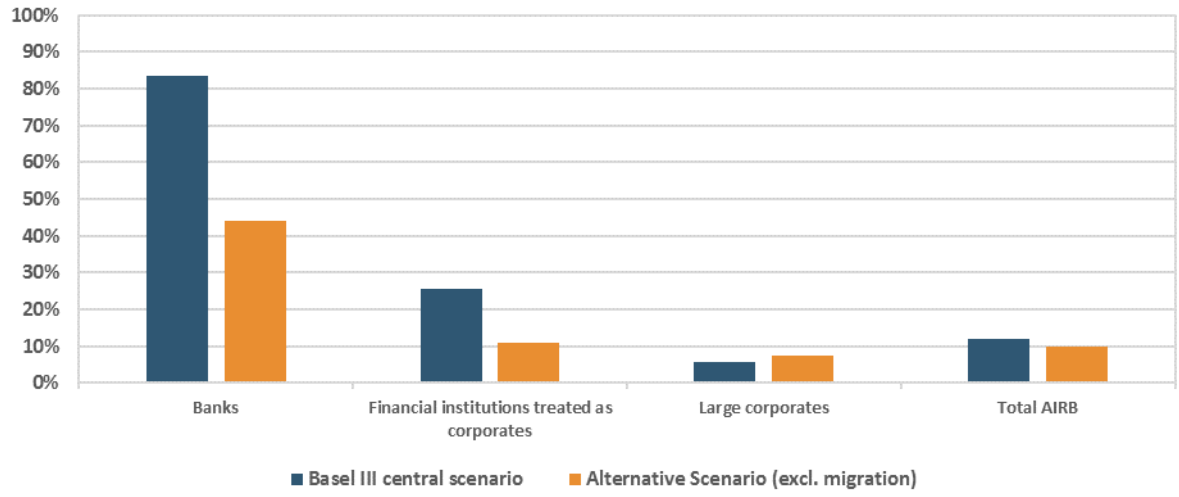
Reduction in the scope of the A-IRB (migration of exposures to the F-IRB)

242. The IRB reform restricts the scope of the A-IRB in relation to the three 'low default portfolios', i.e. portfolios typically characterised by low number of obligors and low default rates and hence scarcity of default data for parameter estimation. The restriction of LGD modelling has its highest impact on exposures to banks and exposures to financial institutions treated as corporates. QIS evidence (Figure 47) shows that, if institutions were allowed to keep using A-IRB models for such portfolios in the revised framework, the impact of the reform on these portfolios would approximately halve.

243. Conversely, on exposures to large corporates the restriction of LGD modelling leads to a slight relief in the requirement. This result seems to indicate that, on average, institutions' LGD estimates would be more conservative than the newly set supervisory LGD parameters, in particular taking into account that the revised F-IRB framework lowers the LGD parameter applicable to both secured and unsecured corporate exposures from 45% to 40%.

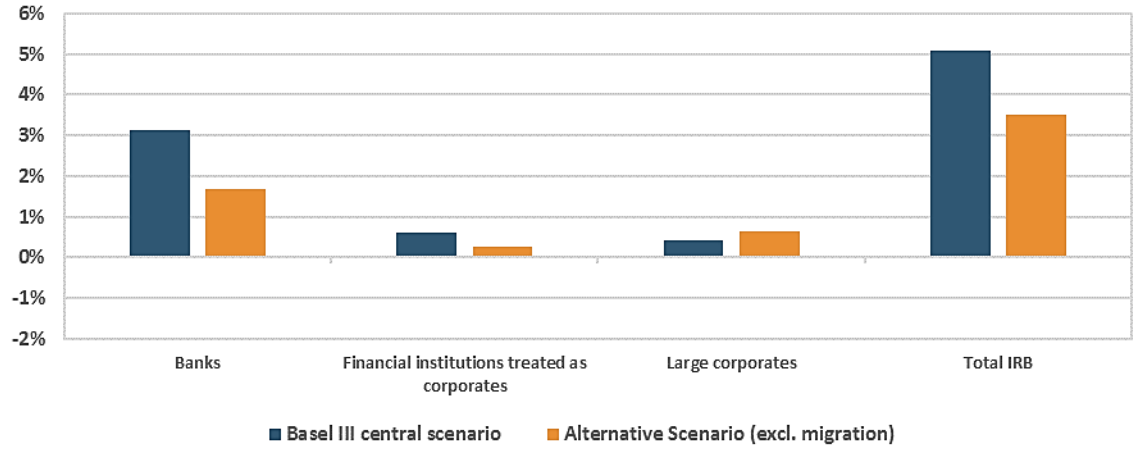
244. Overall, around 30% of the total increase in IRB RWA is found to stem from the reduction in scope of the A-IRB on the three low default portfolios (Figure 48).

Figure 47 Percentage change in AIRB RWA per exposure class migrating to FIRB approach (relative to exposure class current AIRB RWA)



Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 48 banks.

Figure 48 Percentage change in IRB RWA per exposure class excluding migration to FIRB approach (relative to total current IRB RWA)



Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 48 banks.

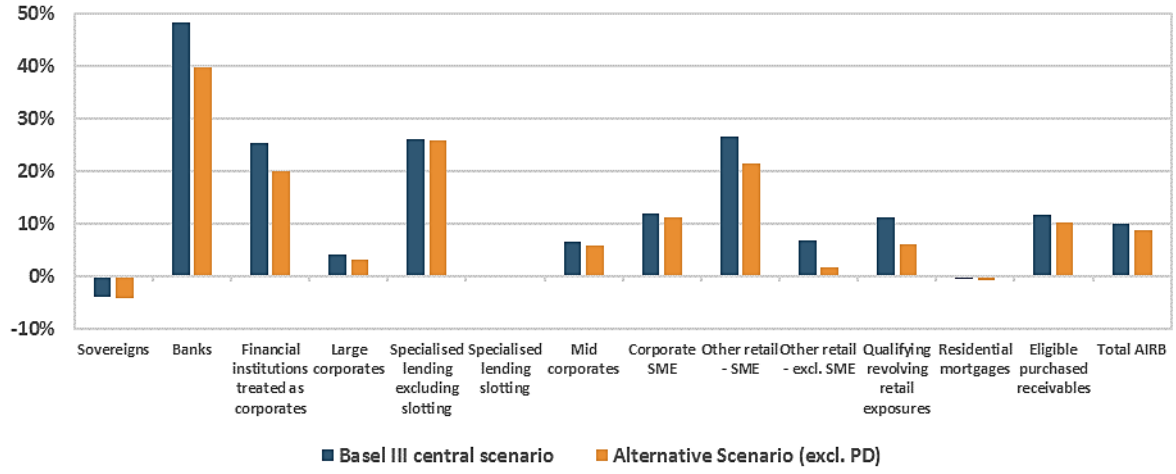
PD Input floors

245. As could be expected, the increase in PD input floors is found to have a sizeable impact on current A-IRB exposures to banks and exposures to financial institutions treated as corporates, migrating to the F-IRB. Input floors act as a backstop to particularly low PD estimates, which are subject to high uncertainty due to the scarcity of default evidence. Input floors are found to account for around 20% of the RWA increase at portfolio level for both portfolios under consideration (Figure 51).

246. Input floors are also a material driver of impact for the A-IRB qualifying revolving portfolio, where they account for around 50% of the increase in portfolio RWA (Figure 49). In this portfolio, the PD floor increases to 0.1% for exposures other than the newly defined category of transactors. As only a few banks in the sample reported non-negligible amounts for transactors, the average result of the qualifying revolving portfolio is driven by exposures other than transactors.

247. In relation to large corporates currently treated under the A-IRB, which is also classified as a low default portfolio, PD input floors are found to have a less material impact, highlighting that, on average, PD estimates for corporates are closer to the newly set 5 basis points PD floor value. For all other portfolios currently treated under the A-IRB, the marginal impact of PD input floors is found to be less material (Figure 49).

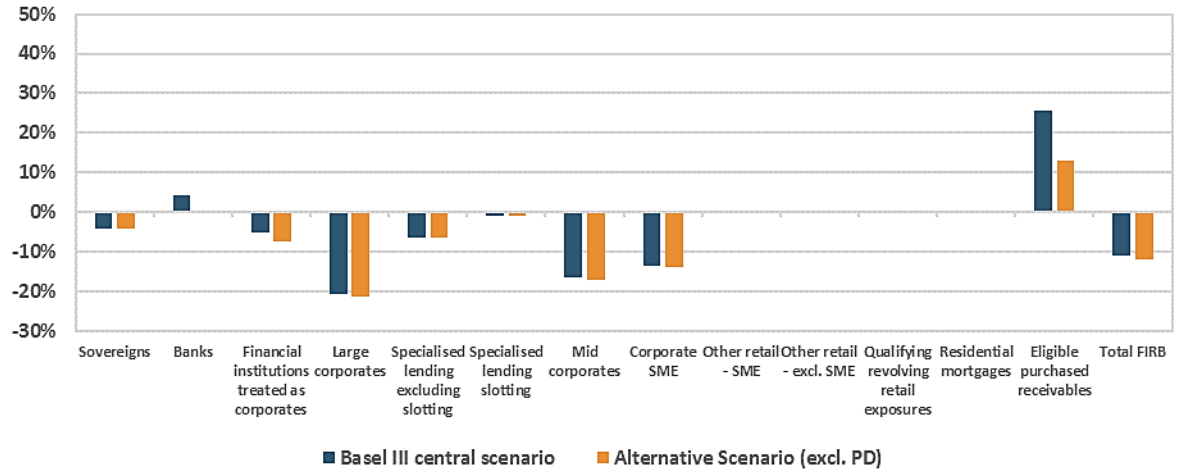
Figure 49 Percentage change in AIRB RWA per exposure class excluding PD input floor (relative to exposure class current AIRB RWA)



Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a a sample of 48 banks.

248. Also in the case of portfolios currently treated under the F-IRB, PD input floors appear to be significant drivers of impact for exposures to banks and financial institutions treated as corporates. In the case of exposures to banks, the new PD floors account for the whole RWA increase resulting from the reform: should the new floors not be implemented, the portfolio under consideration would experience a decrease, rather than an increase, in RWA (Figure 50). Eligible purchased receivables currently treated under the F-IRB are also found to be materially affected by the new PD input floors, under which they account for around half of the portfolio RWA increase triggered by the overall reform.[61]

Figure 50 Percentage change in FIRB RWA per exposure class excluding PD input floor (relative to exposure class current FIRB RWA)

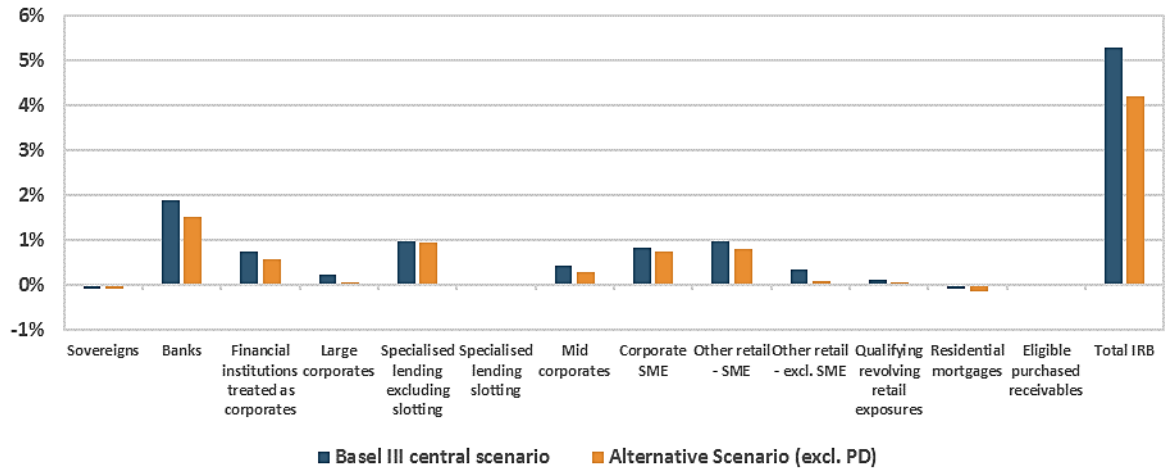


[61] Impact results regarding purchased receivables should be interpreted with caution, due to data quality.

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Notes: Based on a sample of 48 banks. The F-IRB approach is not available for qualifying revolving retail, residential mortgages and other retail, hence the absence of bars in the chart

249. Overall, around 20% of the total increase in IRB RWA is accounted for by the revised PD input floors (Figure 51).

Figure 51 Percentage change in IRB RWA per exposure class excluding PD input floor (relative to total current IRB RWA)



Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 48 banks.

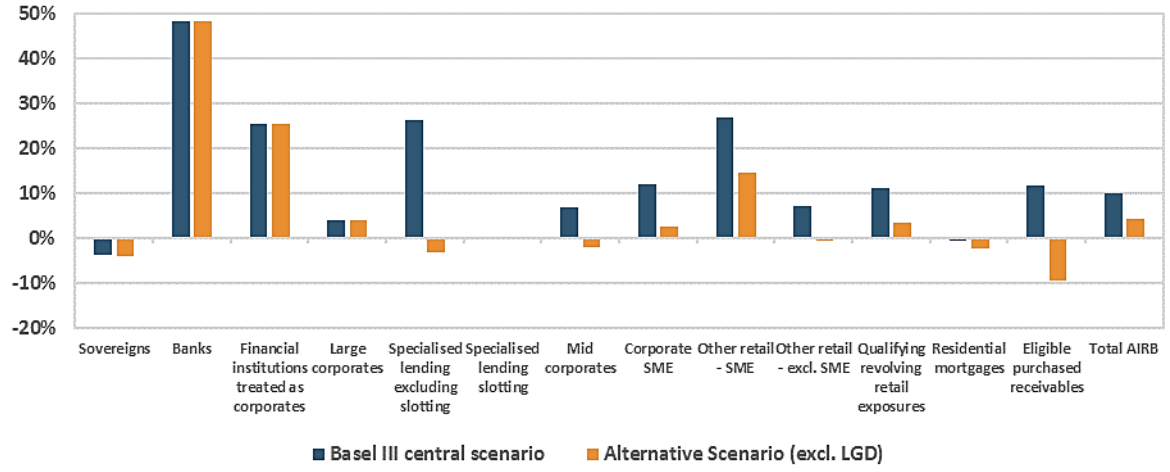
LGD Input floors

250. As could be expected given the structure of the IRB risk weight formulae, the newly set LGD input floors play a very material role in explaining the impact of the reform on exposures treated under the A-IRB (Figure 52). For all exposure classes that remain under the A-IRB in the revised framework, LGD input floors are the main drivers of impact. When excluding the new LGD floors from the calculation of the RWA, the impact of the IRB reform is materially dampened for certain exposure classes and becomes negative for some others, with the removal of the currently existing IRB 1.06 scaling factor prevailing as revision that determines RWA relief across the IRB framework.[62]

251. Overall, the LGD input floors appear to account for around 80% of the increase in IRB RWA in the sample (Figure 53).

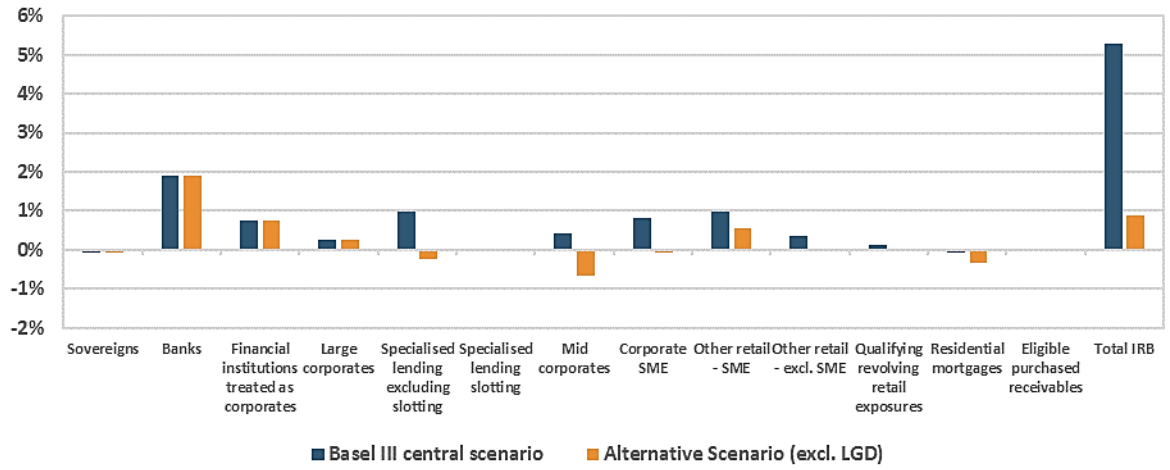
[62] Impact results regarding purchased receivables should be interpreted with caution due to data quality.

Figure 52 Percentage change in AIRB RWA per exposure class excluding LGD input floor (relative to exposure class current AIRB RWA)



Sources: EBA 2018-Q2 QIS data and EBA calculations.
Notes: Based on a sample of 48 banks. Current A-IRB exposures to banks, financial institutions treated as corporates and large corporates are subject to the F-IRB approach under the revised framework; hence, no difference in impact arises for these portfolios due to LGD input floors. Specialised lending exposures under slotting are not subject to PD/LGD parameters.

Figure 53 Percentage change in IRB RWA per exposure class excluding LGD input floor (relative to total current IRB RWA)



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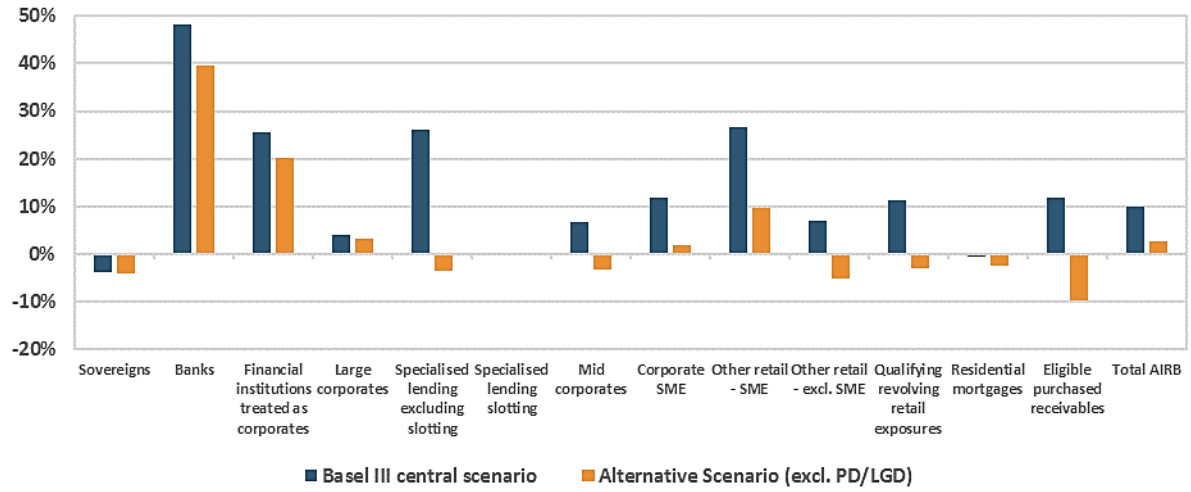
Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 48 banks.

PD and LGD Input floors (joint implementation)

252. The new PD and LGD input floors, considered jointly, are the drivers of RWA increase for exposures currently treated under the A-IRB approach. Excluding these revisions from the implementation of the reform package would almost fully offset the RWA impact of the reform on these exposures, leaving the restriction of LGD modelling on banks, financial institutions and large corporate portfolios as the main residual driver of impact (Figure 54).

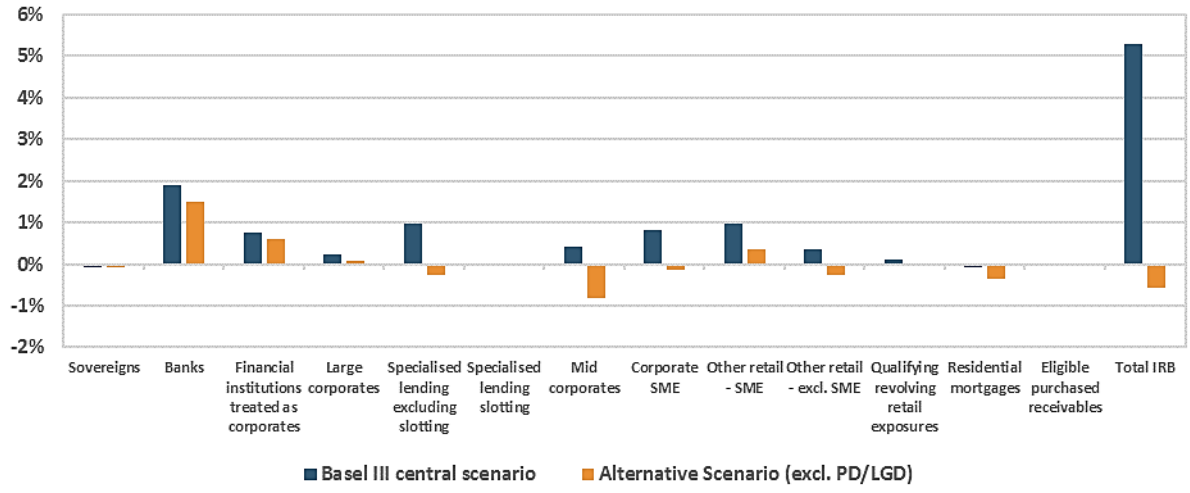
253. Overall, the joint implementation of the revised PD and LGD input floors accounts for the whole increase in IRB RWA in the sample. In the absence of these revisions, IRB RWA would decrease as a result of the reform, due to the revisions of LGD parameters applicable in the F-IRB framework as well as the removal of the IRB 1.06 scaling factor, among other reasons (Figure 55).

Figure 54 Percentage change in AIRB RWA per exposure class excluding PD & LGD input floors (relative to exposure class current AIRB RWA)



Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 48 banks.

Figure 55 Percentage change in IRB RWA per exposure class excluding PD & LGD input floors (relative to total current IRB RWA)

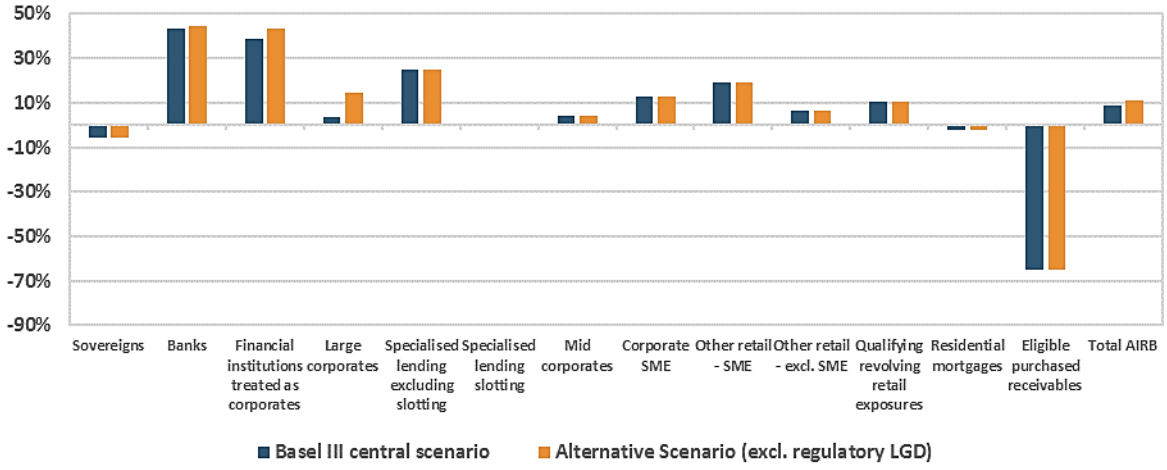


Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 48 banks.

Regulatory LGD (F-IRB)

254. The revised framework lowers LGD supervisory values applicable to senior unsecured corporate exposures (from 45% to 40%) as well as to secured and partially secured exposures. Among the exposures currently treated under the A-IRB, exposures to banks, large corporates and financial institutions treated as corporates will be subject to the F-IRB in the revised framework. For exposures to banks and financial institutions, the revision of the LGD parameters is not a major driver of impact Figure 56). The downward revision of the LGD parameter for corporate exposures acts as a main mitigant of impact for those large corporate exposures that migrate to the F-IRB framework. The impact study shows that without that downward revision the RWA impact for those exposures would be almost four times as high.

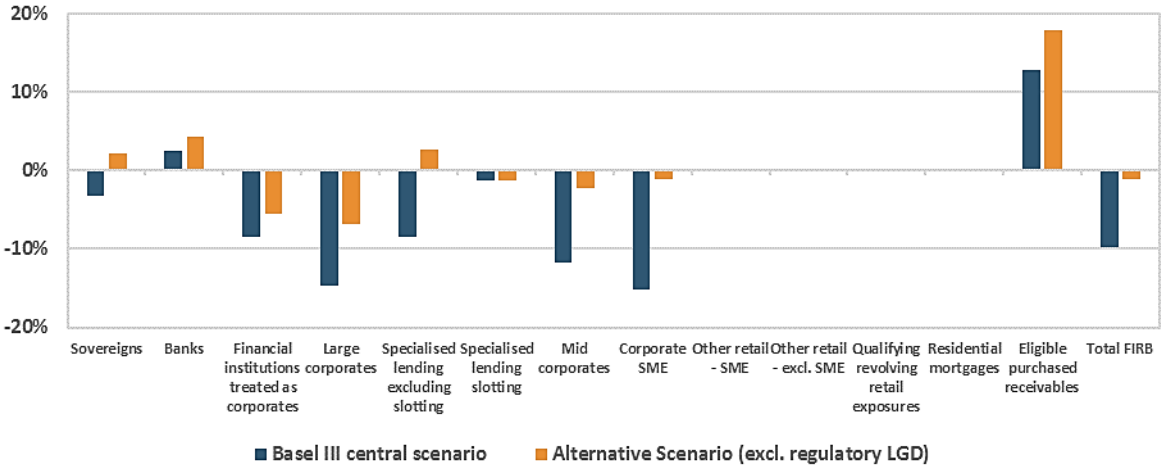
Figure 56 Percentage change in AIRB RWA per exposure class excluding regulatory LGD (relative to exposure class current AIRB RWA)



Sources: EBA 2018-Q2 QIS data and EBA calculations.
Notes: Based on a sample of 51 banks. Only exposures to banks, financial institutions treated as corporates and large corporates currently treated under the A-IRB will be subject to supervisory LGD in the revised framework, due to the restriction of LGD modelling. All other exposure classes in the chart remain under the A-IRB in the revised framework and hence are not affected by the revision of LGD supervisory values.

255. The downward revision of supervisory LGD values is a major driver of the RWA relief measured in relation to exposure classes treated under the F-IRB. Should these LGD revisions be excluded from the implementation of the revised framework, the impact of the reform for F-IRB exposures would be close to no change, instead of a relief in the requirement (Figure 57).

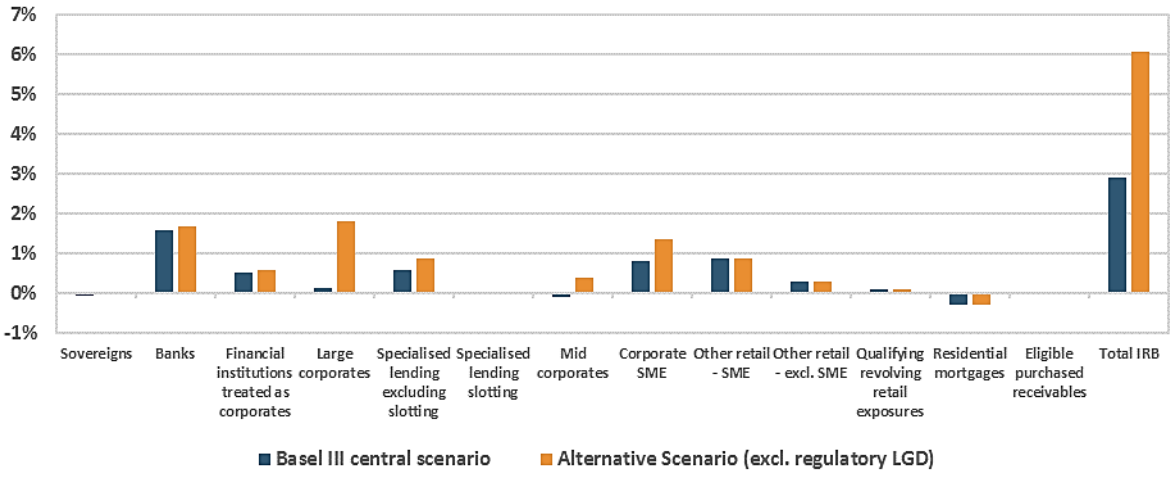
Figure 57 Percentage change in FIRB RWA per exposure class excluding regulatory LGD (relative to exposure class current FIRB RWA)



Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 51 banks.

256. Overall, the increase in total IRB RWA would approximately double if the downward revision of supervisory LGD parameters were not implemented (Figure 58).

Figure 58 Percentage change in IRB RWA per exposure class excluding LGD regulatory values (relative to total current IRB RWA)



Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 51 banks.

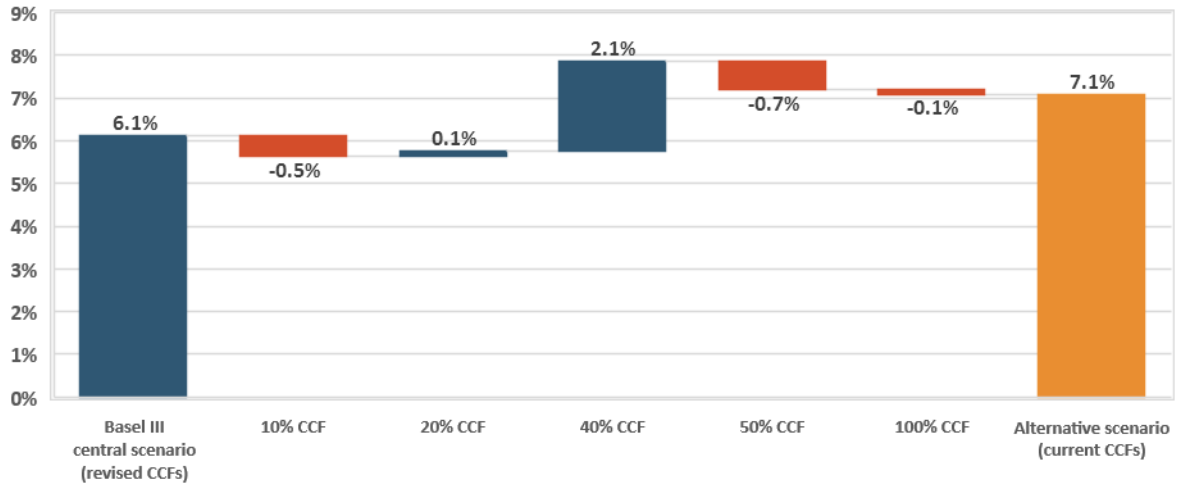
CCFs

257. The IRB reform recalibrates the CCFs applicable in the F-IRB framework on the basis of the newly defined SA CCFs. In addition, it provides that the scope of modelling of CCFs in the A-IRB framework is limited to undrawn revolving exposures, mandating that the F-IRB CCFs are to be applied to all

other exposure classes of the A-IRB framework. Finally, the reform sets new input floors to the estimation of exposure at default (EAD).

258. Overall, the reform of the CCFs leads to a relief in IRB RWA, i.e. if the CCF revisions were not implemented the impact of the reform on IRB RWA would be approximately 15% higher (Figure 59). Most of this impact stems from the recalibration of the F-IRB CCF parameters, with the reduction in the scope of modelling and the input floors playing a minor role.

Figure 59 Percentage change in IRB RWA due to application of revised credit conversion factors (relative to total current IRB RWA)



Sources: EBA 2018-Q2 QIS data and EBA calculations.
Notes: Based on a sample of 43 banks. CCF, credit conversion factor.

Clarification on the effective maturity of revolving exposures

259. The revised framework clarifies that the effective maturity of revolving exposures must correspond to the maximum contractual maturity of the facility and not the repayment date of the current draw. QIS evidence is that implementing such clarification is likely to have an immaterial impact on IRB RWA. The result should, however, be interpreted with some caution, as it may also be driven by institutions' difficulties in implementing the specific revision for QIS purposes.

Treatment of guaranteed exposures

260. The revised framework provides that guaranteed exposures should be treated under the F-IRB or SA whenever a direct exposure to the guarantor would have to be treated under, respectively, the F-IRB or SA. The quality of data related to the impact assessment of this revision raises several concerns, as a very limited number of institutions reported figures covering this aspect. For this reason the impact results on the revisions of the guarantees framework are not deemed reliable and nothing robust can be said on the impact of the reform in this area.

SME supporting factor

261. The CRR applies a supporting factor to eligible exposures to SMEs, under both the SA and IRB frameworks. Such capital treatment is included in the baseline scenario considered in this report, as it is part of the current national implementation of the Basel III standards (Table 29). The supporting factor is not part of the Basel III standards and hence is not included in the central reform scenario.

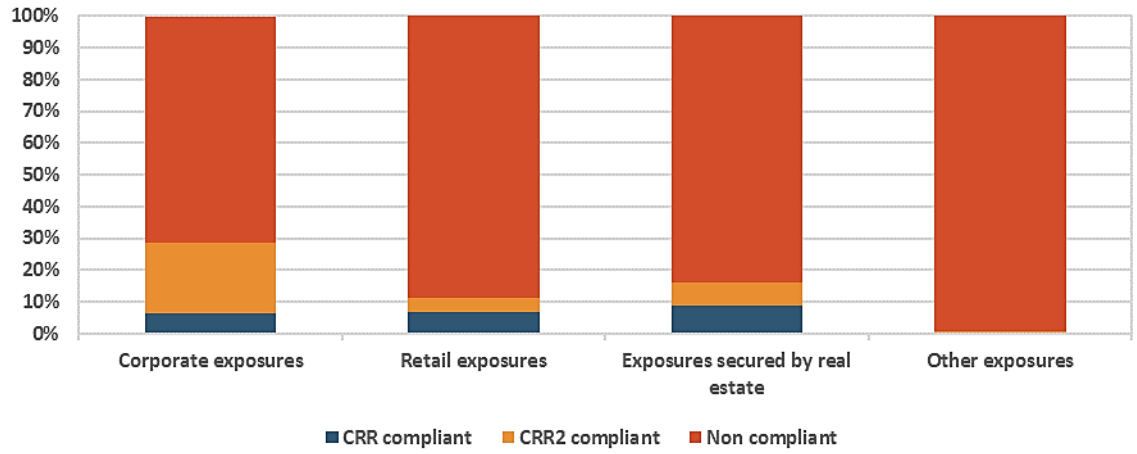
262. The new CRR2 regulation will change the existing rules on the SME supporting factor, widening its scope of application and modifying its calibration. The proposed changes, according to which a 23.8% reduction in terms of capital requirements would apply to up to EUR 1.5 million of loans granted to SMEs, are not included in either the baseline or the central reform scenario of the impact analysis included in this report. Instead, two alternative scenarios — alternative baseline and alternative central reform scenario — were designed to take into account the modified SME supporting factor.[63]

263. Similarly to the section on the standardised approach, this section of the report looks at the impact of the alternative baseline and reform scenarios concerning the implementation of preferential treatments for exposures to SMEs in the IRB framework.

264. Table 30 lists all the scenarios considered and provides the description of each scenario. The first comparison is between the Basel III central scenario (scenario C in Table 30) and an implementation of the Basel III standards that also includes the CRR2 rules on the SME supporting factor (scenario D in Table 30). Both scenarios are assessed against a consistent baseline scenario, which includes the currently applicable CRR rules on the SME supporting factor (scenario A in Table 30).

265. It should be noted that around 15% of the exposures to SMEs in the corporate and retail portfolios appear to be eligible for the CRR2 SME supporting factor. The application of such supporting factor would substantially mitigate the impact of the IRB reform of the exposure classes under consideration.

Figure 60 Compliant exposures to SMEs (% of total exposure in exposure class)



[63] The estimates presented here are likely to underestimate the effects of the SME supporting factor, as they are based on the SME definition as per the Council's General Approach, according to which a 23.8% reduction in terms of capital requirements would apply to up to EUR 1.5 million of loans granted to SMEs. However, the final CRR2 will increase this threshold from EUR 1.5 million to EUR 2.5 million. In addition, SME exposures above the threshold will still be subject to a reduction, which will amount to 15% (i.e. a de facto 85% risk weight).

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 47 banks.

266. In relation to corporate exposures:

- About 28.4% of the corporate exposures are reported as compliant with the CRR2 eligibility criteria for the supporting factor, whereas only 6% are compliant with the CRR eligibility criteria for the supporting factor.

- Applying the CRR2 SME supporting factor would lead to a further decrease of 0.4% in IRB RWA for the corporate exposure class under the Basel III central scenario, instead of an increase of 1.1%.

267. In relation to retail exposures:

- About 11.4% of the retail exposures are reported as compliant with the CRR2 proposal eligibility criteria for the supporting factor, whereas 6.9% are compliant with the CRR eligibility criteria for the supporting factor.

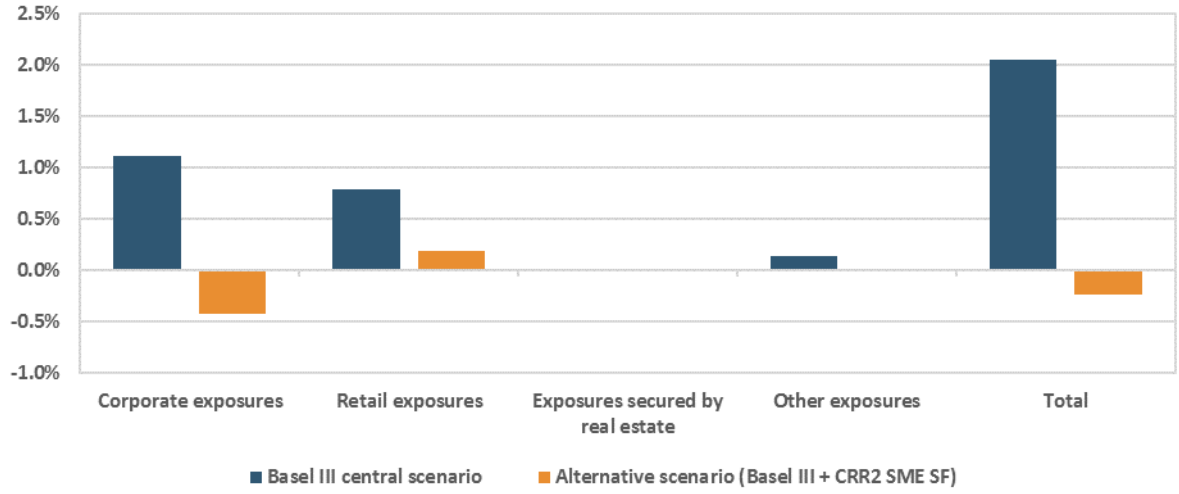
- Applying the CRR2 proposal SME supporting factor would reduce the increase in RWA for the retail exposure class by about 75%.

268. Overall, within the exposure classes eligible for the SME supporting factor (corporate and retail), the application of the CRR2 proposal SME supporting factor more than compensates for the increase in RWA due to the Basel III IRB reforms, leading to an overall decrease in RWA (Figure 61).

269. The second type of analysis takes into account an alternative baseline scenario, defined as the national implementation of the Basel framework at the reporting date (i.e. the CRR), modified to include the CRR2 proposal SME supporting factor (scenario B in Table 30). This reflects the fact that, when in 2027 the revised Basel III standards are implemented in the EU at their steady-state calibration, the CRR2, including the new rules on the SME supporting factor, will already be in force. It is therefore relevant to assess the impact of the finalised BCBS standards on a baseline regulatory framework that more closely resembles the actual EU framework at the date of implementation.

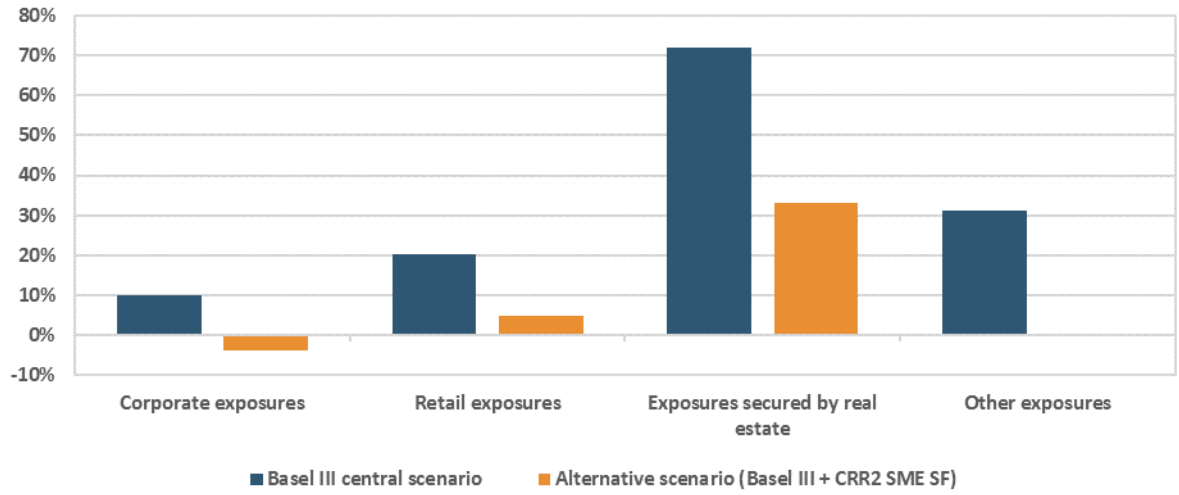
270. Against the alternative CRR2 proposal baseline scenario, two different scenarios of implementation of the revised Basel III standards are assessed: i) the Basel III central reform scenario (scenario C in Table 30) and ii) the central scenario incorporating the CRR2 proposal SME supporting factor (scenario D in Table 30). The results of these assessments are presented in Annex 2 with other results.

Figure 61 Percentage change in exposure class RWA due to application of SME supporting factor (relative to total IRB RWA)



Sources: EBA 2018-Q2 QIS data and EBA calculations.
Notes: Based on a sample of 47 banks. SME SF, SME supporting factor.

Figure 62 Percentage change in exposure class RWA due to application of SME supporting factor (relative to exposure class RWA)



Sources: EBA 2018-Q2 QIS data and EBA calculations.
Notes: Based on a sample of 47 banks. SME SF, SME supporting factor.

Infrastructure supporting factor

271. The CRR2 regulation introduces a 0.75 supporting factor applicable to the own funds requirement on compliant exposures to infrastructure projects,[64] treated under both SA and IRB (Art. 501a of the CRR2). This regulatory treatment is not part of the baseline scenario considered in this impact analysis, nor is it part of the central reform scenario (Basel III central reform scenario). The IRB

[64] Exposures to entities that operate or finance physical structures or facilities, systems and networks that provide or support essential public services.

regulatory treatment of project finance exposures included in the Basel III central reform scenario is described in the Basel III revised standards.

272. Similarly to standardised approach, this section of the report looks at the impact of the alternative baseline and reform scenarios concerning the implementation of preferential treatments for exposures to infrastructure projects in the IRB framework.

273. Table 32 lists all the scenarios considered and provides the description of each scenario. The first comparison is between the Basel III central scenario (scenario B in Table 32) and an implementation of the Basel III standards which also includes the CRR2 agreed rules on the project finance supporting factor (scenario C in Table 32). Both scenarios are assessed against a consistent baseline scenario (scenario A in Table 32).

274. Although the infrastructure lending supporting factor in theory can apply to any exposure class, the impact analysis in this report is limited to the exposure classes large and mid-market general corporates, SME treated as corporate and specialised lending, which are most likely to have exposures eligible for this treatment.

275. The data from the QIS sample shows that very few exposures from the IRB corporate and specialised lending portfolios are compliant with the eligibility criteria of the infrastructure projects supporting factor – 1% and 3% compliant exposures respectively.

276. When implemented as part of the Basel III revised framework the infrastructure projects supporting factor would decrease the average impact of the reform for the portfolios under consideration. Results are not shown in this report, and should be interpreted with caution, as they are driven by 12 institutions that identified compliant exposures within their portfolios. For the same reason additional analysis using CRR2 as a baseline scenario was not conducted.

Equity — impact based on the current CRR and revised Basel classification of equity exposures and phase-in implementation

277. This section aims to measure the impact of the final Basel III framework and phase-in arrangements on the RWA of equity exposures using the current CRR and final Basel III equity classifications.

278. The current framework distinguishes different approaches to calculate risk-weighted assets associated with equity exposures under the IRB approach:

- The simple risk-weight approach applies specific risk weight to the exposure value. The applicable RW depends on the type of equity exposure:
    i. equity exposures in sufficiently diversified portfolios get a 190% risk weight,
    ii. exchange-traded equity exposures get a 290% risk weight,
    iii. all other equity exposure get a 370% risk weight.

- The PD/LGD approach, under which risk-weighted assets associated with equity exposures are calculated using the same capital formulas as for exposures to corporates, institutions and central governments and central banks but applying equity specific risk parameters.

- The internal models approach calculates equity risk-weighted assets as the potential loss for the institution using value-at-risk models.

279. Article 49(4) of the CRR states that, under certain conditions, holdings in insurance companies (Article 49(1) of the CRR), intra-group exposures (Article 49(2) of the CRR) and exposures to institutions that are part of the same institutional protection scheme (Article 49(3) of the CRR) may be risk-weighted according to the SA or the IRB approach. Under the IRB approach, this means that these equity exposures would be currently risk-weighted using one of the three aforementioned methods.

280. The revised Basel III standards states that all equity exposures are subject to the SA, and the IRB approach is no longer an option under the revised Basel III framework for this type of exposures. This means that equity exposures that are currently risk-weighted using one of the aforementioned methods will be subject to the standardised risk weights (400%/100%/250%) under the revised standards.

281.

282. Similar to the revised Basel III classification, the RWA for total equity exposures decreases by -1.3% as a result of the Basel III. The largest decrease in RWA comes from other equity exposures (-0.9%), followed by holdings of own funds instruments (-0.4%).

283. Table 38 , panel A, shows the impact of the revised Basel III rules, including the breakdown according to the three new sub-categories of equity exposures and introducing the revised risk weights. The evidence from the QIS sample shows that there is a negative impact for the equity exposures under the IRB approach, which arises from the category other equity, in which most institutions concentrate their equity exposures. The data shows no impact for the category ‘equity holdings made pursuant to national legislated programmes’ and a small positive impact for the category ‘speculative unlisted’.

284. The negative impact for other equity could be the result of institutions being conservative in their application of the PD/LGD or internal model approaches, resulting in the application of an average risk weight lower than the 250% risk weight that corresponds to this equity category under the revised Basel standards. It could also be the result of institutions applying the simple risk-weight approach if the majority of exposures fall under the ‘all other equity’ category (which is risk-weighted at 370%).

285.

286. Similar to the revised Basel III classification, the RWA for total equity exposures decreases by -1.3% as a result of the Basel III. The largest decrease in RWA comes from other equity exposures (-0.9%), followed by holdings of own funds instruments (-0.4%).

287. Table 38 also shows in panel B the impact over the total SA RWA for equity exposures classified according to the current CRR classification:[65] equity exposures in sufficiently diversified portfolios, holdings of own funds instruments risk-weighted in accordance with Article 49(4) of the CRR and other equity exposures. The QIS data are collected on a consolidated basis, so the quantitative impact of the Basel III standards for intra-group exposures under Article 49(4) of the CRR cannot be measured within this report. The bucket other equity exposures includes all those exposures that are not in sufficiently diversified portfolios or holdings of own funds instruments risk-weighted in accordance with Article 49(4) of the CRR.

288. Similar to the revised Basel III classification, the RWA for total equity exposures decreases by -1.3% as a result of the Basel III. The largest decrease in RWA comes from other equity exposures (-0.9%), followed by holdings of own funds instruments (-0.4%).

Table 38 Percentage change in equity SA RWA (relative to total current SA RWA), per equity category

Panel A Equity categories classified in accordance with revised Basel III	Percentage	Panel B Equity categories classified in accordance with current CRR	Percentage
Exposures to certain legislative programmes	0.00	Equity exposures in sufficiently diversified portfolios (Article 155(2) of the CRR)	-0.08
Other equity	-1.48	Holdings of own funds instruments that are currently risk-weighted in accordance with Article 49(4) of the CRR	-0.39
Speculative unlisted	0.15	Other equity exposures	-0.86
Total equity	**-1.33**	**Total equity**	**-1.33**

Sources: EBA 2018-Q2 QIS data and EBA calculations
Note: Based on sample of 78 banks.

289. Regarding the implementation of the prohibition of the use of the IRB approach to the equity exposures and the application of the standardised approach revised risk weights, the Basel III text includes a five-year linear phase-in arrangement from the date of implementation of the Basel III standards. The applicable risk weights during the phase-in period are the same ones as applicable to equity exposures under the SA (see Table 34). Nevertheless, the revised framework states that during the phase-in period the risk weight should be the maximum between the applicable SA linear phase-in risk weight and the risk weight under the IRB approach.

290. Table 39 shows an approximation of the implementation of the phase-in arrangement as defined in the revised Basel III framework.[66] Results have been calculated using a top-down approach (the comparison between the IRB risk weight and the applicable SA risk weight during the phase-in period

[65] Separate data for traded equity exposures are not available in the QIS.

[66] The impact shown in Table 39 for year 5 shows the impact results after imposing the specific risk weights per equity category to the QIS standardised approach exposures. Results in Table 38 show the revised results as reported by the participating institutions.

has been done bank by bank using the average of the equity portfolio) and the IRB average risk weight is assumed to remain equal to the current framework. Therefore, results should be interpreted with caution. Table 39 shows that during year 0 and year 1 there is no impact on the IRB equity asset class, meaning that institutions would continue to apply risk weights under the IRB approach. During year 3 and year 4 some institutions would start applying the SA phase-in risk weight, which would mean an increase in RWA for those institutions. Nevertheless, on average, institutions show IRB risk weights higher than the SA risk weights, not only during the phase-in implementation, but also in the final year of implementation of the reform. Consequently, the negative impact associated with IRB equity exposures would be postponed to the fifth year after the implementation of the reform. Nonetheless, the phase-in arrangements are designed specifically to address sharp increases in own funds requirements. The impact shown in Table 39 should be read in conjunction with the EBA policy recommendation for the implementation of the phase-in arrangement for equity exposure.

Table 39 Percentage change in equity IRB RWA (relative to total current IRB RWA) during the phase-in implementation period

Equity Category	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
Exposures to certain legislative programs	0.00	0.00	0.00	0.00	0.00	0.00
Others	0.00	0.00	0.00	0.03	0.14	-1.47
Speculative unlisted	0.00	0.00	0.02	0.06	0.11	0.15
Total equity	**0.00**	**0.00**	**0.02**	**0.09**	**0.25**	**-1.32**

Sources: EBA 2018-Q2 QIS data and EBA calculations
Note: Based on a sample of 78 banks.

291. This section also aims to measure the sensitivity of equity exposures to different risk weights of equity exposures under Article 49(4) of the CRR. The scope of the risk-weight sensitivity is limited to these exposures because, among equity exposures, these are the only sub-groups for which risk weights are not clearly defined, since, according to Basel rules, these exposures should be deducted from CET1. Two scenarios have been analysed:

- scenario 1: application of the current SA risk weights;
- scenario 2: application of a 250% risk weight to all equity exposures under Article 49(4) of the CRR.

292. Scenario 1 will be translated into the application of a 100% risk weight to equity exposures under Article 49(4) of the CRR, which will result in a further reduction of the impact.

Table 40 Percentage change of equity SA RWA (relative to total current SA RWA), by scenario

Equity Category	Scenario 1 (100%)	Scenario 2 (250%)
Art. 155 (2) of the CRR	-0.08	-0.08
Art. 49 of the CRR	-1.16	-0.39
Other	-0.86	-0.86
Total equity impact	**-2.10**	**-1.33**

Sources: EBA 2018-Q2 QIS data and EBA calculations.

Note: Based on a sample of 78 banks.

4.2.3 Implementation and policy recommendations

IMPORTANT NOTE: This section includes only those policy recommendations on the IRB framework for credit risk for which QIS data was collected, as illustrated in this report. Additional recommendations on the IRB framework, and more detailed policy rationale, can be found in the EBA report 'Policy advice on the Basel III reforms: credit risk' accompanying this publication. **The numbering of the recommendations in this section is aligned with the numbering used in that accompanying report.**

Migration of exposures to the F-IRB

293. The EBA is of the view that the restriction of LGD modelling on exposures to i) large corporates, ii) institutions, iii) financial institutions treated as corproates is consistent with the intention to limit the variability of the internal models' RWA outcomes. The portfolios under consideration typically show a severe shortage of default data. Since realised LGDs can only be observed on defaulted exposures the estimation of the LGD parameter is often problematic in relation to the three targeted portfolios, leading to increased volatility of and uncertainty around the LGD estimates. The average impact of the measure is in this vein to be regarded as broadly intended. In the case of exposures to large corporates, the impact is of the migration is dampened by the downward revision of the F-IRB LGD parameters applicable to corporate exposures, which was introduced to further differentiate across asset classes the F-IRB LGD treatment.

Recommendation CR-IR 6: Limited scope of application of the AIRB Approach

As proposed in the final Basel III framework, exposures to large corporates, financial institutions treated as corporates and institutions should migrate to the F-IRB Approach in order to reduce the undue variability of the outcomes of internal models.

PD input floors

294. The EBA is of the view that the revised calibration of PD input floors is consistent with the intention to pose a backstop to excessively low parameter estimates, ensuring a conservative minimum level. The impact of the measure, particularly on low default portfolios, is for this reason to be regarded as broadly intended.

Recommendation CR-IR 9: PD input floors

The PD input floors should be raised from three basis points to five basis points as proposed in the final Basel III framework in order to reduce the undue variability and keep a conservative minimum level of the outcomes of internal models.

LGD regulatory values under F-IRB approach

295. The EBA is of the view that the revised calibration of the LGD regulatory values under the F-IRB approach increases the risk sensitivity of the framework, by among other things introducing a differentiated calibration between corporates' and institutions' LGD parameters. Increased sensitivity in the F-IRB approach is welcome, especially given the imposed migration of low default portfolios from the A-IRB to the F-IRB.

Recommendation CR-IR 11: LGD regulatory values

The new LGD regulatory values should be implemented as proposed in the final Basel III framework.

LGD input floors

296. The EBA is of the view that the revised calibration of LGD input floors is consistent with the intention to pose a backstop to excessively low parameter estimates, ensuring a conservative minimum level. The impact of this measure, particularly on exposures collateralised by collateral other than residential mortgages, is to be expected, given the newly introduced floors and collateral haircuts. With the implementation of the EBA Guidelines on PD and LGD estimation, the volatility of the LGD estimates is expected to decrease. To the extent that the implementation of the guidelines leads to an increase in the very low parameter estimates, the impact of the newly introduced LGD floors should also reduce.

Recommendation CR-IR 13: LGD input floors

The LGD input floors should be implemented as proposed in the final Basel III framework in order to reduce the undue variability and to keep conservative minimum levels of the outcomes of internal models. It should further be clarified that the haircuts used for calculation of the individual LGD input floors for secured and partially secured exposures should be based on the eligibility criteria of the A-IRB Approach.

Credit conversion factors (CCFs)

297. The EBA is of the view that the revisions of credit conversion factors in the IRB framework are consistent with the intention to pose a backstop to excessively volatile IRB estimates.

Recommendation CR-IR 16: Reduced scope of CCF modelling

The EBA supports the restriction of CCF to "*undrawn revolving commitments […], provided the exposure is not subject to a CCF of 100% in the standardised approach*". However, it is necessary to include in the CRR a precise definition of *'revolving commitment'*, such as facilities "*where customers' outstanding balances are permitted to fluctuate based on their decisions to borrow and repay, up to a limit established by the bank*."

Recommendation CR-IR 17: CCF regulatory values

The new CCF regulatory values and new buckets should be implemented as proposed in the final Basel III framework.

Recommendation CR-IR 18: CCF input floors
The new CCF input floors should be implemented as proposed in the final Basel III framework in order to reduce the undue variability and keep conservative minimum levels of the outcomes of internal models.

Clarification on the effective maturity of revolving exposures

298. The EBA is of the view that the clarification on the effective maturity introduced in the revised framework contributes to reducing undue variation in RWA calculation practices.

Recommendation CR-IR 20: Calculation of effective maturity for revolving facilities
The additional clarifications to the maturity parameter should be implemented as proposed in the final Basel III framework. In addition, Article 162 of the CRR on the calculation should be further clarified in order to ensure harmonised application.

Treatment of guarantees

299. The EBA is of the view that the requirement to use the SA or F-IRB on A-IRB guaranteed exposures whenever a direct exposure to the guarantor would have to be treated under the SA or F-IRB, as specified in the revised Basel III framework, may potentially lead to some contradictions and unintended consequences. For this reason, further clarifications are deemed necessary.

Recommendation CR-IR 24: Methods for the recognition of UFCP
Clarification should be provided on the methods for the recognition of the effects of UFCP in the case the protection provider is treated under the SA or under the F-IRB Approach. In addition, further clarifications should be provided on the split of exposures in the case of partial and pro-rata protection, especially with regard to the allocation of cash flows, costs and credit risk adjustments.

Recommendation CR-IR 25: Risk weight function under the substitution approach
Subject to certain eligibility criteria the effects of UFCP may be recognised through substituting risk parameters of the obligor with the risk parameters of the protection provider. Clarification should be provided that in this case the RW should be calculated based on the RW function applicable to the protection provider rather than that applicable to the original obligor.

SME Supporting factor

300. The removal of the SME supporting factor is the most appropriate recommendation from a prudential perspective. This is due to a number of factors:

a) As also shown in the EBA Report on SMEs and SME supporting factor[67] published in 2016, the introduction of the SME supporting factor has not resulted in a clear and marked decrease in SMEs' probability of being credit constrained, despite this being its specific aim.

b) The same EBA report also shows that the reduced capital requirements are not necessarily reflective of the underlying credit risk of SME exposures that are part of different asset classes, particularly with regard to the retail portfolio under the IRB approach.

c) Moreover, the 85% risk weight was introduced in the SA in order to align with the treatment of SMEs under the IRB approach: there, a lower correlation with the systematic risk factor is used in the risk weight function for exposures to SME with total annual sales between EUR 5 million and EUR 50 million.

d) Finally, removing the SME factor would avoid a 'double reduction' of capital requirements for SME exposures under the IRB approach. As a matter of fact, any potential lower level of risk for these type of exposures would already be captured through the rating of the counterparty. Furthermore, the current IRB framework already incorporates a 'Firm-size adjustment for small and medium-sized entities', based on their level of sales: paragraph 54 of the revised Basel III framework introduces a reduction in the correlation based on the total annual sale of the consolidated group, which directly reduces the RW applied to smaller counterparties.

Recommendation CR 2: SME supporting factor

The EBA considers that, due to the already more favourable treatment introduced via the final Basel III framework for CR-SA (an 85% RW for unrated corporate SMEs and a 75% RW for retail SMEs), the removal of the SME supporting factor is recommended. Instead, the final Basel III framework should be implemented without any further adjustments. The risk sensitivity of the IRB Approach already implies a differentiation of the risk weighting of the SME exposures, and any further adjustment leads to a "double counting" in the reduction of own funds requirements without any further risk-based justification.

Equity - Impact based on the current CRR and revised Basel classification of equity exposures and phase-in implementation

301. The revised Basel III standards do not allow the use of the IRB approach for equity exposures. The revised Basel III framework allows only the SA for this type of exposures. This means that equity

[67] EBA Report on SMEs and SME supporting factor.

exposures that are currently risk-weighted using one of the IRB methods for equity will be subject to the standardised risk weights (400%/100%/250%) under the revised standards.

302. The revised Basel III framework envisages a five-year implementation window for the prohibition of the use of the IRB approach to the equity exposures and the application of the standardised approach revised risk weights. Phase-in arrangements are designed specifically to address sharp increases in own funds requirements, therefore the application of such arrangements should be at the discretion of each institution.

RECOMMENDATION-CR-IR-7: Migration of equity exposures to SA

As proposed in the final Basel III framework, the equity exposures should migrate to the SA in order to reduce the undue variability of the outcomes of internal models. Institutions should be allowed to use a five-year linear phase-in arrangement in a consistent manner for all equity exposures. In case institutions choose not to apply the phase-in arrangements they should apply the full phase-in treatment under the SA from the date of application of the final Basel III framework in the EU.

6. Securities financing transactions (SFTs)

303. Securities financing transactions are a form of secured funding, whereby the borrower receives cash or securities in exchange for collateral. If the borrower (collateral giver) defaults during the lifetime of the SFT, the lender (collateral taker) can keep or sell the collateral to recover the loss.

304. Under the Securities Financing Transaction Regulation (SFTR), there are four types of SFTs: repurchase transaction (repos) or reverse repurchase transaction (reverse repos); sell/buy-back or buy/sell-back transactions; securities or commodities lending or borrowing transactions; and margin lending or borrowing transactions.

305. The different types of SFTs have similar economic benefits but can differ in many respects, including, among others, the purpose of the transaction, the nature of the collateral exchanged, the type of market participants, the existing market practices and the associated operational and legal risks.[68] Consequently, the results in this section are presented, where relevant, separately for each type of SFT.

306. The main changes for calculating counterparty credit risk exposures stemming from SFTs under the revised framework include the recalibration of the supervisory haircuts, the removal of the use of own estimates of collateral haircuts, the removal of the repo VaR method under the standardised approach to credit risk, and the change in the standardised formula for the calculation of the exposure value of SFTs covered by a master netting agreement. Moreover, one of the key novelties of the revised framework is the introduction of minimum haircut floors for non-centrally cleared SFTs in which financing against collateral other than government securities is provided to non-banks (see section 5.3.1 for more details).

307. The impact of the counterparty credit risk capital requirements for SFTs is a product of the changes related to the EAD and the associated risk weights. This section focuses on the impact on EAD, as the aim is to assess the impact of the revisions to the credit risk mitigation and counterparty credit risk frameworks. For completeness, the impact on risk-weighted assets is also presented, as ultimately this figure will be the one that affects capital requirements. However, it should be noted that the impact on RWA is affected by the wider changes to the credit risk framework as presented in Chapter 4.

6.1 Overview of SFT market

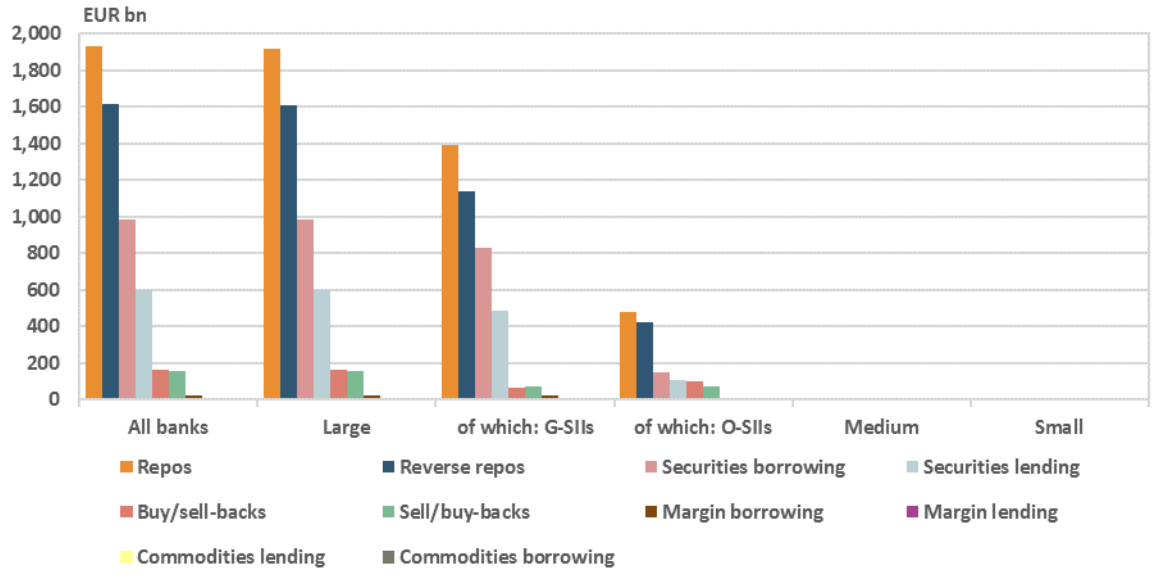
308. The results presented in this section are representative for the SFT market of the QIS sample. Repos and reverse repos are the main types of SFTs held by European institutions (Figure 63). In June 2018, the gross amounts of outstanding repos and reverse repos stood at around EUR 1.9 trillion and EUR

[68] See ESMA/2016/1415 Report on securities financing transactions and leverage in the EU and ESRB opinion to ESMA on securities financing transactions and leverage under Article 29 of the SFTR

1.6 trillion, respectively.[69] The volumes of buy/sell-back and sell/buy-back transactions were significantly smaller, amounting to EUR 167.0 billion and EUR 155.4 billion, respectively.[70] At EUR 596.7 billion and EUR 982.6 billion, the values of securities on loan and securities borrowed by European banks are significant, albeit smaller than repo markets. On the other hand, volumes of margin lending (EUR 8.9 billion) or borrowing transactions (EUR 26.4 billion) are lower, while commodity lending activity (EUR 272.1 million) appears to be small. Finally, European banks do not engage in commodity borrowing.

309. Based on the sample of participating banks, which includes only a very limited number of small banks, it seems that large banks are the main participants in the SFTs markets, particularly the G-SIIs, which conduct more than 70% of total SFTs volumes. This holds true across all SFT types, with two exceptions: i) O-SIIs and other large banks also conduct a significant proportion of the SFT activity in buy/sell-backs and sell/buy-backs (around 59% of total buy/sell-backs and 46.0% sell/buy-backs, with G-SIIs conducting around 39.7% and 47.8%, respectively); ii) only O-SIIs conduct commodities lending transactions. Medium-sized and small banks are mainly active in the repo markets, with limited activity in buy/sell-backs, sell/buy-backs and securities lending, and no operations in commodities borrowing/lending or margin lending/borrowing.

Figure 63 Gross amount of outstanding SFTs, by SFT type and bank size (EUR billion)



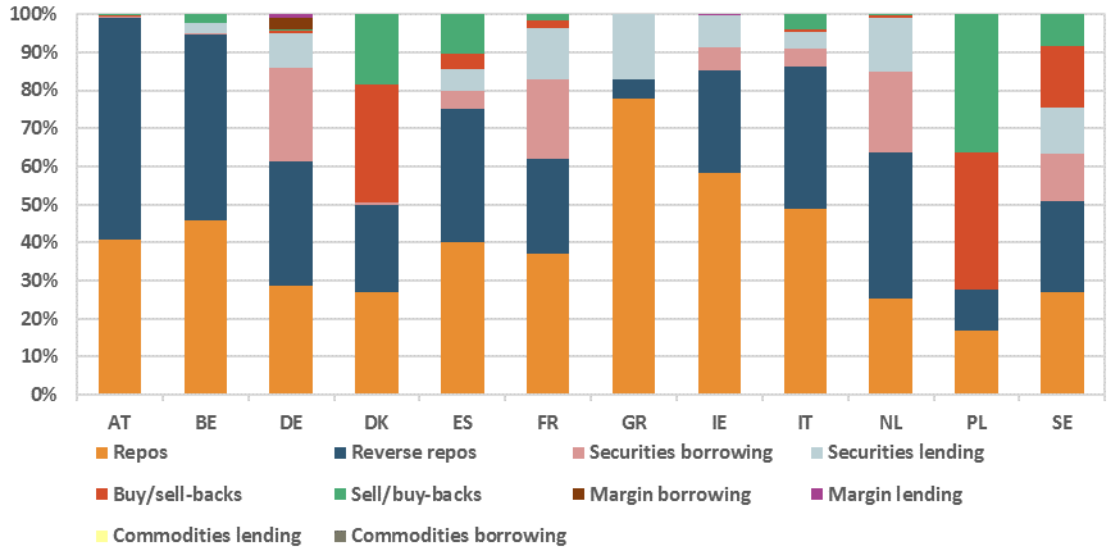
Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 89 banks: Large (62), of which G-SIIs (7), of which O-SIIs (41); Medium (22); Small (5).

[69] Note that the reported results are gross figures and are not adjusted for potential double counting of the same transactions conducted between pairs of institutions participating in the QIS exercise.

[70] This compares with an estimate of EUR 7.4 trillion in outstanding repos, reverse repos, sell/buy-backs and buy/sell-backs based on the ICMA repo survey for June 2018, which collects data from a sample of 59 financial groups operating in European financial centres. The data are not directly comparable due to differences in the underlying samples. In particular, many of the respondents participating in the ICMA repo survey are located in the UK, for which no data were collected in the QIS exercise, but are expected to hold a sizeable amount of the total outstanding repos, reverse repos, sell/buy-backs and buy/sell-backs. . The survey is available at https://issuu.com/icma/docs/icma_european_repo_market_survey_nu/1?ff&e=3507614/65211860

310. In most countries, reverse repos and repos account for more than 50% of total SFTs for the country (Figure 64). Buy/sell-backs and sell/buy-backs are common in Denmark (49.5% of total SFTs in the country), Poland (72.4% of total), Sweden (24.6% of total). Securities lending and borrowing represent a large proportion of total SFTs in the country for Germany (33.4% of the total), France (34.4% of total), the Netherlands (35.1% of total) and Sweden (24.5% of total).

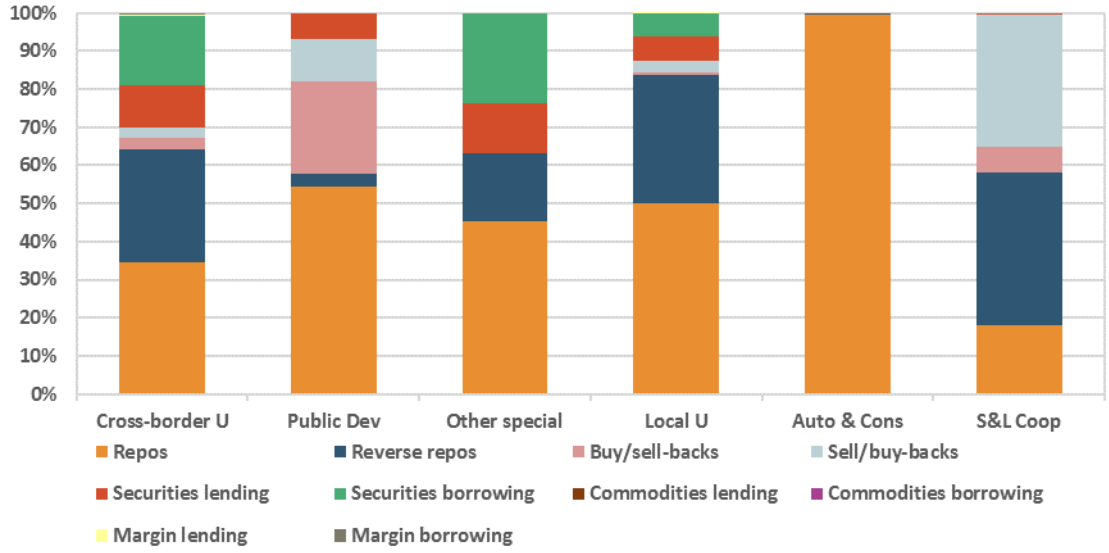
Figure 64 Breakdown of gross amount of outstanding SFTs, by SFT type and country



Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 89 banks: AT (6), BE (4), DE (10), DK (4), EE* (1), ES (9), FI* (1), FR (8), GR (3), HR* (2), HU* (1), IE (9), IT (15), LT* (1), LU* (2), NL (3), NO* (2), PL (8), PT* (2), SE (7).
* Not shown in the chart because fewer than three entities in the cluster.

311. Most business models engage primarily in repos and reverse repos (Figure 65). A few notable exceptions are public development banks and savings and cooperative banks, for which sell/buy-backs and buy/sell-backs constitute a sizeable proportion of the total SFTs for the business model, and cross-border universal banks and other specialised banks, for which securities lending and borrowing account for more than a third of the total in the business model.

Figure 65 Breakdown of gross amount of outstanding SFTs, by SFT type and business model

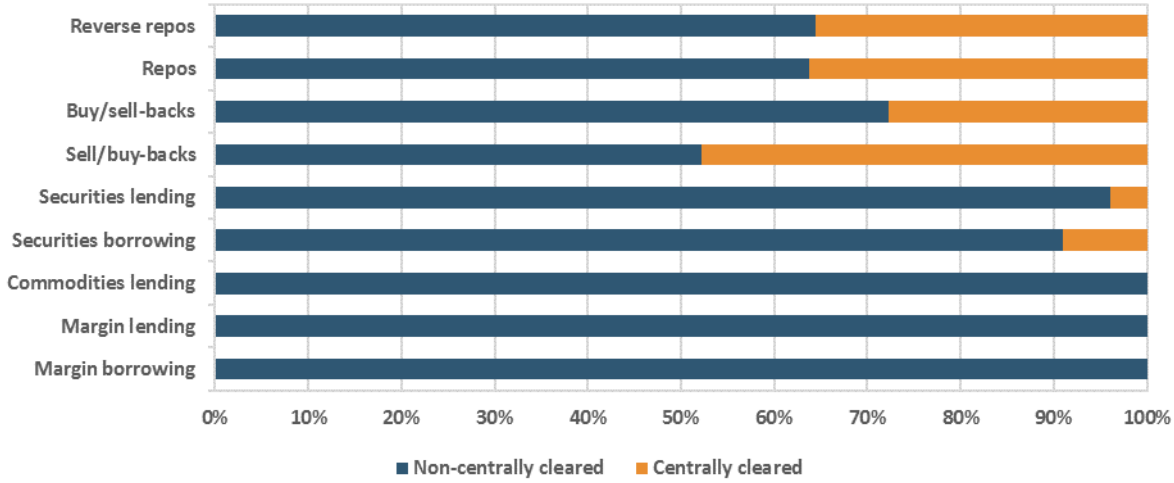


Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 89 banks: Cross-border U (32), Public Dev (3), Mortgage* (2), Other special* (6), Local U (35), Auto & Cons (4), S&L Coop (11), Private* (1), Custody* (2), CCP* (1), Merchant* (1).
* Not shown in the chart because fewer than three entities in the cluster.

312. SFTs can be traded bilaterally, through a third party agent (tri-party agreement) or cleared through a CCP. The majority of SFTs are not centrally cleared (**Figure 66**), as, unlike derivatives, they are not subject to any mandatory clearing requirements.[71] Approximately 36.0% of all outstanding repos and reverse repos are centrally cleared. Comparable proportions of central clearing are observed for sell/buy-backs (47.8% are centrally cleared) and buy/sell-backs (27.7% are centrally cleared). On the other hand, the proportions of securities borrowing and lending transactions that are centrally cleared are small (9.1% and 3.9% respectively), while all commodity lending transactions and margin borrowing/lending transactions are uncleared.

[71] The European Market Infrastructure Regulation (EMIR) includes the obligation to centrally clear certain classes of over-the-counter (OTC) derivatives contracts through central counterparty clearing. See Regulation (EU) 648/2012 of the European Parliament and of the Council of 4 July 2012 on OTC derivatives, central counterparties and trade repositories.

Figure 66 Proportion of central cleared SFTs, by SFT type (% of total gross amount of outstanding SFTs)

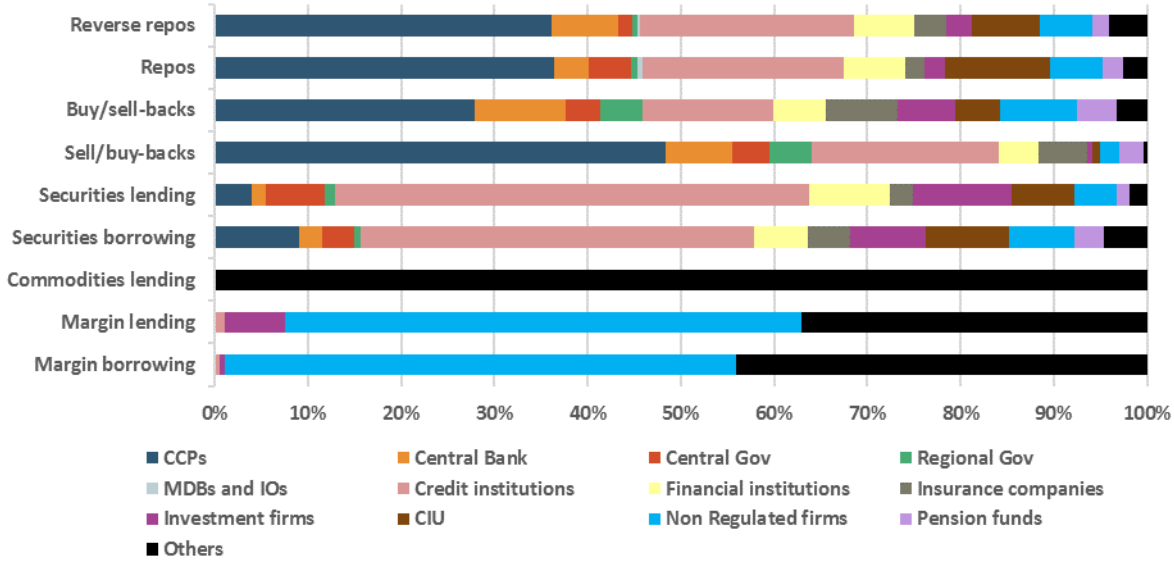


Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 89 banks.
* Commodities borrowing is not shown in the figure due to zero gross amount of outstanding SFTs

313. European banks engage in SFTs with a wide range of counterparties (Figure 67). For repos and reverse repos, CCPs (EUR 1.3 trillion or 36.3% of the total) and credit institutions (EUR 778.7 billion or 22% of the total) account for the largest share. CIUs (EUR 331.2 billion or 9.4% of the total), central banks and central governments (EUR 298.7 billion or 8.5% of the total), other financial sector entities (EUR 231.2 billion or 6.6% of the total) and non-regulated entities (EUR 198.8 billion or 5.7% of the total) also constitute important counterparties in the repo market.

314. Securities lending and borrowing transactions are largely interbank: the vast majority of the securities lent (EUR 304.5 billion) and borrowed (EUR 416.3 billion) are with credit institutions (45.5% of the total). Other prominent counterparties include Investment firms (9.2% of the total), CIUs (8.1% of the total) and financial sector entities (6.8% of the total). In contrast, commodity lending and margin borrowing/lending are highly concentrated in a few counterparties, such as non-regulated entities and other unspecified counterparties.

Figure 67 Breakdown of gross amount outstanding in SFTs, by counterparty and SFT type (% of total gross amount of outstanding SFTs)

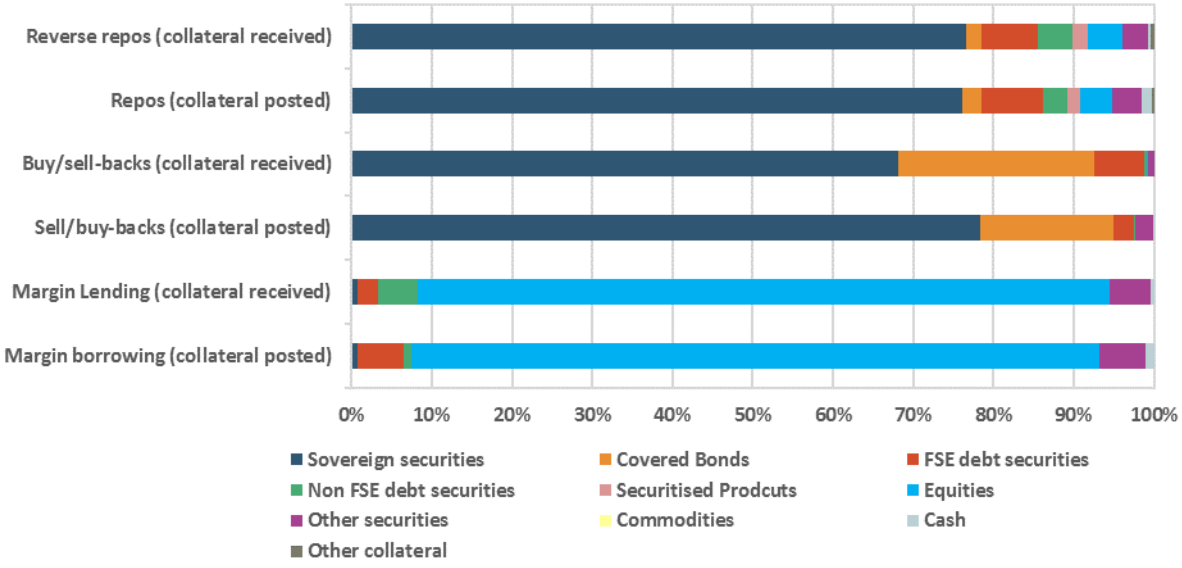


Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 89 banks.
* Commodities borrowing is not shown in the figure due to zero gross amount of outstanding SFTs

315. Almost 90.0% of repos and reverse repos are collateralised by debt securities (Figure 68), with the vast majority issued by sovereign or sovereign-like counterparties (i.e. central governments, central banks, regional governments and local authorities, public sector entities, multilateral development banks and international organisations). The same holds true for buy/sell-backs and sell/buy-backs; more than 99.1% of buy/sell-backs (97.7% of sell/buy-backs) are collateralised by debt securities, of which 68.1% (78.3%) are sovereign securities and 24.4% (16.6%) are covered bonds. On the other hand, for margin lending and margin borrowing the main type of collateral used is equities.[72]

[72] Results for commodities lending/borrowing are not shown due to limited data.

Figure 68 Breakdown of gross amount outstanding in SFTs, by collateral and SFT type (% of total gross amount of outstanding SFTs): repo, reverse repo, buy/sell-backs and sell/buy-backs



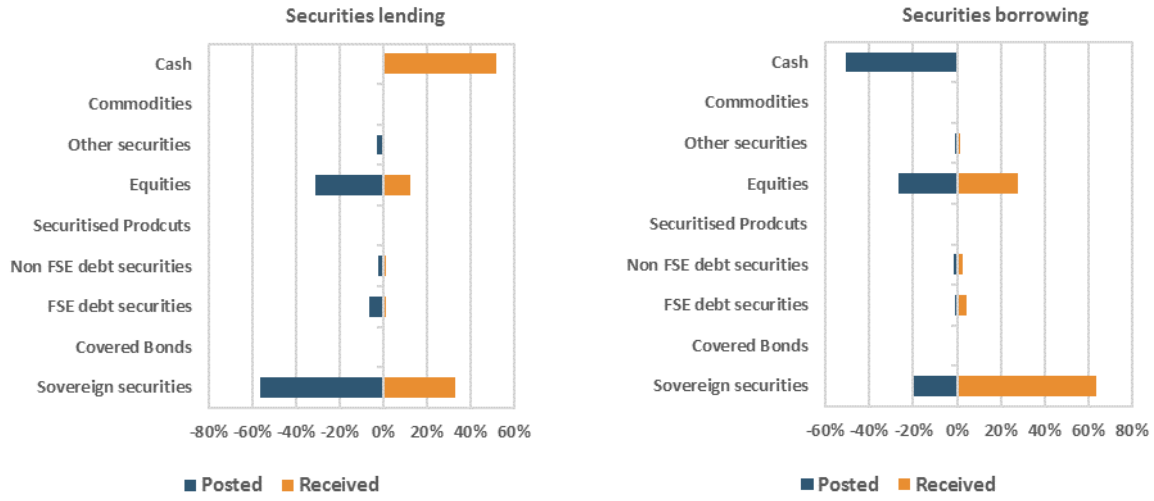
Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 89 banks.

316. The main type of securities on loan is sovereign debt securities, accounting for 56.4% of the total (

317. Figure 69 Breakdown of gross amount outstanding in SFTs, by collateral and SFT type (% of total gross amount of outstanding SFTs): . This compares with 31.2% for transactions lending out equities and 6.2% for transactions lending out debt securities issued by financial sector entities. Most securities on loan are collateralized by cash (51.6% of the total collateral received) and sovereign or sovereign-like debt securities (32.9%).

318. European institutions borrow mainly sovereign debt securities (63.3% of the total securities borrowed) and equities (28.0%). They mainly back up these borrowed securities by posting cash (50.5% of the collateral posted), equities (26.9%) and sovereign or sovereign-like debt securities (19.4%).

Figure 69 Breakdown of gross amount outstanding in SFTs, by collateral and SFT type (% of total gross amount of outstanding SFTs): securities lending and securities borrowing



Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 89 banks.

6.2 Impact of the overall reform

319. The final Basel III framework, including the introduction of the minimum haircut floor framework, results in a decrease in SFT EAD of -0.7% for all banks (Table 41). Data quality is such that the results should be interpreted with caution, as they are driven by a limited number of banks. Large banks experience a decrease of -0.7%, while medium banks experience an increase of 0.1%. The majority of institutions show no impact, with only a few institutions experiencing significant negative or positive impacts.

320. The changes in SFT RWA are driven not only by the changes in the SFT EAD but also by the wider changes in the risk weights as revised in the credit risk framework. On average, banks experience an increase in SFT RWA of 10.4%. O-SIIs experience a large increase driven by one outlier. As observed in Figure 67, one of the important categories of counterparties in SFTs is credit institutions. This exposure class generally experiences an increase in RWA under both the SA and the IRB (see section 4.1 and 4.2), which could be one of the reasons explaining the increase in SFT RWA.

Table 41 Percentage change in SFT EAD and SFT RWA (relative to total SFT EAD and SFT RWA, respectively), by bank size

Bank size	EAD	RWA
All banks	-0.7	10.4
Large	-0.7	10.4
Of which: G-SIIs	-0.9	1.0
Of which: O-SIIs	-0.5	28.3
Medium	0.1	8.2

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 46 banks: Large (34), of which: G-SIIs (3), of which: O-SIIs(24); Medium (10); Small*(2).
* Not shown in the chart because fewer than three entities in the cluster.

Table 42 Distribution of percentage change in SFT EAD and SFT RWA (relative to total SFT EAD and SFT RWA, respectively), all banks

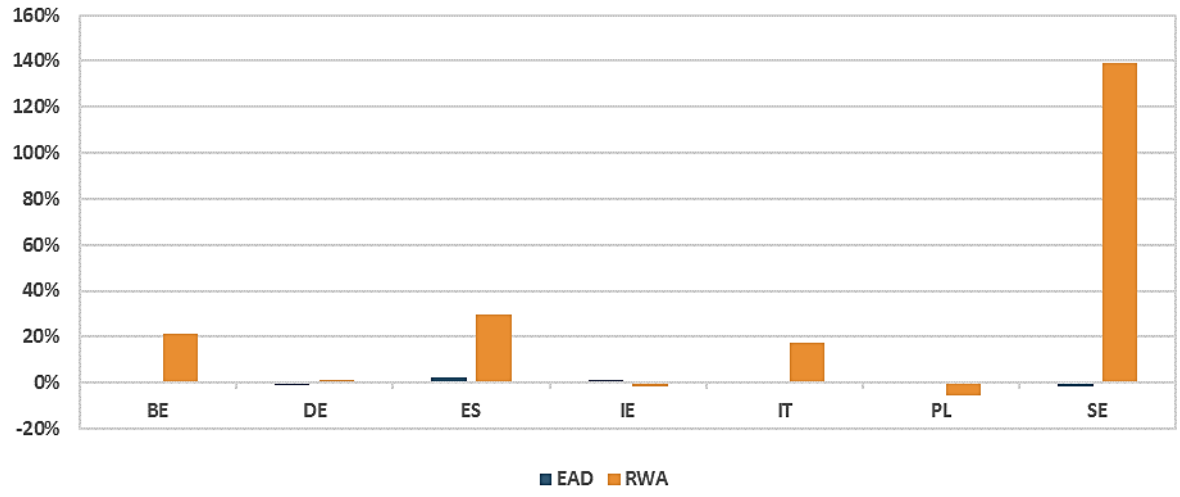
Percentile	EAD	RWA
5th percentile	-33.9	-23.1
25th percentile	0.0	-5.1
Median	0.0	0.0
75th percentile	0.0	13.5
95th percentile	67.0	107.7

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 46 banks.

321. For most countries, the impact clusters around 0%: half of the countries experience a slight increase in SFTs EAD, and the other half a slight decrease (Figure 70). Similarly, the impact is generally close to 0% for most business models (

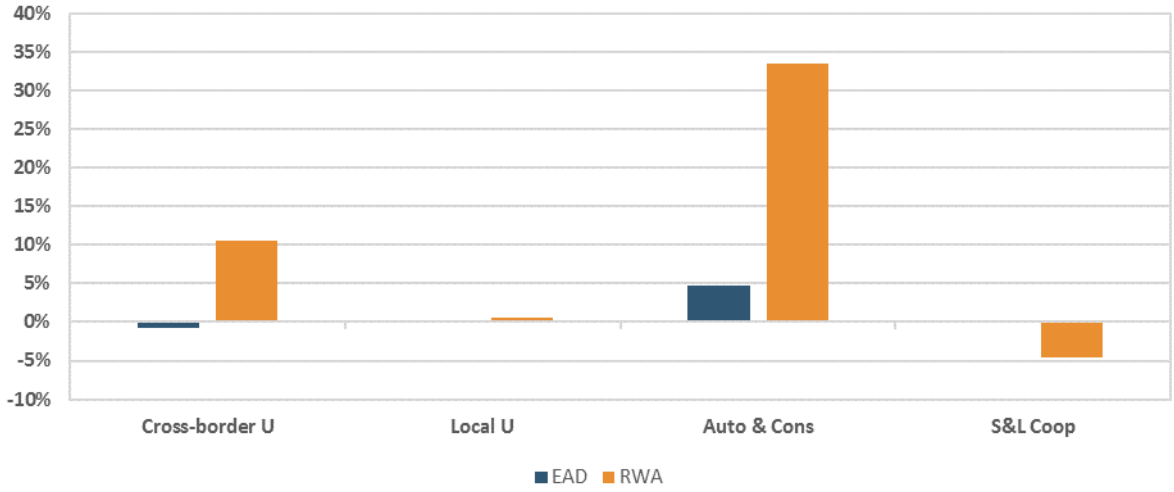
322. Figure **71**).

Figure 70 Percentage change in SFT EAD and SFT RWA (relative to total SFT EAD and SFT RWA, respectively), by country



Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 53 banks: AT* (1), BE (3), DE (9), DK* (2), EE* (1), ES (4), GR* (2), HR*(2), IE (4), IT (9), LU* (1), NL* (1), PL (7), PT* (2), SE (5).
* Not shown in the chart because fewer than three entities in the cluster

Figure 71 Percentage change in SFTs EAD and SFTs RWA (relative to total SFT EAD and SFT RWA, respectively), by business model



Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 53 banks: Cross-border U (16), Public Dev* (2), Mortgage* (2), Other special* (2), Local U (23), Auto & Cons(3), S&L Coop (3), Custody* (2).
* Not shown in the chart because fewer than three entities in the cluster.

323. Zooming in the impact at regulatory approach level, the SFT EAD increased by 3.6% for FCCM(SE) and 2.7% for FCCM(OE) with no master netting. This could be explained by the general increase in the supervisory haircuts and the removal of own estimates. On the other hand, the impact on FCCM(OE) and FCCM(SE) with master netting master netting is negative, potentially reflecting the changes in the standardised formula for the calculation of the exposure value of SFTs covered by a master netting agreement, which better accounts for diversification and correlation. As could be expected, the changes for FCSM, repoVaR and IMM are small, as these methods are not directly affected by the reforms.

Table 43 Percentage change in current approach SFT EAD and SFT RWA (relative to current approach SFT EAD and SFT RWA, respectively)

Method	EAD	RWA
FCSM	-1.3	24.3
FCCM (SE) – master netting	-7.1	-18.8
FCCM (OE) – master netting	-2.9	8.6
FCCM (SE) – no master netting	3.6	21.9
FCCM (OE) – no master netting	2.7	-17.4
Repo VaR	0.0	-12.3
IMM	-0.5	16.1

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 46 banks.

324. Institutions using the FCCM(SE) with or without master netting agreement exposures are the main contributors to the overall change in SFT EAD (Table 44), as these are the most common approaches

to calculating SFT EAD (see Annex 3). The positive impact on FCCM(SE) with no master netting is offset by the negative impact on FCCM(SE) with master netting, resulting in an overall impact close to zero.

Table 44 Percentage change in current approach SFT EAD and SFT RWA (relative to total SFT EAD and SFT RWA, respectively)

Method	EAD	RWA
FCSM	0.0	0.2
FCCM (SE) – master netting	-1.3	-3.8
FCCM (OE) – master netting	-0.1	0.1
FCCM (SE) – no master netting	1.0	6.8
FCCM (OE) – no master netting	0.0	-0.2
Repo VaR	0.0	0.0
IMM	-0.2	7.4
Total	**-0.7**	**10.4**

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 46 banks.

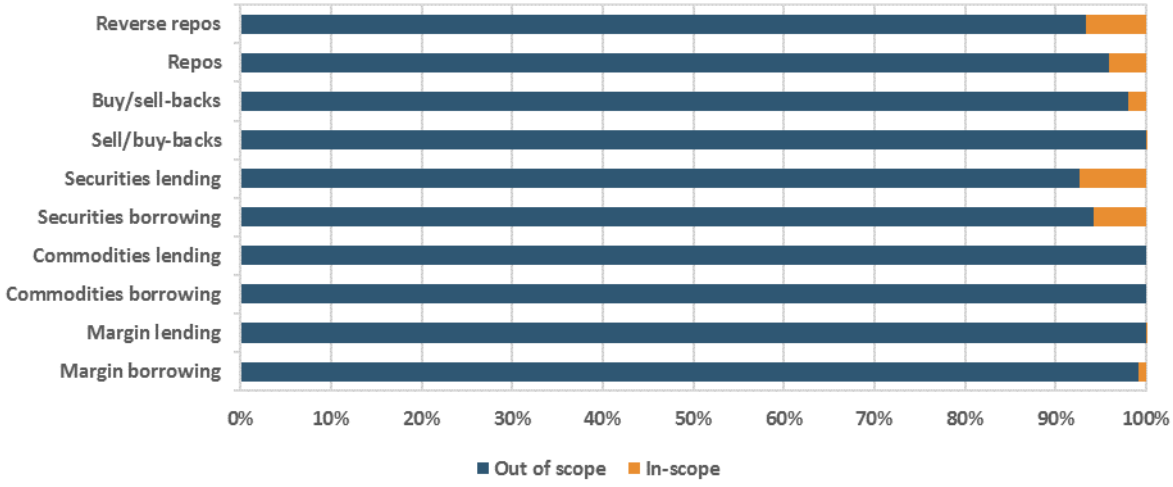
6.3 Individual reforms and scenario analysis

6.3.1 Minimum haircut floor framework

325. The BCBS revised framework introduces the minimum haircut floor framework for non-centrally cleared SFTs in which financing against collateral other than government securities is provided to counterparties not subject to prudential requirements consistent with international norms, thus addressing a recommendation from the FSB to apply haircut floors to certain SFTs with non-banks, with the aim of limiting the build-up of excessive leverage outside the banking system and to helping reduce the procyclicality of that leverage. This framework also applies to collateral upgrade transactions with these same counterparties. SFTs that do not meet the haircut floors must be treated as unsecured loans to the counterparties.

326. Measured by the gross amount outstanding, 7.4% of SFTs will fall in the scope of the minimum haircut floor (Figure 72). Most of the in-scope transactions are repos, reverse repos, and securities lending and borrowing transactions.

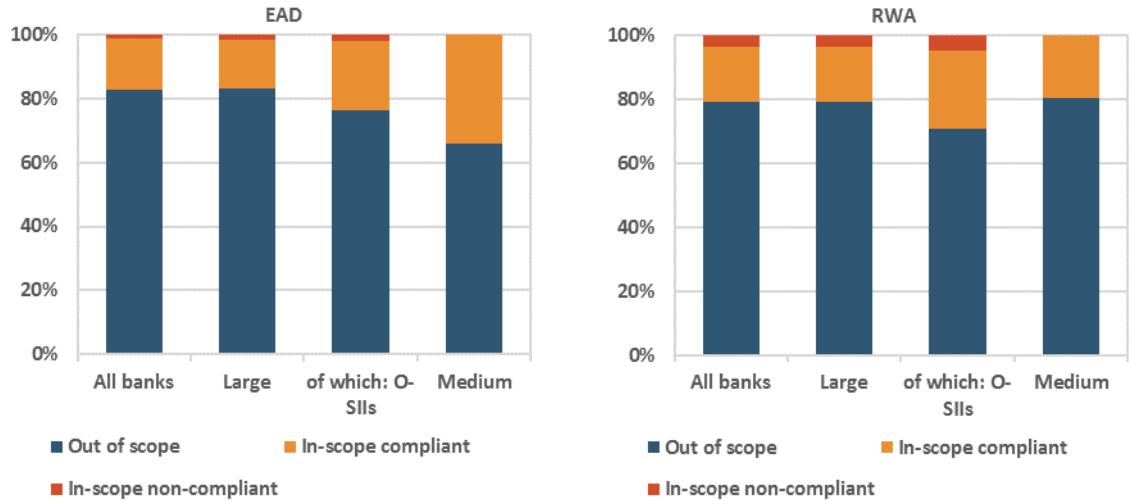
Figure 72 Proportions of SFTs in-scope of the minimum haircut floor framework, by SFT type (% of total gross amount of outstanding SFTs)



Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 89 banks.

327. On average, 17.4% of the total SFT EAD falls in the scope of the minimum haircut floor framework, and 15.9% of the total is compliant with the minimum haircut floors (Figure 73).[73] The percentage of in-scope SFTs is higher for O-SIIs (23.6% including21.5% compliant) and medium banks (34.3%, of which all compliant).

Figure 73 Proportions of current SFT EAD and SFT RWA compliant with the minimum haircuts (% of total current SFT EAD and SFT RWA, respectively)



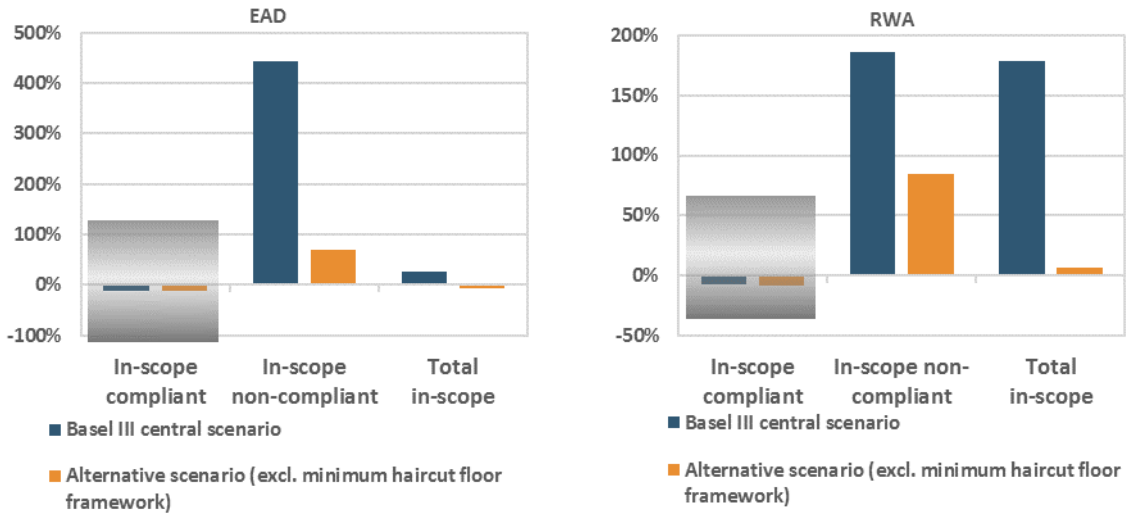
Sources: EBA 2018-Q2 QIS data and EBA calculations.

[73] The percentages are calculated based on the SFT EAD and RWA as measured under the current framework. If the revised SFTs EAD and RWA are used, the proportion of in-scope SFTs increases to 22.1% (including8.1% not compliant) for EAD and to 47.0% (including 34.2% not compliant) for RWA.

Note: Based on a sample of 39 banks: Large (28), of which G-SIIs* (2), of which O-SIIs (21); Medium (9); Small* (2).
* Not shown in the chart because fewer than three entities in the cluster.

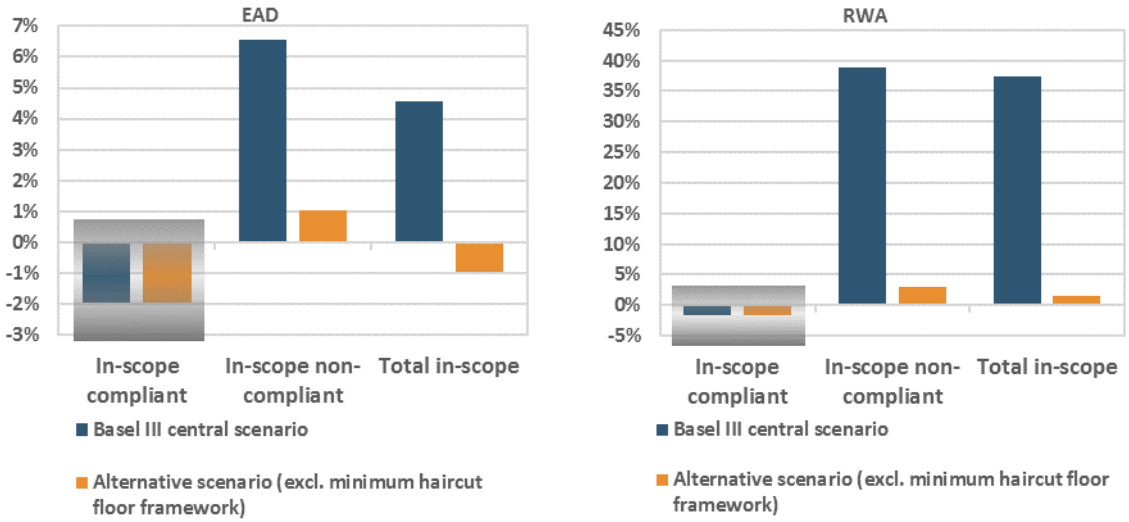
328. As expected, the introduction of the minimum haircut floor framework is found to have a sizeable impact on non-compliant SFT EAD and RWA (Figure 74). Data quality is such that the large increase should be interpreted with caution, as it is exclusively driven by a very limited number of institutions that identified non-compliant in-scope SFTs within their portfolios.

Figure 74 Percentage change in in-scope SFTs EAD and RWA (relative to in-scope SFT EAD and RWA, respectively)



Sources: EBA 2018-Q2 QIS data and EBA calculations.
Notes: Based on a sample of 39 banks. The alternative scenario, assumes that institutions will adjust their haircuts to meet the minimum haricuts.

Figure 75 Percentage change in in-scope SFT EAD and RWA (relative to total SFT EAD and RWA, respectively)



Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 39 banks.

6.4 Implementation and policy recommendations

IMPORTANT NOTE: This section includes only those policy recommendations on the SFT framework for which QIS data was collected, as illustrated in this report. More detailed policy rationale can be found in the EBA report "Policy Advice on the Basel III reforms: Securities Financing Transactions" accompanying this publication. **The numbering of the recommendations in this section is aligned with the numbering used in that accompanying report.**

329. In the light of the QIS results as well as the feedback from the qualitative questionnaire, the revisions for calculating exposure values for CCR of SFTs, with the exception of the minimum haircut floors framework, should be implemented in the EU, ensure alignment with the international standards and meet the objectives of the reforms.

Recommendation SFTs 1: Basel III post-crisis reforms on the calculation of the exposure values of SFTs except the minimum haircut floors framework

The EBA supports the introduction in the EU of the Basel III post-crisis reforms affecting the calculation of exposure values of counterparty credit risk exposures stemming from SFTs with the exception of the introduction of the minimum haircut floors framework for SFTs discussed in Recommendation SFTs 2.

6.4.2 Minimum haircut floor framework

330. For the reasons that are elaborated in the policy report, the EBA proposes withholding the implementation of the minimum haircut floor framework in the EU at this stage and suggests that further analysis should be made before proceeding with the implementation.

Recommendation SFTs 2: Introduction of the minimum haircut floors framework for SFTs

The EBA shares the cautious stance taken by the ESMA and the European Commission on the introduction of numerical haircut floors for SFTs, and recommends at this stage to withhold the implementation in the EU of the minimum haircut floors framework for SFTs in the capital framework as designed in the Basel III post-crisis reforms standards. In addition, if numerical haircut floors for SFTs were to be introduced in the EU, the EBA is of the view that this should occur via market regulation, but only after further analyses and recommendations are provided by market authorities and systemic risk authorities.

7. Market risk (FRTB)

331. In January 2019, the BCBS published the final fundamental review of the trading book (FRTB) standards, which replaces an earlier version of the standards, published in January 2016.[74] Given that at the time of the data collection launch, the January 2019 FRTB standards had not yet been published, this report assesses the impact of the 2016 FRTB standards. A detailed analysis on the 2019 FRTB standards will follow in a separate report later this year. At this stage, the EBA expects the impact figures to be subject to a significant level of data uncertainty and high variability across banks, due to a number of implementation choices that need to be fully clarified during the implementation phase of the FRTB.[75] Thus, the results of this section should be interpreted with caution.

7.1 Impact of the overall reform

332. The impact of the 2016 FRTB standards is, on average, 100.0% (Figure 76).[76] The impact is heterogeneous between sizes, with large institutions (which represent 81% of the sample) driving the average results. The average increase for the G-SIIs is somewhat higher, standing at around 124.3%, whereas O-SIIs experience a subtler impact (70.0%). SA-only institutions experience a slightly higher impact (115.5%) than IMA institutions (97.8%).

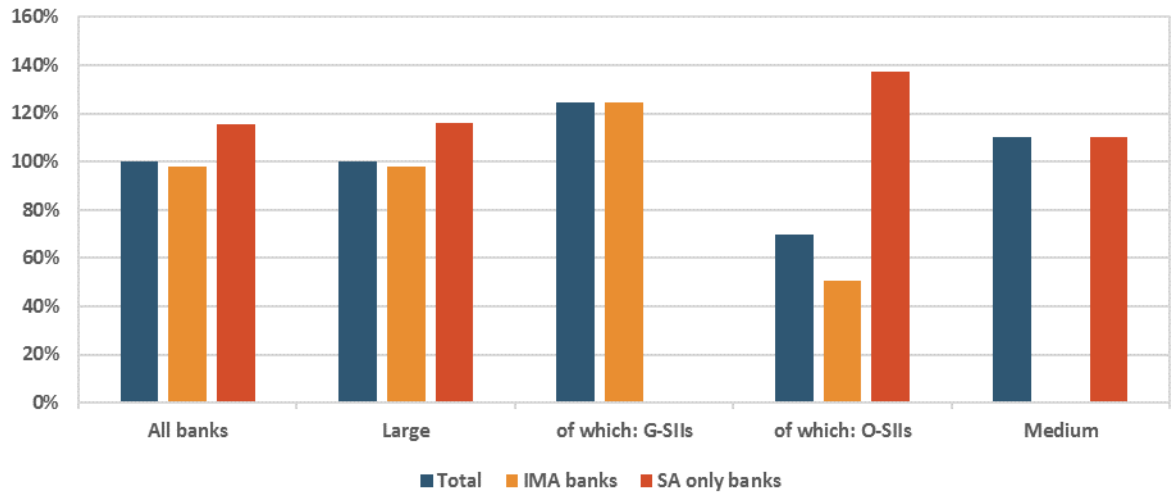
333. However, the average impact masks significant heterogeneity across banks (Table 45), with the impact of the median bank standing at 67.5%. The interquartile range spans from an increase of 28.6% to 146.8%, with a limited number of institutions experiencing a negative impact.

[74] https://www.bis.org/bcbs/publ/d352.htm.

[75] See EBA Roadmap for the new market and counterparty credit risk approaches (2019).

[76] The impact figures are not adjusted, unlike the published numbers accompanying the 2019 FRTB package on the treatment of the non-modellable risk factor (NMRF) component of the market risk capital requirements.

Figure 76 Percentage change in market risk RWA (relative to total current market risk RWA), by bank size



Sources: EBA 2018-Q2 QIS data and EBA calculations.
Notes: Based on a sample of 53 banks: Large (43), of which G-SII (6), of which O-SII (31); Medium (8); Small* (2). IMA banks are banks that reported IMA-based capital charges and SA-based capital charges for both the current and FRTB frameworks. SA-only banks are banks that reported only SA-based capital charges for both the current and FRTB frameworks.
* Not shown because fewer than three entities in the cluster.

Table 45 Distribution of percentage change in market risk RWA (relative to total current market risk RWA), all banks

Percentile	Percentage
5th percentile	-61.9
25th percentile	28.6
Median	67.5
75th percentile	146.8
95th percentile	279.4

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Notes: Based on a sample of 53 banks.

8. CVA

334. The credit valuation adjustment (CVA) is an adjustment to the fair value (or price) of derivatives and SFTs to account for the potential default of the counterparty. Hence, CVA is often viewed as the price of counterparty credit risk. CVA varies with changes in the credit quality of the counterparty as well as the market risk factors that affect the exposure value of derivatives and SFTs. The purpose of the CVA capital requirement is to capitalise against the risk of loss due to changes in CVA.

335. The current framework prescribes two methods for calculating CVA capital requirements: the advanced method[77] and the standardised method. Both methods are designed to capitalise against variability in CVA that stems from changes in the counterparty's credit spread, ignoring any variability driven by market risk factors. As an alternative to these methods, in Europe smaller and less sophisticated institutions are allowed to apply a multiplication factor to their counterparty credit risk capital requirements, instead of calculating CVA capital requirements.

336. The CVA capital requirement applies to all derivatives except those centrally cleared through a qualifying CCP, and to SFTs if the competent authority deems that the CVA risks arising from these transactions are material. In Europe, a series of transactions are exempted from the scope of the CVA capital requirement. These include: client's transactions with clearing members, certain transactions with non-financial sector entities, intragroup transactions, transactions with pension funds and transactions with sovereigns.

337. The Basel III framework removes the use of an internally modelled approach, and introduces two new approaches: the standardised approach (SA-CVA) and the basic approach (BA-CVA), which comprises two alternatives one partially recognising hedges (full BA-CVA) and the other not recognizing hedges (reduced BA-CVA). In addition, a bank with a small derivative business may calculate its CVA capital charge as a simple multiplier of its counterparty credit risk charge. The revised rules capture all CVA risks, including the exposure component of CVA risk along with its associated hedges. Moreover, they align better with industry practices for accounting purposes and the new FRTB standards.

8.1 Impact of the overall reform

338. The impact analysis in this section compares two scenarios: the first scenario is the implementation of the Basel III central scenario (blue bars), and the alternative scenario (orange bars) is based on the scope of transactions currently subject to the capital requirements for CVA risk under the CRR (see Table 46 for details). Both scenarios assess the impact of the new CVA approaches but with different scopes of application. The difference in scope stems from the removal of EU exemptions and the introduction of fair-valued SFTs under the Basel III central scenario. The central scenario is the one included in the cumulative analysis in relation to CVA risk (see **Table 14** for details).

[77] Institutions that have been granted permission to use the internal model for the specific risk of debt instruments and the IMM must use the advanced method to calculate CVA capital requirements.

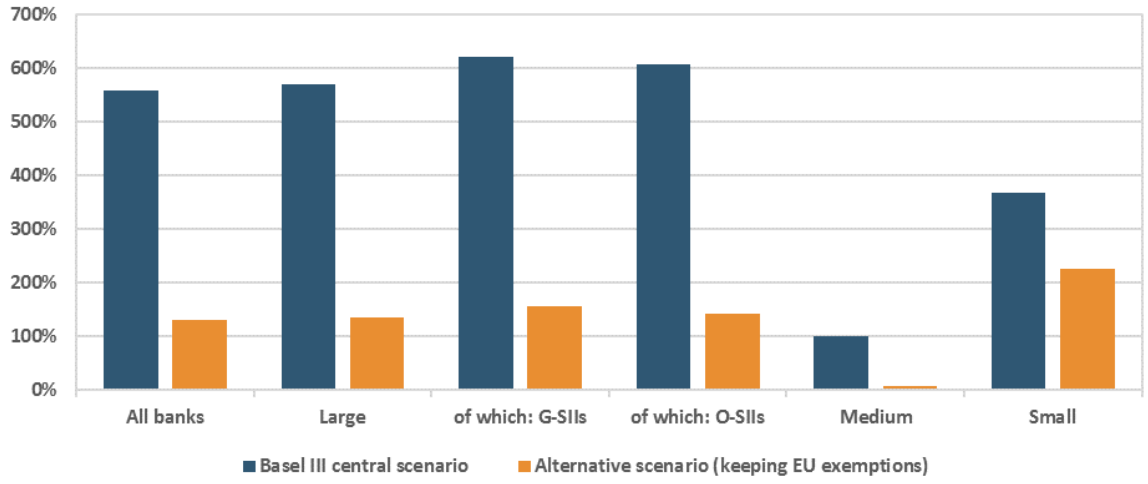
Table 46 Scenario specification for impact on CVA RWA

Scenario	Description
Basel III central scenario	**Scope of application:** Based on the revised Basel framework: • all derivatives except those transacted directly with a qualified central counterparty • SFTs that are fair-valued by a bank for accounting purposes (fair-valued SFTs) **CVA methods:** Based on the revised Basel framework.
Alternative scenario (keeping EU exemptions)	**Scope of application:** Based on the current EU framework (i.e. Article 382 of the CRR):. • all derivatives except those transacted directly with a qualified central counterparty • SFTs for which the national competent authority deems that these transactions have material CVA risk The following transactions are exempted: • client's transactions (Art. 382(3) of the CRR) • qualifying transactions with non-financial counterparties (Art. 382(4)(a) of the CRR) • intra-group transactions (Art. 382(4)(b) of the CRR) • pension funds (Art. 382(4)(c) of the CRR) • sovereign transactions (Art. 382(4)(d) of the CRR) **CVA methods:** Based on the revised Basel framework.

339. Under the Basel III central scenario, the average impact of moving from the current to the revised framework on the CVA RWA is 558% (see blue bars of Figure 77), driven by large institutions. Large institutions are more affected than medium-sized and smaller institutions (average impact of 572% in comparison with 102% and 369%, respectively). The G-SIIs appear to be the most affected, with the average impact reaching 622%. A comparison of the impact across different calculation approaches under the current framework, shows that banks using the standardized method experience a higher impact than banks using the advanced method (Figure 78). The median bank experiences a much lower impact, at 208%. For most banks (more than 75% of sample banks), the revised CVA framework leads to higher capital requirements; only for some banks can a decrease in capital requirements be observed under the revised framework relative to the current framework.

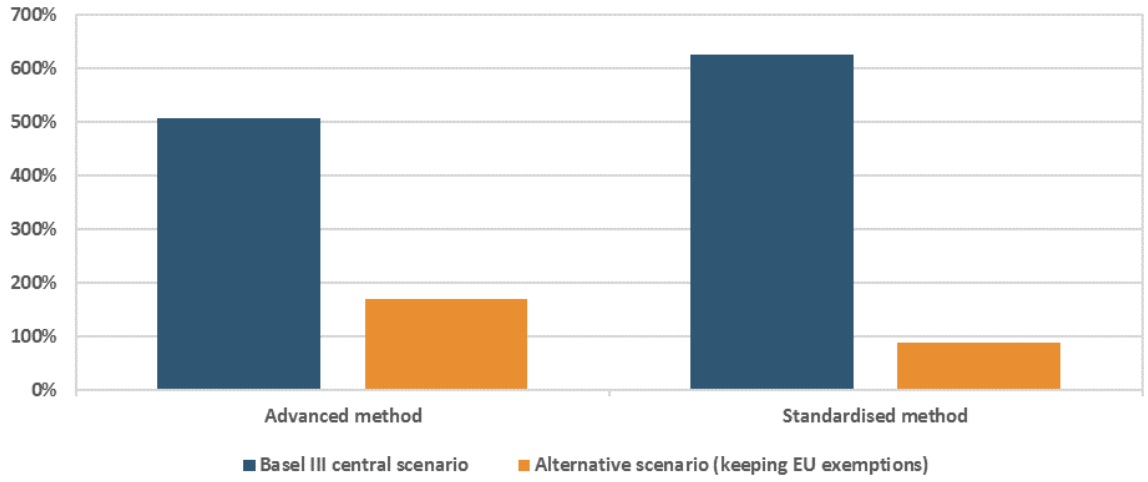
340. The total impact of the Basel III central scenario is the combined result of i) the revised methods to calculate CVA capital requirements, and ii) the changes in the scope of transactions subject to CVA capital requirements. To show the breakdown between these two changes, the alternative scenario shows the impact of the revised CVA methods only, assuming that the scope of transactions subject to CVA capital requirements remains unchanged relative to the current framework. Under the alternative scenario (orange bars), the impact is significantly lower, suggesting that the overall impact under the Basel III central scenario is primarily driven by the removal of EU exemptions. Specifically, the average impact falls to 132%, with smaller banks being affected the most (+226%), followed by large banks (+136%). On the other hand, medium-sized banks show a relatively small impact, 8%.

Figure 77 Percentage change in CVA RWA (relative to total current CVA RWA), by bank size



Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 105 banks: Large (68), of which G-SIIs (8), of which O-SIIs (38); Medium (32); Small (5).

Figure 78 Percentage change in CVA RWA (relative to total current CVA RWA), by current approach



Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 105 banks: Advanced method (11), Standardised method (93), Alternative approach (Art. 385 of the CRR)* (1).
* Not shown because fewer than three entities in the cluster.

Table 47 Distribution of percentage change in CVA RWA (relative to total current CVA RWA), Basel III central scenario, all banks

Percentile	Percentage
5th percentile	-84
25th percentile	0
Median	208
75th percentile	671
95th percentile	2588

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 105 banks.

9. Operational Risk

9.1 Impact of the overall reform

341. The reform of the operational risk framework replaces all currently existing approaches to the calculation of the operational risk capital requirement with a new risk sensitive standardised approach (BCBS SA). Among the currently existing approaches, the basic indicator approach (BIA) and the standardised approach (SA) are standardised approaches, whereas the advanced measurement approach (AMA) is an internal model-based approach. With the implementation of the new framework, the use of internal models for operational risk will no longer be allowed.

342. The BCBS SA determines regulatory capital on the basis of two components: the Business Indicator Component (BIC), which is a financial-statement-based proxy for operational risk, and, for larger institutions (bucket 2 and 3 institutions), the internal loss multiplier (ILM). The latter is a scaling factor based on the relationship between an indicator of the bank's average historical losses and the BIC itself. A bank with losses that are high relative to its BIC implements an ILM larger than 1, i.e. it is required to hold higher capital due to the incorporation of internal losses into the calculation methodology. Conversely, a bank with losses that are low relative to its BIC implements an ILM lower than 1, i.e. it is granted a capital relief reflecting its relatively benign loss history.

343. The final Basel III framework provides for several national discretions. The main discretions assessed from a quantitative perspective in this report are the following:

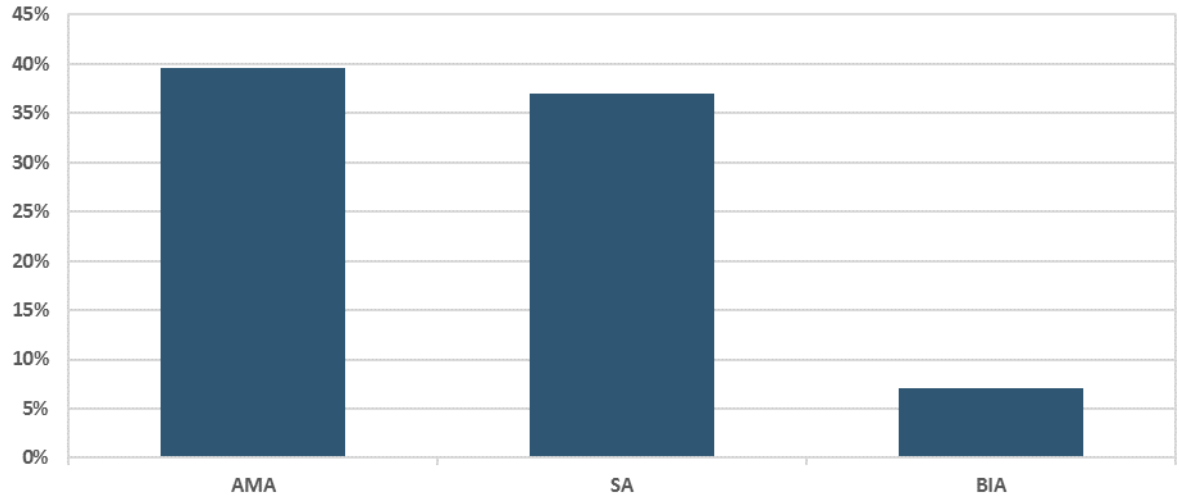
- supervisors may decide to set to 1 the ILM component for all bucket 2 and 3 institutions in a jurisdiction, neutralizing the role of historical losses in the calculation of the requirement;
- supervisors may decide to allow the use of the ILM also for bucket 1 institutions, on a case-by-case basis;
- supervisors may allow institutions to increase the minimum loss threshold determining inclusion of loss events in the calculation of the ILM from EUR 20 000 to EUR 100 000, on a case-by-case basis.

344. As described in Chapter 2, the central reform scenario assessed in relation to operational risk does not include any of the discretions allowed under the revised framework. The capital requirement is computed on the basis of the BIC for bucket 1 institutions and on the basis of both the BIC and the ILM for bucket 2 and 3 institutions. The minimum loss amount implemented within the central scenario is EUR 20 000.

345. On average, operational risk RWA in the sample increase by 37% (Figure 80).

346. The impact is heterogeneous between institutions that use different approaches in the current framework. Institutions that currently make use of the BIA experience the lowest impact (RWA increase by 7%), whereas for SA and AMA institutions the impact is more material (RWA increase by 37% and 40%, respectively).

Figure 79 Percentage change in operational risk RWA (relative to total current operational risk RWA), by type of approach adopted in current framework



Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 182 banks: AMA (23), SA (84), BIA (75).

347. The impact is also heterogeneous between institutions of different sizes, with large institutions (which represent 59% of the number of institutions in the operational risk sample) and G-SIIs driving the average result. Large institutions experience a 39% increase in operational risk RWA with respect to current levels. The average increase in RWA for G-SIIs is 48%, whereas medium institutions experience an immaterial increase and small institutions a 26% reduction in RWA. These impact results are not entirely surprising, as, in line with the design of the BCBS SA framework, institutions of higher BI buckets (i.e. larger institutions) apply higher regulatory coefficients in the calculation of the BIC.

348. In addition, institutions of different sizes tend to use different approaches in the current framework, which partly explains the different outcomes in terms of impact (see Annex 3 for more detail on the use of current approaches). In particular:

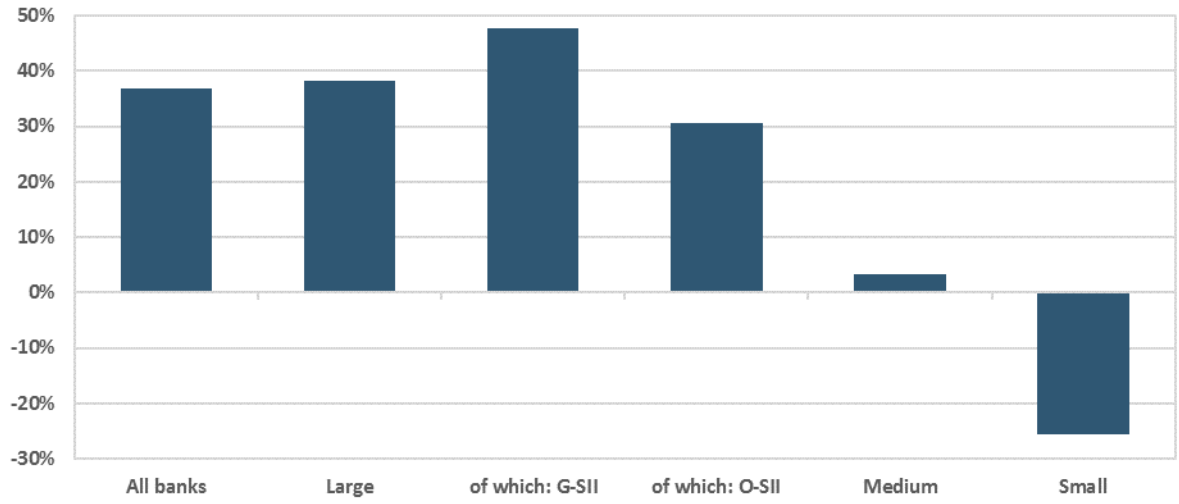
- Around half of the institutions classified as large use the SA method. One quarter of the institutions classified as large use the AMA. All but two G-SIIs use the AMA. As seen above, the SA and AMA approaches are the two most affected among the current approaches.

- A majority of medium-sized and small institutions (60% and 75%, respectively) use the BIA approach, which is instead far less affected by the introduction of the new framework.

349. Comparing the currently applicable BIA approach with the new BCBS SA framework applicable to small institutions, which are all BI bucket 1 institutions, helps to explain the decline in RWA among these institutions. The BCBS SA determines the capital requirement of bucket 1 institutions by multiplying the BIC by a fixed 12% coefficient. The currently applicable BIA determines capital as the product of the relevant indicator, which is a measure of business size not too different from the new BIC, and a fixed 15%.

350. The reform of the operational risk framework shows a positive impact of around 60% and a negative impact of around 40% on the institutions in the sample, whereas the impact is clustered at the upper and lower tails of this distributions (Table 48).

Figure 80 Percentage change in operational risk RWA (relative to total current operational risk RWA), by size



Sources: EBA 2018-Q2 QIS data and EBA calculations.
Notes: Based on a sample of 182 banks: Large (103), of which G-SII (8), of which O-SII (56), Medium (59), Small (20).

Table 48 Distribution of percentage change in operational risk RWA(relative to total current operational risk RWA), all banks

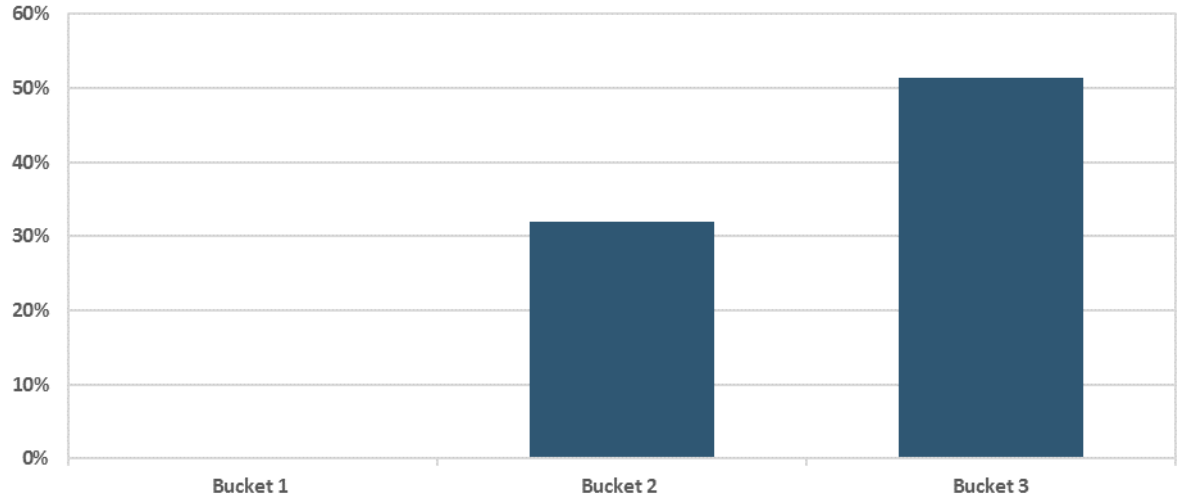
Percentile	Percentage
5th percentile	-30.71
25th percentile	-14.57
Median	2.38
75th percentile	29.76
95th percentile	86.04

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 182 banks

351. Also due to the construction of the BCBS SA formula, which applies higher coefficients to institutions falling into higher BI buckets, the reform has a disproportionately greater impact on institutions in BI buckets 2 and 3 disproprtionally more than bucket 1 institutions. As a result, while the changes in operational risk RWA are approximately 30% and 50%, respectively, for bucket 2 and bucket 3 institutions, the change in RWA is close to zero for bucket 1 institutions (Figure 81).

352. All five bucket 3 institutions are G-SII institutions (the three remaining G-SII institutions being in bucket 2). It should be kept in mind that the classification of institutions into buckets differs from the classification based on size and complexity, and should not be taken as a proxy of the latter.

Figure 81 Percentage change in operational risk RWA (relative to total current operational risk RWA), by bucket



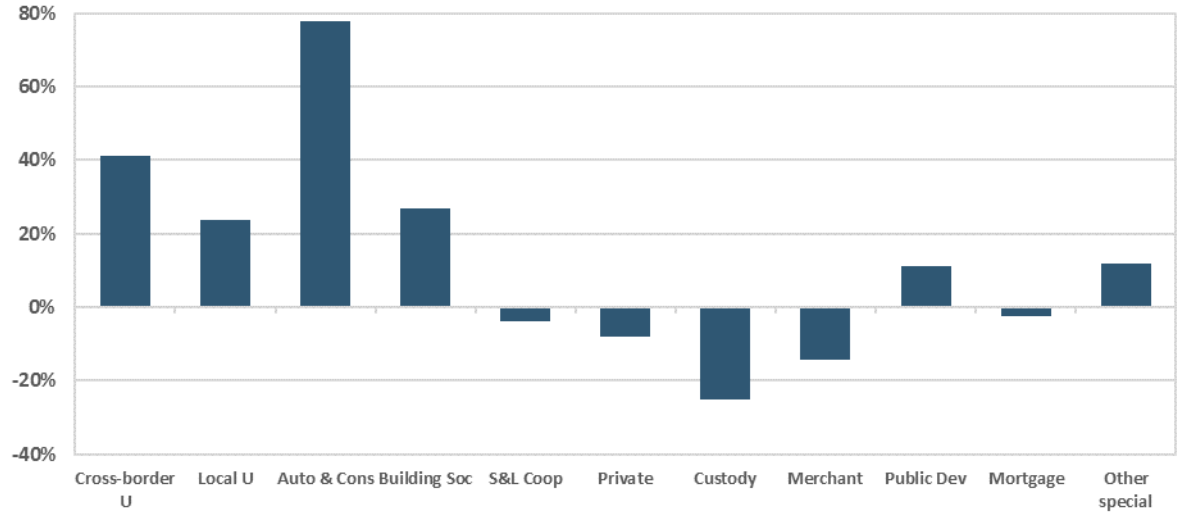
Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 182 banks: Bucket 1 (114),Bucket 2 (63), Bucket 3 (5).

353. The new operational risk framework tends to have a different impacts on different business models:

- The auto and consumer credit business model is the business model that shows the largest impact, with operational risk RWA increasing by around 80%. This is followed by the cross-border universal business model, for which the increase in RWA is around 40%, and the local universal and building society business models, whose RWA increase by between 20% and 30%.

- Most of the business models that in the current framework mostly rely on the BIA method experience a decrease in RWA (Leasing, Custody, Private, Mortgage, S&L Coop). Notable exceptions are building societies and public development banks, for which the RWA increase on average.

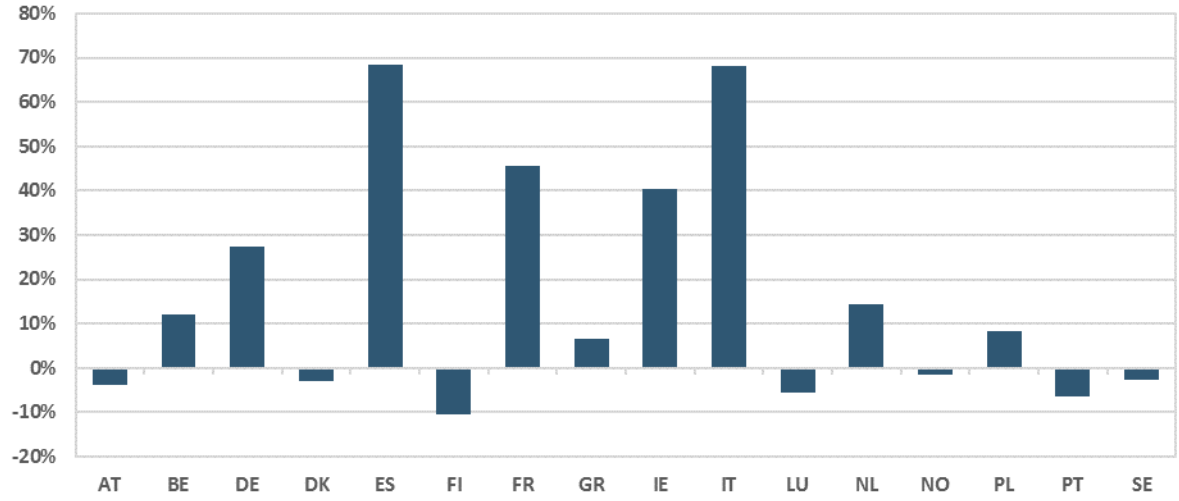
Figure 82 Percentage change in operational risk RWA (relative to total current operational risk RWA), by business model



Sources: EBA 2018-Q2 QIS data and EBA calculations.
Notes: Based on a sample of 193 banks: Cross-border U (41), Local U (61), Building Soc (5), Private (4), Merchant (5), Leasing* (1), Public Dev (10), Mortgage (7), Other special (12), Local U (17), Auto & Cons (8), S&L Coop (32), Custody (7).
* Not shown in the chart because fewer than three entities in the cluster.

354. The impact of the revised framework also differs between countries (Figure 82). Most jurisdictions experiencing an average decrease in operational risk RWA are those where the institutions at present predominantly use the BIA method (the exceptions are PT and SE). The choice of approaches in the current framework is more heterogeneous in the four most affected jurisdictions (ES, IT, FR, IE).

Figure 83 Percentage change in operational risk RWA (relative to total current operational risk RWA), by country



Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 193 banks: AT (15), BE (4), DE (38), DK (7), ES (11), FI (5), FR (14), GR (5), HR* (2), HU* (1), IE (11), IT (24), LU (6), LV* (1), MT* (1), NL (11), NO (7), PL (11), PT (8), SE (11).
* Not shown in the chart because fewer than three entities in the cluster.

9.2 Individual reforms and scenario analysis

9.2.1 Decomposing the impact of the BCBS SA reform

355. The new BCBS SA framework for operational risk replaces all existing approaches to the calculation of the operational risk capital requirement. Notably, the reform eliminates the use of the AMA, which is the only current approach based on institutions' internal models.

356. In order to shed more light on the impact of the operational risk reform, particularly on AMA institutions, it is useful to decompose the overall policy change into three different measurements, as follows:

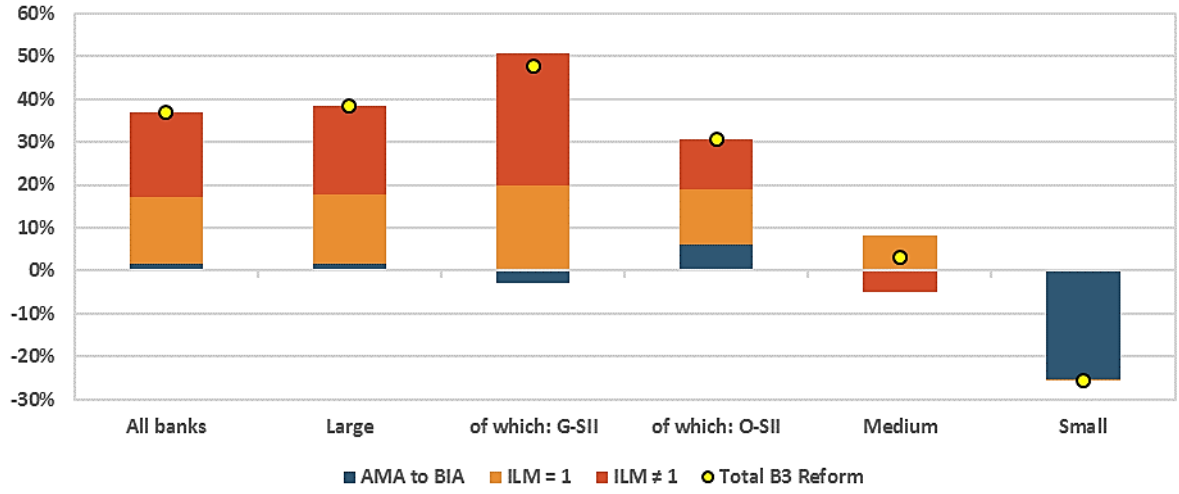
- step 1 (removal of AMA): shift from the current AMA to the current BIA for AMA institutions only;
- step 2: shift from the current BIA or SA (BIA for AMA institutions) to the new BCBS SA framework with an ILM set to 1 (inactive loss component);
- step 3: shift to a BCBS SA framework with bank-specific ILM (active loss component) for BI bucket 2 and 3 institutions.

357. Step 1 singles out the capital impact of dismissing internal models from the current framework and affects only current AMA institutions. Steps 2 and 3 show the capital impact of shifting from the use of the current standardised approaches for all institutions in the sample (including AMA institutions, to which the BIA is assigned as an intermediary step) to the new BCBS SA, in a first instance with an inactive ILM factor (set to 1) and subsequently with an active ILM factor (bank-specific).

358. Removing the AMA from the regulatory framework, i.e. step 1 above, has the following impact (Figure 84):

- It contributes 1.5 percentage points to the EU-average 37% increase in operational risk RWA resulting from the implementation of the new framework.
- It contributes 1.6 percentage points to the average 40% increase in operational risk RWA for large institutions. For G-SIIs the impact is negative (3%) showing that on average they use a more conservative approach, while, for the O-SIIs, moving from AMA to BIA implies an increase of MRC (6%).
- It has no impact on medium-sized institutions, while the negative impact on small institutions is mainly driven by one bank.

Figure 84 Percentage change in operational risk RWA (relative to total current operational risk RWA), by three steps of the reform and size

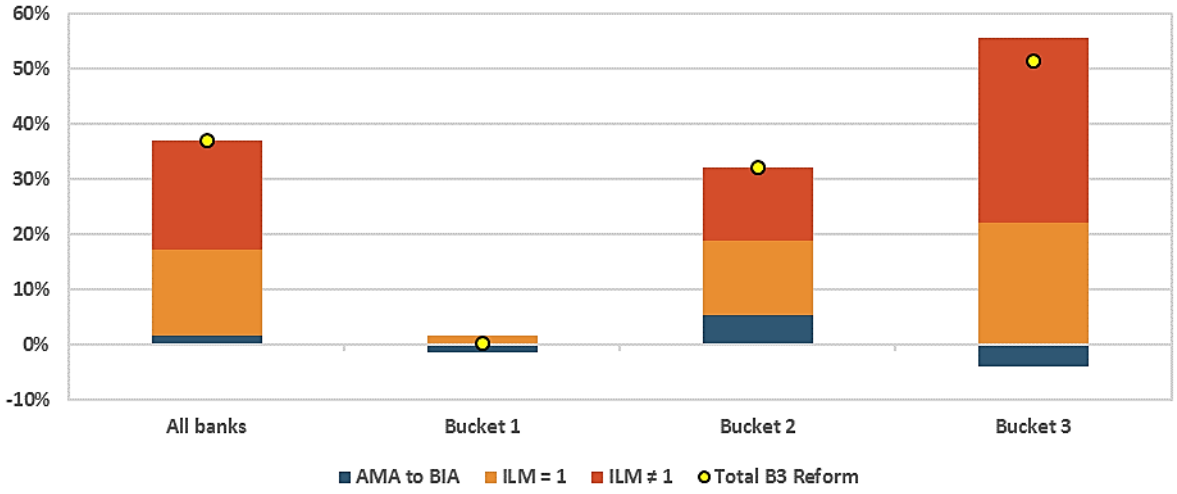


Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 182 banks: AMA (23), SA (84), BIA (75).

359. When clustering institutions with respect to their BI bucket (Figure 85), disallowing the internal models has the following impacts:

- operational risk RWA for bucket 1 institutions decline, on average (driven by the only AMA institution of the BI bucket 1 group);
- there is a non-negligible average increase in RWA for bucket 2 institutions (the bucket in which most AMA institutions are represented);
- there is a non-negligible decline in RWA for bucket 3 institutions (all institutions of the bucket 3 type are G-SIIs, a majority of which currently adopt the AMA).

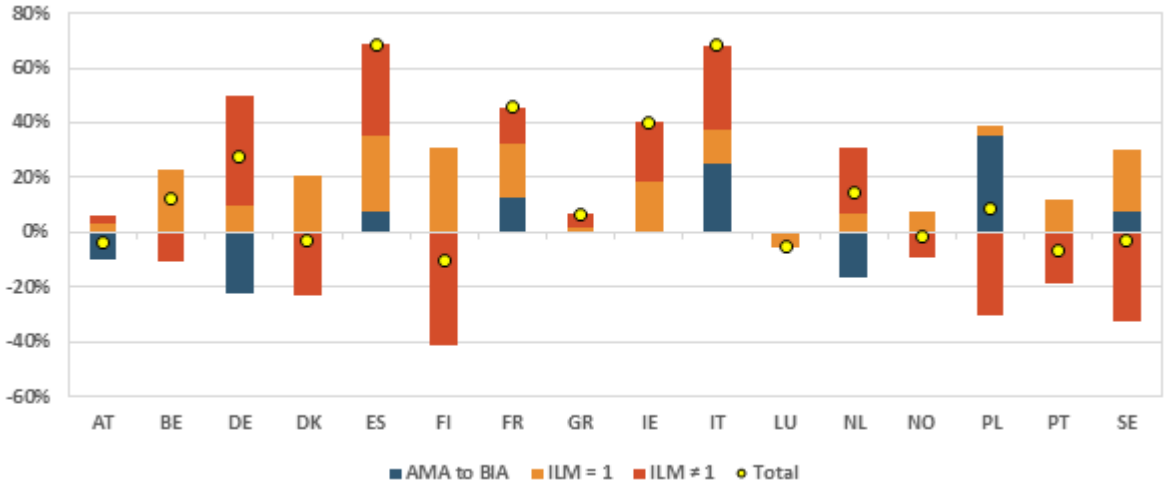
Figure 85 Percentage change in operational risk RWA (relative to total current operational risk RWA), by three steps of the reform and bucket



Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 182 banks: Bucket 1 (114), Bucket 2 (63), Bucket 3 (5).

360. The removal of the AMA framework has different impacts across jurisdictions (Figure 86). In a very limited number of cases it is the component of the operational risk reform that dominates the impact at the country level.

Figure 86 Percentage change in operational risk RWA (relative to total current operational risk RWA), isolating the impact of removing AMA, by country



Sources: EBA 2018-Q2 QIS data and EBA calculations.
Notes: Based on a sample of 193 banks: AT (15), BE (4), DE (38), DK (7), ES (11), FI (5), FR (14), GR (5), HR* (2), HU* (1), IE (11), IT (24), LU (6), LV* (1), MT* (1), NL (11), NO (7), PL (11), PT (8), SE (11).
* Not shown in the chart because fewer than three entities in the cluster.

9.2.2 ILM discretion: ILM=1 for bucket 2 and 3 institutions

361. The revised Basel III standards provide that supervisors may at their discretion choose not to apply the loss component of the requirement for institutions in buckets 2 and 3, by setting the ILM to 1 for these institutions. When the ILM is set to 1, the bank's operational risk capital requirement is exclusively determined on the basis of the BIC.

Table 49 Scenario specification – ILM=1 for bucket 2 and 3 institutions

Scenario	Description
Central Basel III scenario	ILM: bank-specific for institutions within BI bucket 2 and bucket 3 ILM=1 for institutions within BI bucket 1 Loss threshold in ILM: EUR 20 000
ILM = 1	ILM=1 for all institutions Loss threshold in ILM: EUR 20 000

362. Exercising this discretion would more than halve the average change in operational risk RWA for the EU sample, from around 37% to around 17% (Figure 87).

363. The discretion would substantially mitigate the impact of the new framework for G-SIIs and large institutions, and to a lesser extent for O-SIIs. Medium sized institutions would see their requirements increase on average if the discretion were exercised. No change in impact would arise for small institutions, as all of these institutions belong to BI bucket 1, to which, by construction, the BCBS SA applies an ILM equal to 1.

364. In comparing the two policy scenarios, it should be kept in mind that, given that the ILM is a multiplicative factor, setting it to 1 has the following implications relative to the central scenario:

- the capital charge of institutions with a reported ILM larger than 1, i.e. those with a worse historical loss experience, decreases;
- the capital charge of institutions with a reported ILM smaller than 1, i.e. those with a better historical loss experience, increases.

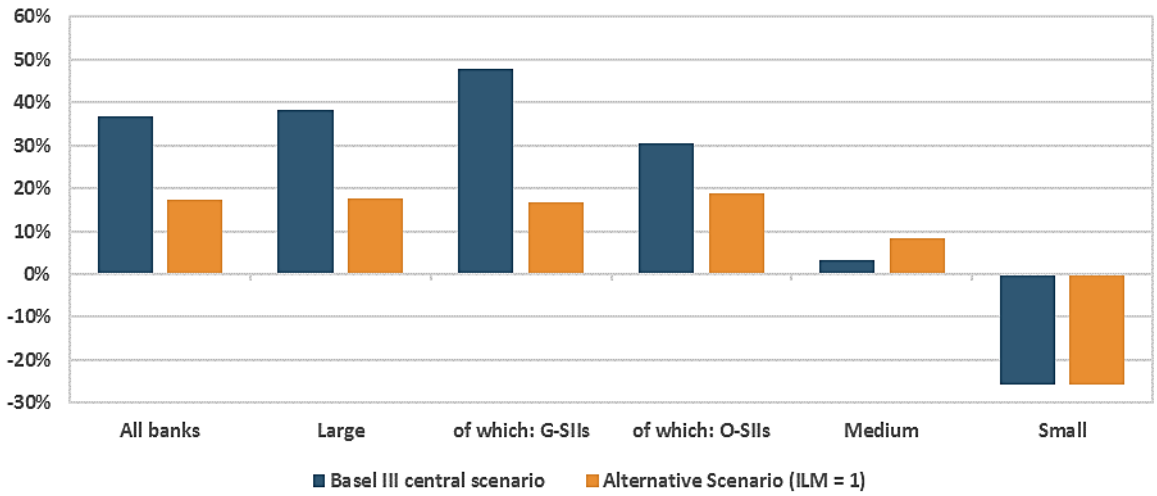
365. As regards the role of the ILM for institutions in BI bucket 2 and bucket 3, the following should be considered:

- Among large institutions, as well as among O-SIIs, the institutions are broadly evenly split between those reporting an ILM larger than 1 and those reporting an ILM smaller than 1.
- Six out of eight G-SIIs report an ILM larger than 1, hence the very material difference in impact across the two scenarios, on average, for this type of institution.

- There are very few medium-sized institutions that are large enough to fall into BI bucket 2 or 3, and all of them report an ILM lower than 1. This explains why medium institutions would incur a higher impact from the operational risk reform if the ILM=1 discretion were to be exercised.

- As noted above, small institutions are all BI bucket 1 institutions, so their ILM is set to 1 under both scenarios.

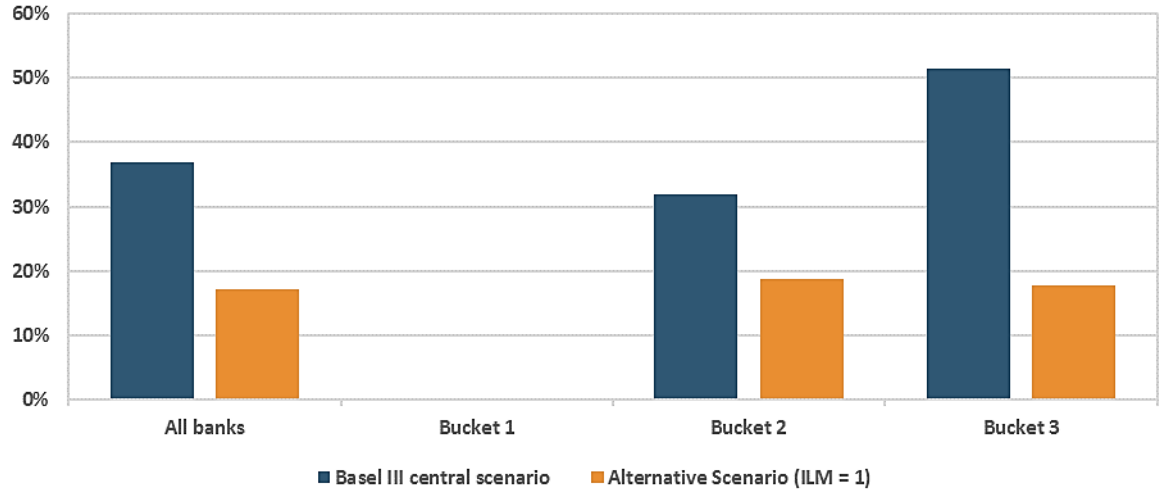
Figure 87 Percentage change in operational risk RWA, (relative to total current operational risk RWA), by scenario and bank size



Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 182 banks: Large (103), of which G-SII (8), of which O-SII (56); Medium (59); Small (20).

366. The difference in impact between scenarios is particularly pronounced for institutions falling into bucket 3, which are all G-SIIs and, as mentioned above, mostly report an ILM larger than 1 (Figure 88). Under the exercise of the discretion, institutions in buckets 2 and 3 would experience a similar increase in operational risk RWA (slightly below 20%).

Figure 88 Percentage change in operational risk RWA, (relative to total current operational risk RWA), by scenario and bucket



Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 182 banks: Bucket 1 (114), Bucket 2 (63), Bucket 3 (5).

367. As regards the impact of the ILM discretion across business models, it should be noted that such discretion would almost exclusively affect the cross-border universal banks and the Local universal banks, as a vast majority of institutions in buckets 2 and 3 belong to these business models. In particular, the ILM discretion would:

- more than halve the operational risk RWA increase for cross-border universal banks
- only slightly reduce the operational risk RWA increase for local universal banks

368. For business models other than the universal model (subject to the caveat on the sample size as mentioned above), setting ILM to 1 for bucket 2 and 3 institutions would:

- reduce materially the average increase in operational risk RWA for automotive and consumer credit banks (due to only one bucket 2 institution within this business model);
- lead to an increase in operational risk RWA, rather than a decrease under the central scenario, for the private bank business model and the mortgage business model (due to only one bucket 2 institution within each business model);
- Amplify materially the increase in operational risk RWA for the specialised bank business model

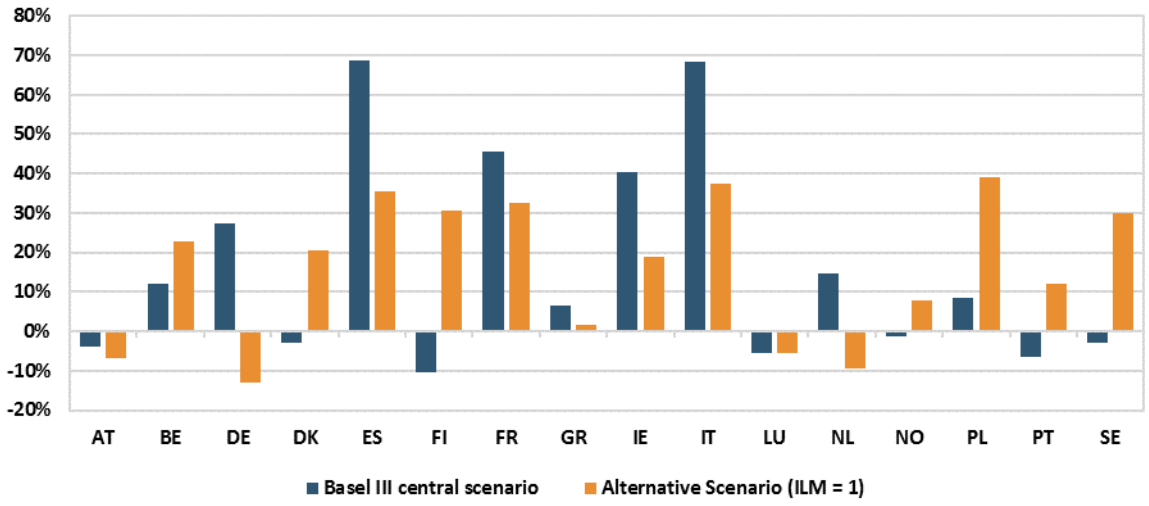
369. The impact of the discretion appears very heterogeneous between jurisdictions in the EU (Figure 89). In particular, the discretion under consideration would:

- change the direction of impact of the reform, from a decrease in RWA to an increase in RWA (in some cases material) in all those jurisdictions where all institutions falling in bucket 2 or 3 have a reported ILM lower than 1 (DK, FI, NO, PT, SE);

- materially amplify the increase in RWA in BE, where all institutions of bucket 2 or 3 have a reported ILM lower than 1;

- dampen the increase in RWA or cause a decrease in RWA in those countries where a majority of bucket 2 and 3 institutions have a reported ILM larger than 1 (AT, DE, ES, GR, HU, IE, IT, NL) or where those institutions with an ILM larger than 1 are materially affected by the ILM (FR).

Figure 89 Percentage change in operational risk RWA, (relative to total current operational risk RWA) by scenario and country



Sources: EBA 2018-Q2 QIS data and EBA calculations.
Notes: Based on a sample of 193 banks: AT (15), BE (4), DE (38), DK (7), ES (11), FI (5), FR (14), GR (5), HR* (2), HU* (1), IE (11), IT (24), LU (6), LV* (1), MT* (1), NL (11), NO (7), PL (11), PT (8), SE (11).
* Not shown in the chart because fewer than three entities in the cluster.

9.2.3 ILM discretion: allowing the use of the ILM to bucket 1 institutions

370. The BCBS SA does not envisage application of the historical loss component of the requirement (ILM) for institutions of bucket 1. However, the revised standards provide that at discretion jurisdictions may allow bucket 1 institutions to apply the ILM in the calculation of the capital requirement on a case-by-case basis, provided that the ILM is also bank-specific for institutions of buckets 2 and 3.

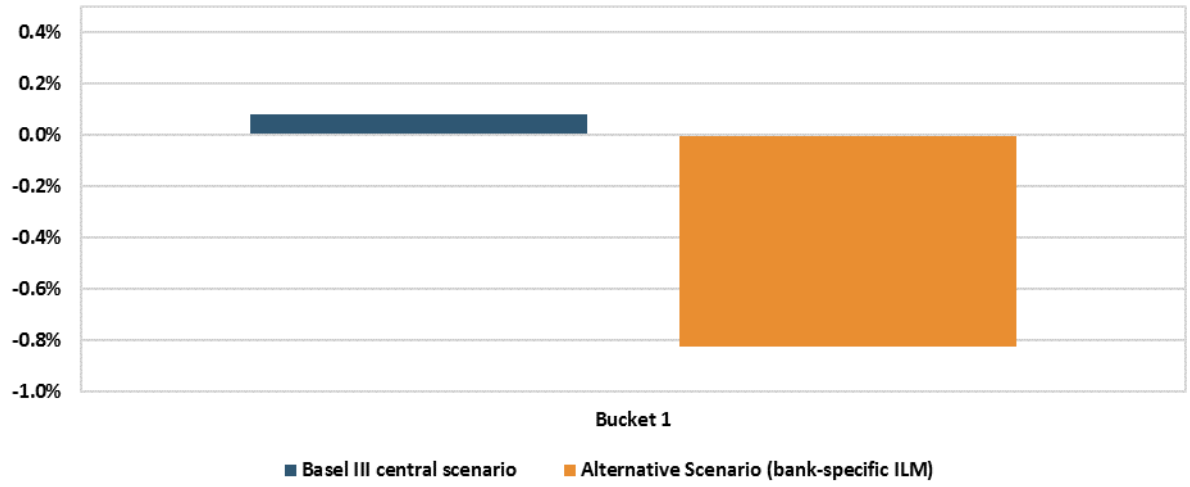
371. Disregarding the case-by-case nature of the policy framework, for simplicity reasons, the analysis in this section assumes that all bucket 1 institutions choose to use a bank-specific ILM in the calculation of capital (Table 50). The maximum impact that such a discretionary framework may have within the European sample is then calculated. If all bucket 1 institutions applied for such discretion, the impact of the operational risk reform for these institutions would change only slightly, from a negligible increase in operational risk RWA to a decrease of around 1% (Figure 90).

Table 50 Scenario specification: use of ILM by bucket 1 institutions

Scenario	Description
Central Basel III scenario	ILM: Bank-specific for institutions within Business Indicator Bucket 2 and Bucket 3 ILM =1 for institutions within Bucket 1 Loss threshold in ILM: EUR 20,000
Discretion: ILM on Bucket 1 (ILM all banks)	ILM: Bank-specific for institutions within Business Indicator Bucket 1, Bucket 2 and Bucket 3 Loss threshold in ILM: EUR 20,000

372. The more benign impact under the bank-specific ILM scenario is because most BI bucket 1 institutions (about 70% of them) report an ILM lower than 1, i.e. they have a better than average historical loss experience.

Figure 90 Percentage change in operational risk RWA, (relative to total current operational risk RWA), by scenario

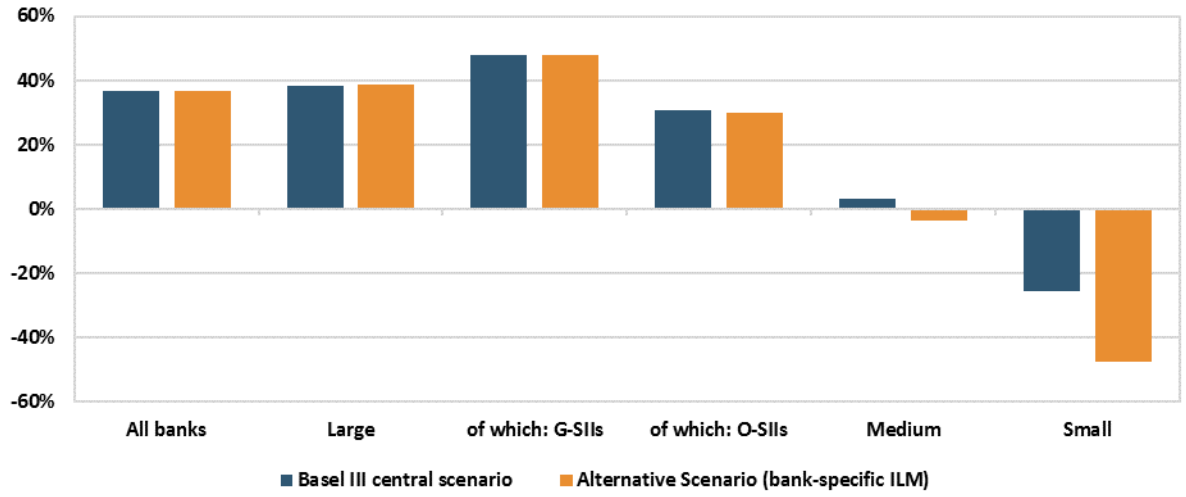


Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 114 banks.

373. Allowing bucket 1 institutions to use a bank-specific ILM does not meaningfully affect the EU average change in operational risk RWA (Figure 91), as most bucket 1 institutions are medium-sized or small institutions and their weight within the overall sample is low.

374. The impact of the reform changes more materially for medium-sized and small institutions if a bank-specific ILM factor is applied to bucket 1 institutions. For medium institutions, operational risk RWA would slightly decrease instead of slightly increasing, whereas for small institutions the change in operational risk RWA would go from about -25% to about -47%.

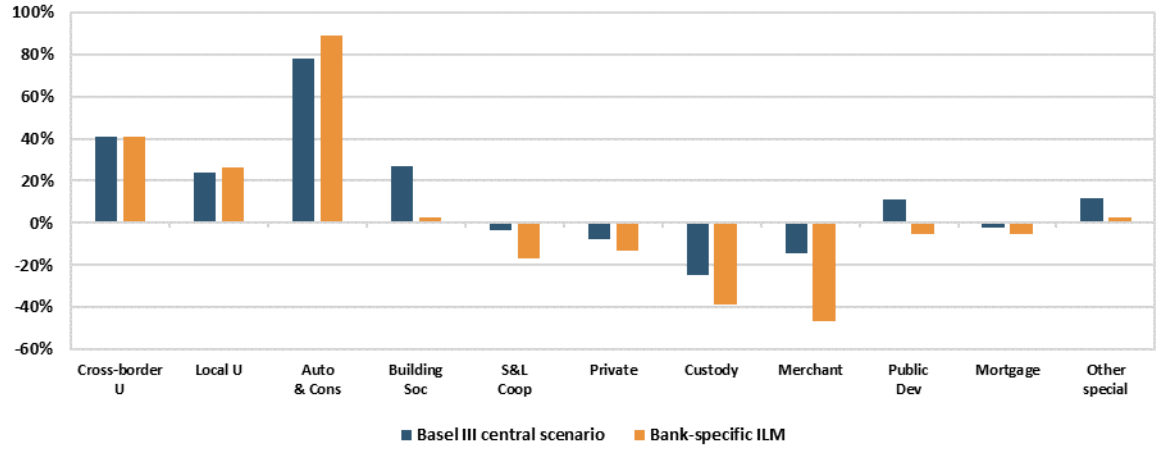
Figure 91 Percentage change in operational risk RWA, (relative to total current operational risk RWA), by scenario and bank size



Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 182 banks: Large (103), of which G-SII (8), of which O-SII (56); Medium (59); Small (20).

375. The discretion would have a negligible impact on the universal business model, be it of the cross-border or local type, as the universal business model is dominated by institutions in buckets 2 and 3, which are not in the scope of the discretion under consideration. Other business models appear to be meaningfully affected by the discretion to implement the ILM on bucket 1 institutions, as bucket 1 institutions are more frequently associated with specialised business models in the sample (Figure 92).

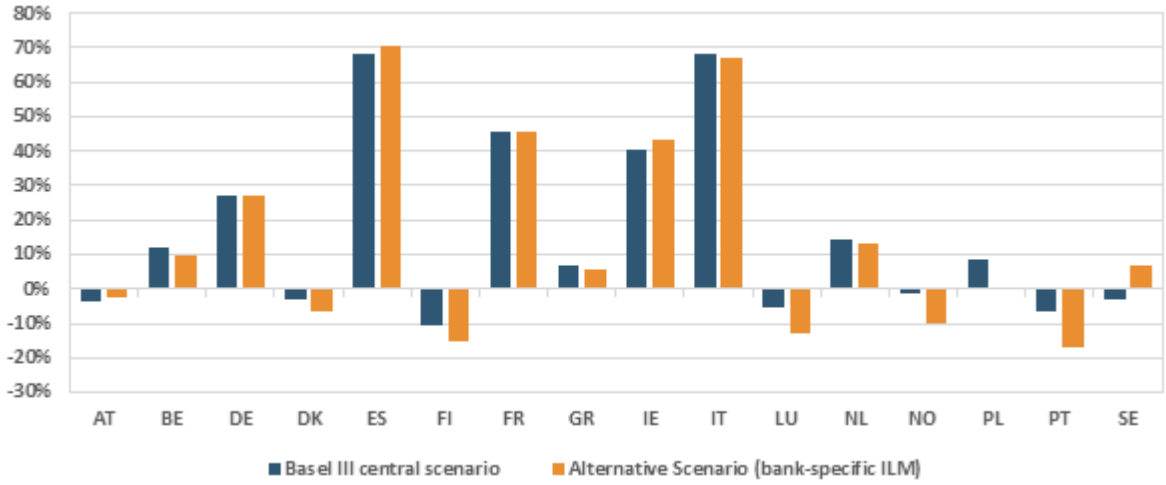
Figure 92 Percentage change in operational risk RWA (relative to total current operational risk RWA), by scenario and business model



Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 193 banks: Cross-border U (41), Local U (61), Building Soc (5), Private (4), Merchant (5), Leasing* (1), Public Dev (10), Mortgage (7), Other special (12), Local U (17), Auto & Cons (8), S&L Coop (32), Custody (7).
* Not shown in the chart because fewer than three entities in the cluster.

376. Exercising the discretion under consideration only has a sizeable impact on the average operational risk RWA impact in some jurisdictions, where the national sample is dominated by bucket 1 institutions (FI, LU, NO, PL, PT, SE) (Figure 93). With the exception of SE, all the jurisdictions where the discretion has a sizeable average impact would benefit from the implementation of the discretion, mostly due to bucket 1 institutions reporting an ILM factor lower than 1.

Figure 93 Percentage change in operational risk RWA, (relative to total current operational risk RWA), by scenario and country



Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 193 banks: AT (15), BE (4), DE (38), DK (7), ES (11), FI (5), FR (14), GR (5), HR* (2), HU* (1), IE (11), IT (24), LU (6), LV* (1), MT* (1), NL (11), NO (7), PL (11), PT (8), SE (11).
* Not shown in the chart because fewer than 3 entities in the cluster.

9.2.4 ILM discretion: the minimum loss threshold

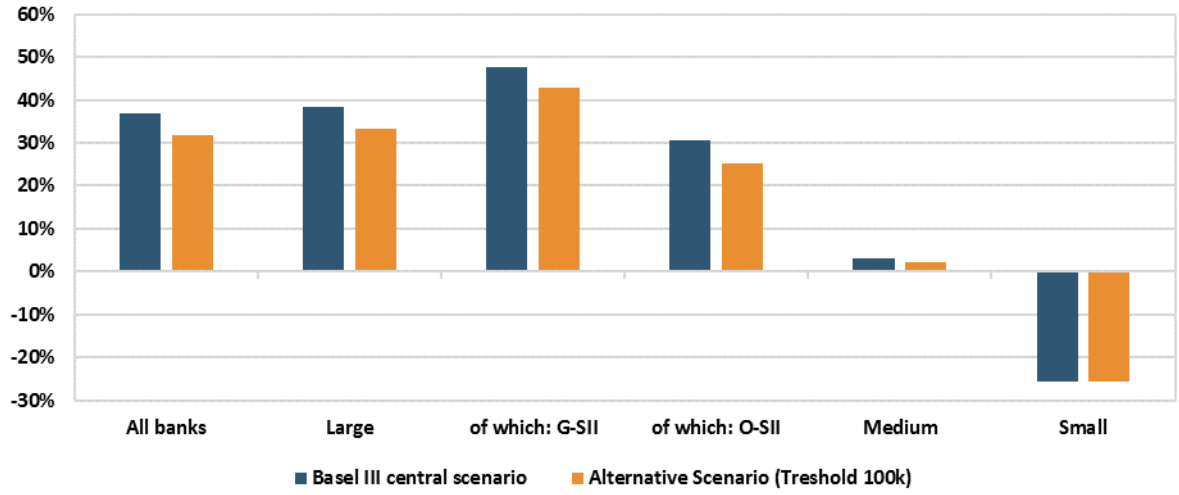
377. The new BCBS SA provides the discretion to allow institutions to apply a minimum loss threshold of EUR 100 000 instead of EUR 20 000 in the calculation of the ILM component for bucket 2 and bucket 3 banks. Disregarding the case-by-case nature of the discretionary framework, for simplicity reasons, the analysis in this section assumes that all institutions of BI buckets 2 and 3 applied to use a higher minimum loss threshold, and hence estimates what could be the maximum impact of the policy under consideration.

Table 51 Scenario specification: minimum loss threshold

Scenario	Description
Basel III central scenario	ILM: bank-specific for institutions within Business Indicator bucket 2 and bucket 3 ILM=1 for institutions within bucket 1 Loss threshold in ILM: EUR 20 000
Losses> €100K	ILM: bank-specific for institutions within Business Indicator bucket 2 and bucket 3 ILM=1 for institutions within bucket 1 Loss threshold in ILM: EUR 100 000

378. Exercising the discretion on the minimum loss threshold would dampen the average impact of the operational risk reform from around a 37% increase in RWA to an increase of 32% (Figure 94). The discretion under consideration would not change the impact for small institutions, as all small institutions fall into the bucket 1 and therefore are not in the scope of the discretion under consideration (i.e. in both scenarios bucket 1 institutions do not apply the ILM and hence are not affected by different ways of computing that factor).

Figure 94 Percentage change in operational risk RWA (relative to total current operational risk RWA), by scenario and bank size

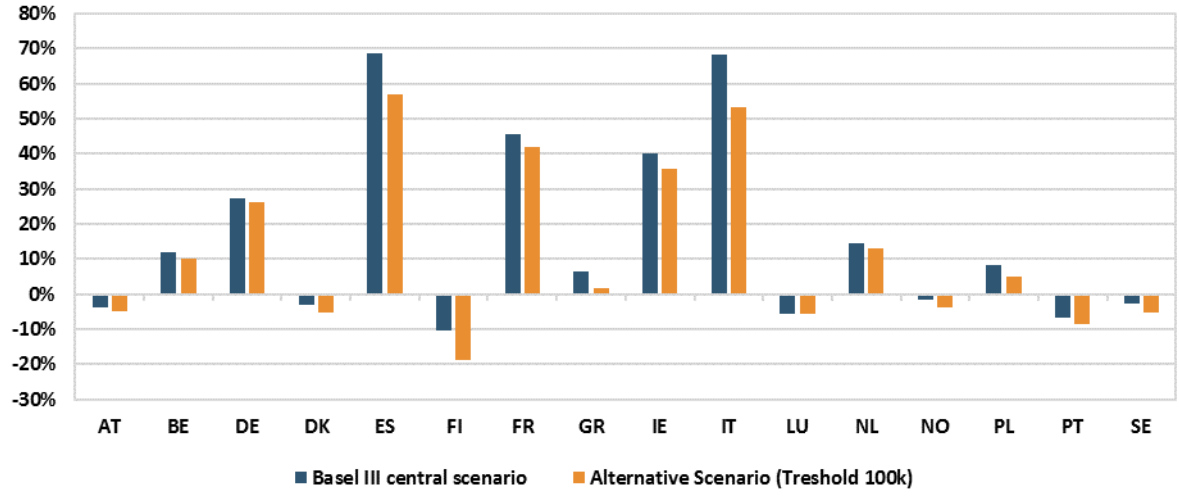


Sources: EBA 2018-Q2 QIS data and EBA calculations.
Notes: Based on a sample of 182 banks: Large (103), of which G-SII (8), of which O-SII (56); Medium (59); Small (20).

379. The impact of adopting a higher minimum loss threshold is sensible for only certain business models, including local universal, automotive and consumer credit, private and custody. For all these business models, the adoption of a higher minimum loss threshold would dampen the impact of the reform in terms of operational risk RWA.

380. For certain jurisdictions, the choice of the minimum loss threshold changes the average impact of the reform on operational risk RWA (Figure 95).

Figure 95 Percentage change in operational risk RWA (relative to total current operational risk RWA), by scenario and country



Sources: EBA 2018-Q2 QIS data and EBA calculations.
Notes: Based on a sample of 193 banks: AT (15), BE (4), DE (38), DK (7), ES (11), FI (5), FR (14), GR (5), HR* (2), HU* (1), IE (11), IT (24), LU (6), LV* (1), MT* (1), NL (11), NO (7), PL (11), PT (8), SE (11).
* Not shown in the chart due to less than 3 entities in the cluster.

9.3 Implementation and policy recommendations

IMPORTANT NOTE: This section includes only those policy recommendations on operational risk that are linked to the quantitative impact assessment illustrated in this report. Additional recommendations on the operational risk framework, and more detailed policy rationale, can be found in the EBA Report "Policy advice on the Basel III reforms: operational risk"accompanying this publication. **The numbering of the recommendations in this section is aligned with the numbering used in that accompanying report.**

9.3.1 ILM discretion: ILM=1 for bucket 2 and 3 institutions

381. As shown in the Section 9.2.2, the application of ILM = 1 to institutions of buckets 2 and 3 is expected to lower the average impact of the operational risk reform in a sensible way for large and systemically important institutions. In different jurisdictions the exercise of such discretion leads to different outcomes, with some countries experiencing a materially lower average impact of the operational risk reform and others seeing operational risk RWA increase.

382. Taking into account the material impact of the policy discretion under consideration in terms of regulatory capital levels, additional considerations should be made to inform the policy decision.

383. First, it should be considered that historical losses can usefully predict the exposure to operational risk and hence future operational risk losses. As described in the EBA Report 'Policy advice on the Basel III reforms: operational risk', econometric and statistical evidence on the EU sample shows that past operational losses play a role in predicting future operational risk losses.

384. Second, as described in in the EBA Report 'Policy advice on the Basel III reforms: operational risk', it is important to note that the use of a bank-specific ILM improves the performance of the new operational risk capital framework in covering actual historical losses.

385. Furthermore, responding to one of the criticisms raised by stakeholders during the consultation phase regarding the time volatility implications of using historical losses in the determination of the capital requirement, data on the QIS sample were used to show that the use of the ILM for bucket 2 and 3 institutions is not the major driver of volatility of the revised operational risk capital requirement (see EBA Report 'Policy advice on the Basel III reforms: operational risk').

386. It also appears important to consider the implications of using historical losses in the determination of capital requirements on banks' incentives. The inclusion of the loss component is expected to:

i. ensure an immediate link between the losses and the risk profile, incentivising banks to take action in order to prevent losses;

ii. improve banks' incentives to collect and report high quality data, improving data collection processes overall and also facilitating the implementation of the more qualitative requirements of the new framework (see EBA recommendations).

387. Finally, the inclusion of the loss component is expected to facilitate the ICAAP process as it would create synergies between Pillar 1 and Pillar 2 operational risk processes (since loss data would be used in both cases) (see EBA recommendations).

Recommendation OR 2 on the discretion on bank-specific ILM or ILM = 1

In the light of the analysis of the drivers of setting ILM equal to 1, the statistical analyses on the use of losses in capital calculation and the additional policy considerations the EBA recommends that, in the adoption of the BCBS SA in the EU, the discretion to set ILM equal to 1 be not applied.

9.3.2 ILM discretion: allowing the use of the ILM to bucket 1 institutions

388. As shown in section 8.2.3, the use of a bank-specific ILM in the calculation of the requirement would lower, on average, operational risk RWA for institutions of BI bucket 1.

389. On the one hand, this shows that most BI bucket 1 institutions have a relatively benign loss history, as measured by an ILM lower than 1. On the other hand, the following elements should be taken into account:

- Bucket 1 institutions tend to be small institutions and, unlike large institutions, tend to experience a significant proportion of operational loss events below the minimum EUR 20 000 threshold that determines the inclusion of losses in the ILM calculation. The ILM is hence lower than 1 for these institutions due to fewer loss events being eligible for inclusion in the calculation of the requirement.

- Based on past experience on the collection of data on operational losses, data quality for small institutions tends to be lower than for medium-sized and large institutions. In this sense, the measured ILM may poorly represent the historical loss experience of smaller institutions.

390. Against this backdrop, permitting bucket 1 institutions to use a bank-specific ILM presents pros and cons and should be carefully framed.

391. On the one hand, only those bucket 1 institutions that have an ILM lower than 1 would have an incentive to request permission to use it, leaving room for regulatory capital arbitrage in the system. In addition, poor data quality on operational losses which tends to characterise smaller institutions may lead to inappropriately low levels of operational risk regulatory capital in the system. Furthermore, the envisaged system of qualitative thresholds in the operational risk framework would have to be reviewed if the permission were granted.

392. Against these arguments, it should be considered that linking the operational risk requirement of BI bucket 1 institutions to historical losses would increase the risk sensitivity of the requirement for small institutions that appropriately collect loss data, establishing a stronger link between risk management incentives and regulatory capital. The BI bucket 2 threshold of EUR 1 billion can be too high for certain small institutions with solid loss data collection and risk management processes. The threshold is such that certain SIs or LSIs that are relevant at national level may be excluded from the historical loss data collection framework as a result of being classified as institutions of bucket 1.

Recommendation OR 4 on the discretion for competent authorities to allow the use of bank-specific ILM for bucket 1 banks

In order to address with sufficient flexibility certain situations that could occur, competent authorities should retain the discretion to grant permission to the relevant bucket 1 institutions under their supervision to use a bank-specific ILM in the BCBS SA calculation. If this permission is granted, that bank should fulfil — as is the case for bucket 2 and 3 institutions — the quantitative and qualitative requirement envisaged by the BCBS SA baseline and the qualitative requirements indicated in Part 2 of the EBA Report 'Policy advice on the Basel III reforms: operational risk'.

Recommendation OR 5 on the criteria for allowing the use of bank-specific ILM for bucket 1 banks

The regulation should mandate the EBA to develop draft regulatory technical standards (RTS) specifying the criteria according to which the competent authorities can use this discretion. Once the permission is granted, only under extraordinary circumstances should it be revoked within 5 years. Equally, after the permission is revoked, a second permission should not be re-granted before another 5 years have passed.

9.3.4 ILM discretion: the minimum loss threshold

393. As shown in the previous sections, increasing the threshold changes the average impact of the operational risk reform in the EU only mildly (from +37% in the baseline BCBS SA to +32%). A limited number of Member States observe more marked reductions.

394. Given the evidence of a limited capital impact, when deciding whether to allow the use of a higher minimum loss threshold (EUR 100 000) important prudential pros and cons should be considered.

395. On the one hand, increasing the minimum loss threshold makes it possible:

a) to focus the calculation of the capital requirement on materially high loss events and tail risk loss events, which are the core of the unexpected loss component addressed by capital requirements;

b) not to unduly penalize institutions whose operational risk profile is characterised by high-frequency and low-severity loss events, which are already duly covered in pricing policies and cost management.

396. On the other hand, increasing the minimum loss threshold might present some drawbacks:

a) it might disincentivise banks to carry out good quality data management in relation to losses lower than EUR 100 000;

b) the lack of an immediate link between medium-sized losses and capital requirements might no longer encourage banks to implement provisions to avoid these operational losses;

c) the current loss data collection framework, based on Basel II, implies that the 'standard' threshold is in general EUR 10 000[78], so a EUR 20 000 threshold would already be an increase;

d) the focus on losses above EUR 100 000 might increase the volatility of the ILM for these banks, as it would focus the loss component on types of losses, that are less recurrent.

[78] See in Basel II standard, page 158, "bank must have an appropriate de minimis gross loss threshold for internal loss data collection, for example €10,000".

Recommendation OR 6 on the net aggregated value of a loss event
In order for a loss event to be included in the loss dataset, the net aggregated value of this event should be larger than the set threshold. The net aggregated value of an event is obtained by adding together its accounting impacts from the relevant years within the observation period, including the negative ones, namely release of provisions and recoveries. When this net aggregated value of an event is larger than the set threshold, all the impacts that are smaller than the threshold from particular years within the observation period (including negative figures stemming from releases/recoveries of losses) should still be included in the total amount of this event and reported consistently.

Recommendation OR 7 on the level of the loss data threshold
In the adoption of the BCBS SA, the loss data threshold for bucket 2 and bucket 3 banks as well as bucket 1 banks that obtain permission to include loss data (i.e. a bank-specific ILM) in the BCBS SA calculation should be set to EUR 20 000.

Recommendation OR 8 on the permission to use a higher loss data threshold
There may be banks in which the loss data threshold at EUR 100 000 better reflects their risk profile; in such cases, supervisors should retain the discretion to increase the threshold to EUR 100 000 if they deem it better suited to the risk profile of the institution. Objective conditions and criteria should be identified in order to ensure a level playing in its application by supervisors. In particular, a solid statistical historical assessment of the bank's losses in previous years should be established to confirm that the focus on losses above EUR 100 000 reliably represents the risk profile of this entity. The regulation should mandate the EBA to develop draft RTS that specify the criteria in accordance with which the competent authorities can use this discretion.

10. Output Floor

10.1 Impact of the aggregate output floor

397. The final Basel III framework introduces an aggregate output floor to the calculation of RWA by means of internal models. The rule provides that 'RWA must be calculated as the maximum of: (i) the total risk-weighted assets calculated using the approaches that the bank has supervisory approval to use in accordance with the Basel capital framework (including both standardised and internally-modelled based approaches); and (ii) 72.5% of the total risk weighted assets, calculated using only the standardised approaches […]'

398. The aim of the output floor is to reduce excessive variability of risk-weighted assets and to enhance comparability of risk-weighted capital ratios.

10.1.1 Impact of the output floor during the transitional period

399. This section elaborates on the impact of the transitional provisions foreseen for the implementation of the final Basel III framework in relation to the output floor.

400. The calibration of the output floor will be phased in at 50% of the total risk-weighted assets calculated using standardised approaches in 2022, and its calibration will increase every year to reach the 72.5% steady-state level in 2027 (Table 52). Furthermore, at discretion, supervisors may cap the increase in a institution's total RWA that results from the application of the output floor during its phase-in period. The transitional cap on the increase in RWA is set at 25% of a bank's RWA before the application of the floor.

Table 52 Phased-in implementation of the output floor (December 2017 revised BCBS standards)

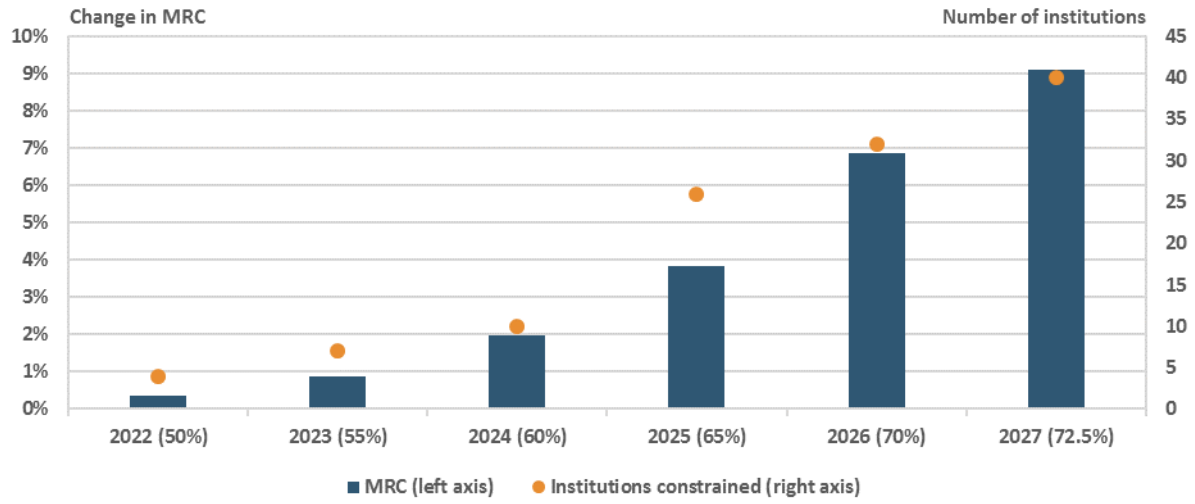
	1 Jan 2022	1 Jan 2023	1 Jan 2024	1 Jan 2025	1 Jan 2026	1 Jan 2027
Calibration	50%	55%	60%	65%	70%	72.5%

401. During the phase-in period, the contribution of the output floor to the total MRC impact increases almost steadily with the stepwise increase of its calibration (Figure 96):

- As long as the calibration remains below 55%, the output floor adds less than 1 percentage point to the EU-average increase in MRC.
- Beyond the 55% calibration level, the contribution of the output floor to the average MRC change almost doubles every year until 2026, reaching 7% when the output floor calibration is at 70%.

- In 2027, when the output floor reaches its steady-state 72.5% calibration, the contribution of the output floor to the EU average MRC is 9%. At this point the output floor constrains 40 internal model institutions within the sample (representing around 70% of the sample RWA).

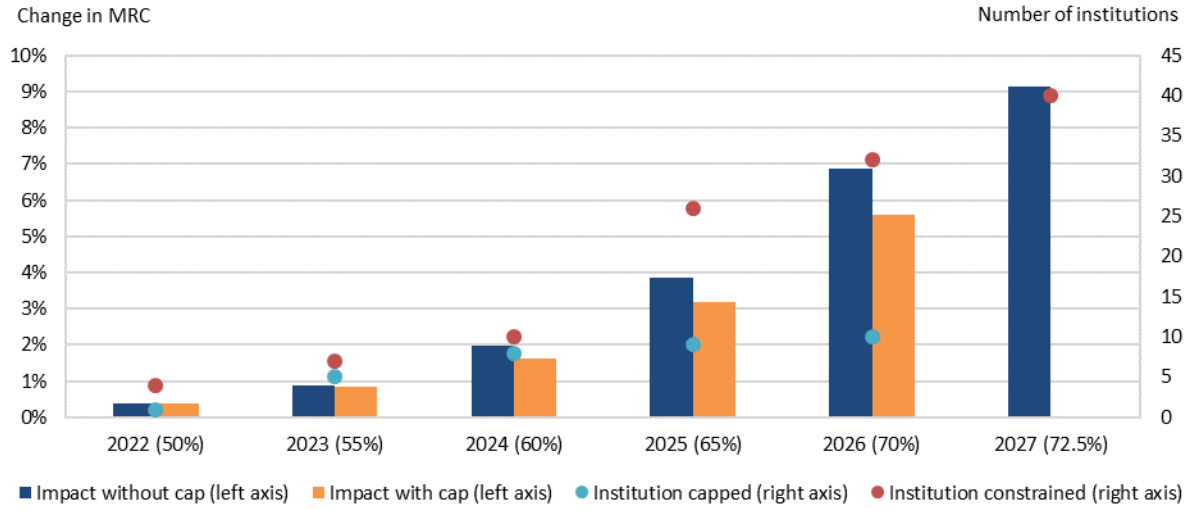
Figure 96 Contribution of the output floor to total EU-average MRC impact and number of internal model institutions constrained along the transitional period



Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 189 banks.

402. In the first year of implementation of the floor, only one institution in the sample would benefit from the transitional 25% impact cap, whereas up to 10 institutions would benefit from the cap in 2026, the last year of the transitional period (Figure 97). The implementation of the cap would increasingly dampen the impact of the output floor, reducing it by 25% in 2026. On the other hand, the cap would result in a cliff effect between 2026 to 2027 for banks that benefit from the cap.

Figure 97 Contribution of the output floor to total EU-average MRC impact with and without application of the transitional cap and number of internal model institutions that could benefit from the cap



Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 189 banks.

403. Similarly to the contribution to MRC, the contribution to the capital shortfall of the output floor also increases during the transitional period. Whereas approximately 3% of the total capital shortfall will be determined by the output floor during the first year of the transitional period (2022), at the steady state (2027) the output floor will determine almost half of the total capital shortfall incurred by the EU banks in the sample (Table 53).

Table 53 Capital shortfall (EUR billion): contribution of the output floor to the shortfall during the transitional period

Year (floor)	CET1 due to OF	CET1 w/o OF	Total CET1	T1 due to OF	T1 w/o OF	Total T1	TC due to OF	TC w/o OF	Total TC
2022 (50%)	1.5	46.2	**47.6**	2.1	71.4	**73.5**	2.1	78.4	**80.6**
2023 (55%)	2.2	46.2	**48.3**	3.3	71.4	**74.6**	2.8	78.4	**81.2**
2024 (60%)	8.3	46.2	**54.4**	10.5	71.4	**81.9**	9.9	78.4	**88.4**
2025 (65%)	18.4	46.2	**64.5**	23.0	71.4	**94.3**	23.0	78.4	**101.5**
2026 (70%)	33.1	46.2	**79.2**	40.4	71.4	**111.8**	40.5	78.4	**118.9**
2027 (72.5%)	45.0	46.2	**91.1**	56.2	71.4	**127.6**	56.7	78.4	**135.1**

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 189 banks.

10.1.2 Sensitivity of the output floor with respect to each modelable risk category

404. The risk categories for which regulatory capital can be internally modelled in the revised framework are credit risk, counterparty credit risk and market risk. Depending on the specific model approvals received, each institution may be subject to the output floor constraint due to one or more of these three risk categories. The contribution of each risk category to the output floor calculation depends primarily on the size of the gap between internally modelled RWA and standardised RWA but also on

the relevance of the risk category under consideration within the bank's overall balance sheet. This is because the output floor is designed as an aggregate, i.e. a balance-sheet-wide calculation, which means that its different components can offset each other in the final RWA floor calculation.

405. In order to shed light on which risk categories are more relevant in driving the outcome of the output floor calculation, the following analysis is performed on the EU-average MRC calculation:

a) a given risk category (e.g. credit risk) is excluded from the output floor calculation;[79]

b) the aggregate output floor is computed under the exclusion assumption in (a);

c) the impact of the output floor computed under the exclusion assumption is compared with the impact of the output floor computed as set out under the revised Basel III standards.

406. The above analysis is performed separately for each of the three risk categories subject to internal modelling in the revised framework.

407. As can be seen in Table 54:

- The most relevant risk category in driving the output floor impact is credit risk. When credit risk is excluded from the output floor calculation, no internal model institution in the sample is constrained by the output floor and the output floor contribution to the EU-average increase in MRC falls from 9% to zero.

- Market risk plays a minor role, in that its exclusion from the calculation releases three institutions from the constraint of the output floor and drives the impact of the output floor down by less than 2 percentage points.

- When CCR is excluded from the calculation, the impact of the output floor is almost unchanged, with the same number of institutions remaining constrained by the floor, suggesting that CCR is not a major driver of the average output floor constraint.

Table 54 Contribution of modellable risk categories to the output floor impact

	Basel III	Excluding credit risk	Excluding market risk	Excluding CCR
MRC change (%)	9.1	0.0	7.5	9.1
Number of institutions constrained	40	0	37	40

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 189 banks.

[79] Excluding a given risk category from the output floor calculation is equivalent, in this analysis, to assuming that that risk category is non-modellable: the standardised RWA for the risk category are used in the calculation of both the bank's total pre-floor RWA and the floored RWA.

10.1.4 Role of provisions in the calculation of the output floor

408. The objective of this section is to incorporate part of the differences of the treatment of provision between the IRB approach and the SA in the computation of the RWA add-on due to the output floor. This notwithstanding, a conclusive clarification of this issue needs to be sought from the BCBS.

409. The regulatory frameworks of the SA and the IRB approach substantially differ in the following aspects:

(i) IRB provisions' shortfall (excess) has to be deducted from the CET1 (added to T2) capital of the bank, whereas SA general provisions can be added to the T2 capital.

(ii) SA exposures are net of SA specific provisions, while IRB exposures are not.

410. In 2015 the BCBS published a consultation paper on output floors[80], highlighting potential ways of adjusting the output floor RWA calculation to fairly reflect those differences between SA and IRB approach.

411. On the basis of the proposal made in the BCBS consultation paper, the following adjustments were implemented in this section:

(a) The capital deduction/add-on due to IRB provisions' shortfall is converted into RWA equivalent by multiplying it by 12.5. This amount is then added to the total RWA in case of CET1 capital deduction and subtracted from the total RWA in case of addition to T2 capital to compute the adjusted modelled total RWA.

(b) The general provisions in the IRB portfolio would have been eligible to be added to the T2 capital up to a certain cap (1.25% of the SA RWA). Similarly to step (a), this amount is converted into RWA equivalent by multiplying it by 12.5 and it is subtracted from the total not modelled RWA to compute the adjusted not modelled total RWA.

(c) The RWA add-on due to the floor is computed as the positive difference between the 0.725% of the adjusted not modelled total RWA and the adjusted modelled total RWA.

(d) The adjusted RWA add-on is then added to the adjusted modelled total RWA. Together they constitute the base to compute the minimum capital requirements.

412. To avoid distortions of provisions and expected losses due to the application of IFRS9, the methodology has been implemented on the subsample of banks that applied IFRS9 without the transitional calendar (63 banks).

413. Table 55 shows the change in the number of banks constrained by each constraining requirement after the provisions' adjustment. Out of the 40 banks constrained by the output floor in the Basel III

[80] BCBS Consultative Document, 'Capital floors: The design of a framework based on standardised approaches', March 2015.

central scenario, 35 remain constrained, 5 are constrained by the RWs and 2 that were previously constrained by the RW reform would be constrained by the output floor after adjustment.

Table 55 Constraint analysis under Basel III central scenario and scenario using provision adjustments

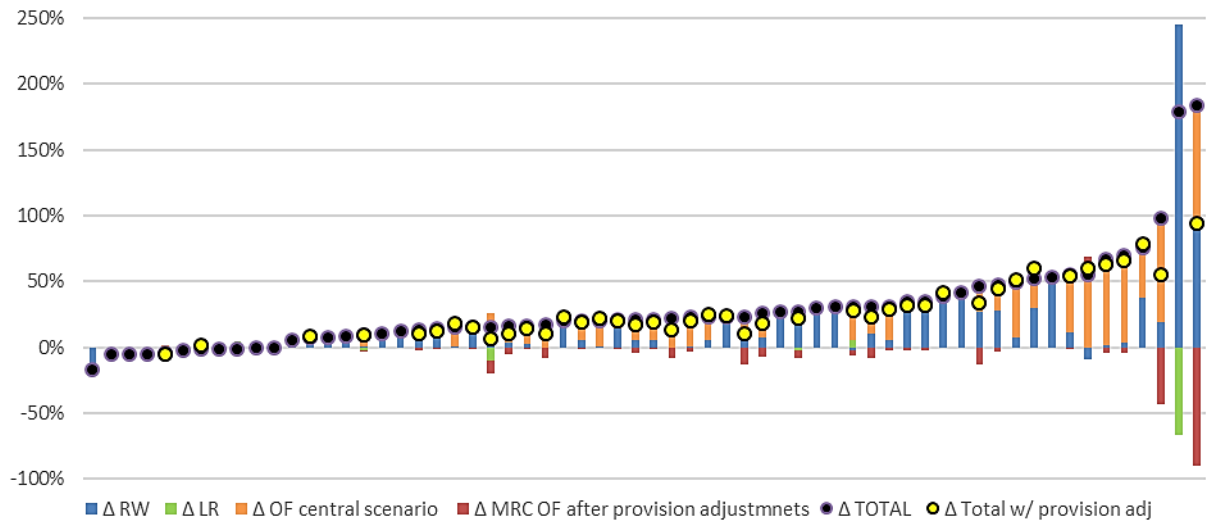
Constraint	LR	OF	RW	Total baseline scenario
LR	2	0	0	**2**
OF	0	35	5	**40**
RW	0	2	19	**21**
Total constrain with adj.	**2**	**37**	**24**	**63**

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 63 banks.

414. Figure 98 suggests that the application of the adjustment would have a different impact on different banks. It would mitigate the effect of the output floor, in particular, for banks with a high IRB shortfall and low or zero general provisions. For these banks, the adjusted modelled RWA would be higher than the modelled RWA, which reduces the impact of the output floor. On the other hand, banks with high surplus of provisions have lower adjusted modelled RWA – for these banks the impact of the output floor would be higher.

415. Figure 98 shows the distribution of the impact across the 63 banks. The comparison between the black and yellow dots shows whether a bank's MRC is increasing or reducing after the adjustment in the output floor calculation. The red bar indicates the difference between the MRC add-on due to the floor using the adjustment and the one without the adjustment. For most banks, the adjustment would lead to a MRC decrease. As a result of the adjustment some banks would no longer be constrained by the output floor and would instead become constrained by the unfloored RWA. Conversely, as a result of the adjustment some banks would become constrained by the output floor.

Figure 98 Percentage change in T1 MRC (relative to total current T1 MRC), Basel III central scenario versus scenario including provision adjustments



Sources: EBA 2018-Q2 QIS data and EBA calculations.

Note: Based on a sample of 77 banks.

416. The introduction of the provision adjustments would lead to a lower MRC increase over the selected sample. However, the impact strongly depends by the bank– specific characterisicts and the effect of the sample is heterogeneous across the selected banks.

417. The analysis carried out in this section only adjusts the RWA comparison on which the output floor calculation is based for the different treatment of provisions across the SA and IRB frameworks. In particular, the analysis adjusts IRB RWA by taking into account the RWA-equivalent of IRB excess/shortfall adjustments. The analysis does not take into account the role of accounting provisions in the calculation of the floor where these fully cover the prudential EL, as it might be the case for some IRB institutions holding high volumes of NPLs or, more generally, exposures characterised by high levels of credit risk. For these institutions, the credit risk might be almost entirely reflected in the EL component and fully covered by provisions, leaving them with low levels of IRB RWA (the latter to cover unexpected losses) and hence relatively more penalized in the output floor calculation.

10.2 Alternative scenarios

418. As explained in Chapter 3, for institutions constrained by the output floor, the total MRC is computed by applying the full stack of capital requirements applicable in the EU, i.e. Pillar 1 minimum capital requirements, Pillar 2 requirements and the combined buffer requirement to the floored RWA. This implementation approach is labelled the **main OF approach**.

419. Following the EBA's consultation with the industry, two additional approaches were considered for the application of the output floor (Box 3):

- The **alternative approach**, whereby the floored RWA will be applied only to the capital requirements explicitly mentioned by the Basel III standards on the output floor, i.e. the Pillar 1 minimum capital requirements, the CET1 capital conservation buffer and the CET1 G-SII buffer (where applicable). The pre-floor RWA would be applied to Pillar 2 requirements as well as the systemic risk buffer.

- The **parallel stacks approach**, whereby the output floor requirement is calculated taking into account the requirements explicitly mentioned by the Basel III standards, but would serve as a backstop amount to the full stack of EU capital requirements, i.e. to the Pillar 1, Pillar 2 and combined buffer requirements RWA. The impact of the parallel stacks approach is not assessed in this report, as the proposal is considered non-compliant with the Basel III standards.

Box 3 Three approaches to implement the output floor (MRC calculation)

Main approach: MRC =
Floored RWA × (Pillar 1 minima + Pillar 2 + combined buffer)

Alternative approach: MRC = sum of:
Floored RWA × [Pillar 1 minima + CCB buffer + CCyCB buffer + max (G-SII,O-SII buffer)];
Pre-floor RWA × (Pillar 2 + contribution[81] of the SRB buffer to the combined buffer)

Parallel stacks approach: MRC = higher of:
Floored RWA × (Pillar 1 minima + CCB buffer + CCyCB buffer + G-SII buffer);
Pre-floor RWA × (Pillar 1 minima + Pillar 2 + combined buffer)

Note: CCB, capital conservation buffer; CCyCB, countercyclical capital buffer.

420. Under the alternative approach, the MRC percentage change will decrease from 24.5% to 22.4% (Table 56). This decrease stems entirely from the output floor, as its contribution to the MRC change goes down from 9.1 p.p. to 7.1 p.p. The contribution of all the other components to the MRC percentage change, namely each risk category and overall RWs as well as leverage ratio, will remain unchanged.

Table 56 Percentage change in T1 MRC (relative to total current T1 MRC), EU weighted averages

Approach	SA	IRB	SEC	CCP	OP	CVA	MR	Other	RWs	LR	OF	Total
Main approach	2.7	2.7	0.6	0.1	3.3	4.0	2.5	15.8	15.8	-0.5	9.1	24.5
Alternative approach	Same as main approach								7.1			22.4

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Notes: Based on a sample of 189 banks. SA, standardised approach to credit risk; IRB, internal rating-based approach to credit risk; CCP, central counterparty; SEC, securitisation; MKT, market risk; OP, operational risk; CVA, credit valuation adjustment; LR, leverage ratio; OF, output floor.

421. Despite the change in MRC, the number of institutions that are constrained by risk weights, output floor or leverage ratio would remain roughly the same if an alternative approach were adopted. Based on the QIS sample, only one institution that was previously constrained by output floor becomes constrained by leverage ratio (Table 57).

Table 57 Number and percentage RWA of internal model institutions (highest level of EU consolidation) constrained by the different regulatory metrics, main approach versus alternative approach

	Number of banks				% of total RWA		
	RWs	LR	OF		RWs	LR	OF
Baseline	63	16	0	79	96.4	3.6	0.0
Basel III OF main approach	34	5	40		29.0	0.4	70.7
Basel III OF alternative approach	34	6	39		29.0	0.4	70.6

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 79 banks.

[81] Contribution of the systemic risk buffer (SRB) to the combined buffer requirement means i) excess of SRB over max (G-SII buffer, O-SII buffer) if the institution applies Article 131(14) of the CRD and ii) the whole SRB amount if the institution applies Article 131(15) of the CRD.

10.3 Assessment of the output floor and leverage ratio as backstops against RWA variability

422. The main objective of the output floor is to reduce the excessive variability of RWA across institutions.

423. Out of the 189 institutions in the QIS sample, which includes both institutions using exclusively standardised approaches and institutions that to some extent use internal models, the majority (127) are constrained by the unfloored RW-based metric of capital (RWs), 40 institutions are constrained by the output floor (OF) and 22 are constrained by leverage ratio (LR).

424. The institutions constrained by the RW-based metric of capital account for only about 26% of EU banking assets. The institutions constrained by output floor (which by construction are institutions using internal models) represent about 58% of the total EU banking assets. Finally, the institutions constrained by leverage ratio represent only around 3% of the total EU banking assets (Table 58).

Table 58 Coverage of EU total banking assets by constraint group

Constraint	Number of banks	% of EU total assets
RWs	127	25.6
LR	22	2.9
OF	40	57.9
All banks	**189**	**86.3**

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 189 banks.

425. As seen in relation to the drivers of increase in MRC, the output floor is expected to be more constraining for large and systemically important institutions. It is particularly constraining for G-SIIs, whereby only 1 out of 8 institutions is not constrained by the output floor. By definition, small institutions are not constrained by the output floor, as they do not use any internal model in the revised framework (Table 59).

Table 59 Constraint analysis by bank size

Bank size	Number of banks			All banks
	RWs	LR	OF	
All banks	127	22	40	**189**
Large	57	11	36	**104**
of which G-SIIs	1	0	7	**8**
of which O-SIIs	40	4	23	**67**
Medium	49	8	4	**61**
Small	21	3	0	**24**

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 189 banks.

426. In terms of RWA composition, the proportion of RWA calculated under internal models, for either credit risk or market risk, is substantially higher for the group of institutions constrained by the output

floor than it is for the group of banks constrained by the (unfloored) risk weights or the leverage ratio (Table 60).

Table 60 Composition of RWA by constraint group

Constraint	Number of banks	Credit risk		Market risk				
		SA (%)	IRB (%)	SA (%)	IMA (%)	OP (%)	CVA (%)	Other (%)
RWs	127	53.8	27.6	2.4	1.2	10.2	3.6	1.2
LR	22	73.3	13.3	1.0	0.0	9.2	1.1	2.0
OF	40	20.2	53.6	2.5	3.6	13.4	4.3	2.4

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 189 banks.

427. Banks constrained by the output floor show a substantially lower IRB RWA/SA-equivalent ratio (50% versus 67%) and a higher concentration of IRB RWA over total RWA (54% versus 40%) than banks constrained by risk weights. On the other hand, banks constrained by the leverage ratio have a greater distance between IRB and SA equivalent and a higher IRB RWA compared with their total RWA. However, these banks, even after the application of the SA-equivalent RWA, have low risk weights compared with the total exposures, so the leverage ratio is the main requirement.

Table 61 IRB /SA-equivalent RWA ratio and IRB over total RWA (banks using IRB approach)

Constraint	Number of banks	IRB / SA-equivalent RWA ratio (%)	IRB / total RWA ratio (%)
RW	32	67	40
LR	5	44	62
OF	40	50	54

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 77 banks.

428. Table 62 shows similar results regarding the market risk portfolio. Banks constrained by the output floor make more use of internal models and have a greater distance between IMA RWA and SA-equivalent RWA.

Table 62 IMA /SA-equivalent RWA ratio (banks using IMA approach)

Constraint	Number of banks	Ratio (%)	IMA RWA / total RWA (%)
RW	4	69.10	2.90
OF	11	54.50	5.42

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 15 banks.

429. The group of institutions constrained by the output floor accounts for more than 70% of the total shortfall amount, across the three layers of regulatory capital (Table 63), whereas the shortfall reported by institutions constrained by the leverage ratio is negligible.

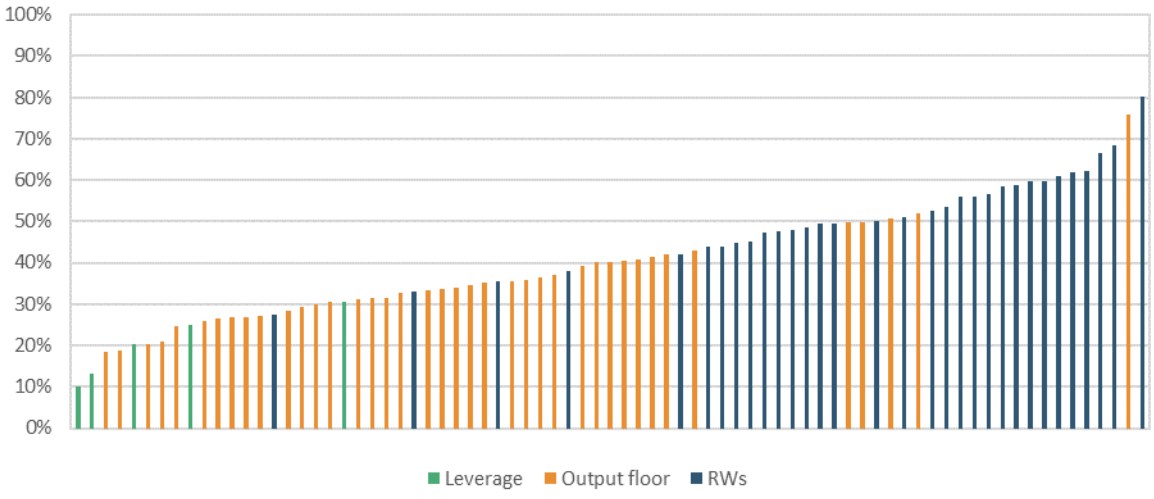
Table 63 Shortfall by constraining requirement

Constraint	CET1		T1		TC	
	Number of banks	Shortfall (EUR bn)	Number of banks	Shortfall (EUR bn)	Number of banks	Shortfall (EUR bn)
Leverage Ratio	0	0.0	22	1.0	12	1.0
Output floor	43	69.5	40	93.0	42	100.1
RWs	146	21.6	127	33.5	135	34.0
All banks	189	91.1	189	127.5	189	135.1

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 189 banks. The leverage ratio is a T1 requirement, so no banks will be constrained by the leverage ratio at CET1 capital level.

430. The LR tends to act as a backstop on those internal model institutions that operate at very low levels of RWA density[82] before the application of the output floor (green bars in Figure 99). The output floor is the prevailing constraint of internal model banks on the left tail of the RWA density distribution but is found to reach some banks that operate at substantially higher levels of RWA density before the application of the output floor (orange bars in Figure 99).

Figure 99 Distribution RWA density of internal model institutions before implementation of the output floor



Sources: EBA 2018-Q2 QIS data and EBA calculations.
Notes: Based on a sample of 77 banks. Colour represents final constraint for the bank.

431. Of the 22 institutions constrained by the LR (both standardised and internal model institutions), the vast majority (19) have the risk weights as the second highest constraint (Table 64). Of the 40 institutions constrained by the output floor, only 6 would be constrained by the LR if the output floor were not part of the framework, with the remaining 34 having the (unfloored) risk weights as the second highest constraint.

[82] The RWA density is computed as the ratio of the total RWA to the current total asset of each bank. As the RWA changes under the different frameworks, the denominator is kept constant.

Table 64 Main constraint (row) and second highest constraint (column) on banks in the sample (number of banks)

	Second constraint		
Main constraint	**LR**	**OF**	**RWs**
LR		3	19
OF	6		34
RWs	127		

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Notes: Based on a sample of 189 banks.

432. Looking at the average distance between first and second highest constraints shows the following (Table 64 and Table 65):

- For the 19 institutions that would be constrained by the risk weights if the LR were not there, the leverage ratio implies, on average, a material increase in MRC (42%). This confirms that the LR acts as a backstop on banks that operate at very low levels of RWA before the application of any backstop.

- Conversely, institutions constrained by the risk weights operate at relatively high levels of capital requirement, far above the capital levels that the LR would require them to hold: for the 127 institutions that would be constrained by the LR if the risk weight requirement were not there, the risk weight requirement implies, on average, a material increase in MRC (49%).

- The output floor, as a main constraint, does not seem to imply a material increase in MRC (11%) on those institutions that would be constrained by the risk weights in its absence. Conversely, it implies a major increase in MRC (32%) on those banks that in its absence would be constrained by the LR.

Table 65 Distance in MRC between main constraint (row) and second highest constraint (column) on banks in the sample (%)

	Second constraint		
Main constraint	**LR**	**OF**	**RWs**
LR		14.3	42.1
OF	32.0		11.3
RWs	48.8		

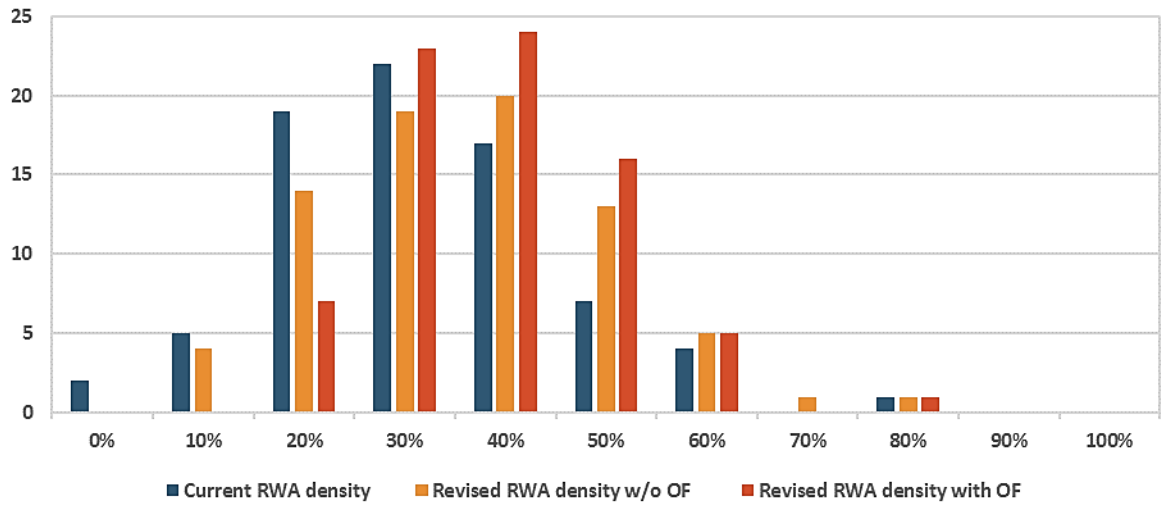
Sources: EBA 2018-Q2 QIS data and EBA calculations.
Notes: Based on a sample of 189 banks.

433. Overall, the analysis suggests that the LR appears to constrain banks on the very low end of the RWA distribution and, for these institutions, it adds materially to the risk-weight-based capital requirement. Unfloored RWs and the OF constrain banks that operate at substantially higher RWA levels and add materially to the capital requirements that banks would have to meet as a result of the LR.

434. Both the reform of the risk weights and the introduction of the output floor lead to an overall increase of risk weight densities, i.e. a rightward shift in the RWA density distribution. The changes in risk weights alone (from blue to yellow bar in Figure 100) increase the average risk weight and concentrate the distribution around its mean, i.e. the density distribution becomes narrower. The implementation of the output floor (from yellow to red bar in Figure 100) mainly affects institutions located in the left tail of the RWA density distribution, and contributes to an additional increase of the average risk weight.

435. The leverage ratio does not directly affect RWA densities (i.e. the leverage ratio is not a RW-based metric of capital) but constrains internal model institutions with particularly low RWA densities. Out of the five banks that use internal models and are constrained by the leverage ratio, four have an RWA density in the range 20-29% and one in the range 30-39%. In this vein, the leverage ratio dampens the impact of the RWA dispersion on the overall distribution of capital requirements in the sample.

Figure 100 RWA density distribution under different frameworks for internal model institutions



Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 77 banks. OF, output floor.

10.4 Implementation and policy issues

IMPORTANT NOTE: This section only includes those policy recommendations on output floor for which QIS data was collected, as illustrated in this report. Additional recommendations on the output floor, and more detailed policy rationale, can be found in the EBA Report 'Policy advice on the Basel III reforms: output floor' accompanying this publication. **The numbering of the recommendations in this section is aligned with the numbering used in that accompanying report.**

436. The output floor is one of the global measures aimed at restoring the credibility of internal models used for regulatory capital purposes. Not implementing this measure would undermine the credibility

of internal models in the EU. Given the significant efforts by EU and national competent authorities to ensure the continued use of internal models and in the light of the initiatives aimed at ensuring a harmonised implementation of internal models — including the efforts by the EBA to harmonise the regulatory framework — it is considered of utmost importance that the output floor is implemented in the EU.

Recommendation OF 1: Introduction of the output floor in the EU

The output floor should be implemented in the EU in compliance with the Basel agreement and calibrated at 72.5% of the total RWA computed under the standardised approaches, to introduce a credible backstop to internal models used for capital requirements purposes.

10.4.1 Type of output floor to be implemented

437. As described in the previous sections of this chapter, discussion with industry stakeholders shed light on three different approaches to the implementation of the aggregate output floor (Box 3)

438. The alternative approach is not recommended due to important drawbacks with its implementation. These drawbacks include the need to recalculate the applicable percentage rate for some of the layers (systemic risk buffer (SRB), Pillar 2 requirements) as a result of the calculation on the basis of internal models RWA and the subsequent conversion as a percentage of floored RWA, which leads to complexity and lack of transparency, as well as different applicable percentage rates any time there is a change in internal model RWA or floored RWA. Another drawback is that there is no justification of why the setting of the systemic risk buffer and Pillar 2 would be based on internal model RWA while other macroprudential buffer requirements are calculated on the basis of floored RWA. Finally, it reduces comparability between institutions.

439. Any approaches based on parallel stacks are strongly rejected. Importantly, they would reduce the output floor to a very minor role, with the risk-based requirement continuing to be based on the RWAs resulting from internal-model-based approaches. In particular, they would circumvent impacts on the basis that the stack based on internal model RWA is likely to exceed the output floor requirement for most institutions. Conversely, for institutions for which the output floor requirement leads to the highest amount of capital requirements, there may be no changes in capital requirement stemming from the introduction of EU-specific buffers.

440. In addition, they may be deemed inappropriate, since parallel stacks would create confusion about trigger levels, such as that of AT1 or those associated with minimum distributable amount (MDA), as these levels would be calculated in both the internal models RWA stack and the floored RWA stack. More fundamentally, this interpretation would not be in compliance with the Basel agreement, because it is based on a comparison of two amounts of capital requirements, whereas the Basel text states that the capital ratio requirements should be applied to the institution's floored RWA.

441. The main approach, which is by construction more conservative than the other two approaches in terms of capital requirement outcome in all cases where the output floor is an active constraint, allows a simple and straightforward implementation of the Basel III disclosure framework of regulatory ratios and regulatory requirements, without introducing additional complexities.

Recommendation OF 2: Type of output floor to be implemented
The output floor should be implemented in compliance with the Basel agreement in accordance with the main approach described, i.e. all the full stack of capital requirements should be calculated and expressed on the basis of institutions' floored RWA, including the countercyclical buffer, G-SII buffer, O-SII buffer, capital conservation buffer, the systemic risk buffer and Pillar 2 requirements.

10.4.2 Interaction of the output floor with other prudential requirements

Pillar 2 and the SRB

442. Pillar 2 consist of a variety of elements, as described in detail in the 'Guidelines on the revised common procedures and methodologies for the supervisory review and evaluation process (SREP) and supervisory stress testing' published on 19 July 2018.[83] Some of the elements in the EBA SREP guidelines may be subject to a trade-off with the output floor. In particular, if these add-ons are currently required to compensate for deficiencies in the measurement of these elements in Pillar 1 due to the use of internal models (paragraph 257 of the EBA Guidelines), an extensively constraining output floor could be a reason to remove these add-ons. It will be important to carefully consider the implementation of the Pillar 2 add-ons, so that there is no overlap between current Pillar 2 charges and the output floor.

Recommendation OF 3: Pillar 2 decisions
Competent authorities should re-consider the appropriate level of Pillar 2 to ensure that these amounts take due account of the new output floor requirements. In addition, the EBA Guidelines on SREP should be reviewed with this in mind.[84]

443. Regarding the SRB, there are two main effects that are important for designated authorities (DAs) to appropriately adjust for in the implementation of the output floor. Firstly, it is important for DAs to consider that an inappropriate or disproportionate impact of the SRB may occur where the SRB would, to some extent, address objectives that are similar to that of the output floor. It is to be noted that the purpose of the SRB is to prevent and mitigate systemic or macroprudential risks. Given this, the SRB should not address model risks and model deficiencies that in the revised framework will be addressed by the output floor. Notwithstanding this, as a matter of fact the implementation of the SRB has so far targeted the largest/most systemically relevant institutions in the Member States where it has been applied, which happen to be the institutions that mostly rely on internal models for the calculation of RWA. For these reasons, DAs should take due account of the output floor requirement when calibrating SRB rates once the revised Basel III framework enters into force.

444. The second main effect for DAs to take into account is that the SRB, in accordance with Article 133(11) of the CRD, would be particularly affected by an increase of RWAs due to the implementation of the floor, with an unchanged SRB rate leading to higher amounts in euros for this capital requirement.

[83] Guidelines for common procedures and methodologies for the supervisory review and evaluation process (SREP) and supervisory stress testing.

[84] If Pillar 2 requirements were implemented as an absolute amount instead of a fixed percentage of RWA (see section 2.4.4) the T1 MRC change would be around 20% of current MRC.

445. Against the backdrop of these considerations, it may be appropriate for DAs to reconsider the sets of institutions to which the SRB applies as well as the applicable rate(s).

Recommendation OF 4: Systemic risk buffer
Designated authorities are recommended to re-consider the appropriate level of the SRB rate(s) for output floor-constrained institutions, once the revised Basel III framework enters into force in EU legislation, to ensure no overlap in objectives between the macroprudential measure and the output floor or unintended increases in the requirement due to an increase in RWA.

10.4.3 Other implementation issues related to the aggregate output floor

Scope of application of the output floor

446. The aggregate output floor is expected to have a different impact depending on whether it is applied at both consolidated and individual levels — as it is the case for most Basel III prudential standards transposed in the EU — or only at consolidated level. In banking groups where individual entities are authorised to use internal approaches and carry out specific business models, the cumulative impact of the output floor implemented at solo level on all the entities of the group could be somewhat higher than the impact of the output floor measured — for the same group — at the highest level of consolidation in the EU. This is mostly due to the following reasons: i) at individual level, the impact of the floor on specific business lines/portfolios might not be offset by the inclusion in the aggregate calculation of business lines/portfolios that are less or not at all affected by the output floor (i.e. no dilution effect in the aggregate output floor calculation); ii) at solo level the output floor also acts on intra-group exposures that are, instead, mostly netted out at the highest level of consolidation. The materiality of these effects depend on the specific structure of each banking group and whether capital at subsidiary level is raised internally or externally.

447. It should be noted that all the existing capital requirements in the CRR are applied at individual level, including the leverage ratio, which similarly to the output floor is a backstop requirement. A decision to apply the output floor only at consolidated level would represent a departure from the current application of capital requirements in the EU. Application of the output floor solely at consolidated level may potentially result in economic risks present at individual level not being covered by sufficient amounts of regulatory capital.

448. Furthermore, it could be argued that applying the output floor also at individual level would help achieve the objective of addressing undue RWA variability across entities at the individual level, and would enhance the level playing field between institutions operating as subsidiaries within large groups and medium/small institutions operating as standalone entities, i.e. not as part of large groups.

449. In terms of the ability of competent authorities to waive the application of the output floor on an individual level, there is the general capital requirement waiver of Article 7 of the CRR as well as that of Article 10 of the CRR for credit institutions permanently affiliated to a central body. These waivers would, however, waive not only the output floor requirement but also the whole capital requirement

and leverage ratio requirement. In addition, these waivers would not be available in situations where the individual institution and its parent institution are established in different Member States.

Recommendation 8: Scope of application of the output floor

The output floor requirement should generally apply at all levels, just like other prudential requirements. Competent authorities should consider the impact of the implementation of the output floor at different levels and consider neutrality in respect of business models in their waiver policy.

Role of provisions in the calculation of the output floor

450. Under the various options the impact of the output floor may be somewhat alleviated, but there may be considerable drawbacks and inconsistencies with the broader prudential framework. For these reasons, an implementation without any adjustment[85] strongly appears the most appropriate way forward, particularly given that developments, such as the implementation of IFRS9, are ongoing and work is still being performed by the BCBS regarding consistency in the treatment of provisions.

Recommendation OF 9: Provisioning and the calculation of the output floor

Make no adjustments to the output floor based on accounting provisions, in line with the Basel Committee on Banking Supervision standards.

[85] Apart from the regular adjustment of the exposure value of the SA for special credit risk adjustments (Article 111(1) of the CRR) in the calculation of the floored RWA, as in line with the Basel framework.

11. Analytical focus on subsidiaries

451. The analysis presented in Chapter 3 uses data at the highest level of EU consolidation. To improve the representativeness of the sample in terms of business model and shed light on the impact of the reform at solo-level, institutions were asked to report aggregate impact results for their largest subsidiary within each business model as part of the qualitative questionnaire. Moreover, a limited number of subsidiaries have participated in the QIS data collection, on the basis of which impact figures were estimated.

11.1 Results of the qualitative questionnaire

452. In total, 62 groups provided information on their subsidiaries as part of the qualitative questionnaire. Due to data quality, not all of them could be included in the analysis. Table 66 shows the breakdown by business model of the 59 subsidiaries, belonging to 46 distinct groups, that are included in the analysis.

Table 66 Number of subsidiaries included in the analysis, clustered by business model

Subsidiary business model	Number of banks
Auto & Cons	3
Building Soc	2
Cross-border U	8
Custody	1
Leasing	4
Local U	23
S&L Coop	2
Merchant	1
Mortgage	7
Other special	5
Private	3

Sources: EBA CfA qualitative questionaire and EBA calculations.

453. The impact of the reform is also uneven on institutions operating different business models (Table 67). In particular:

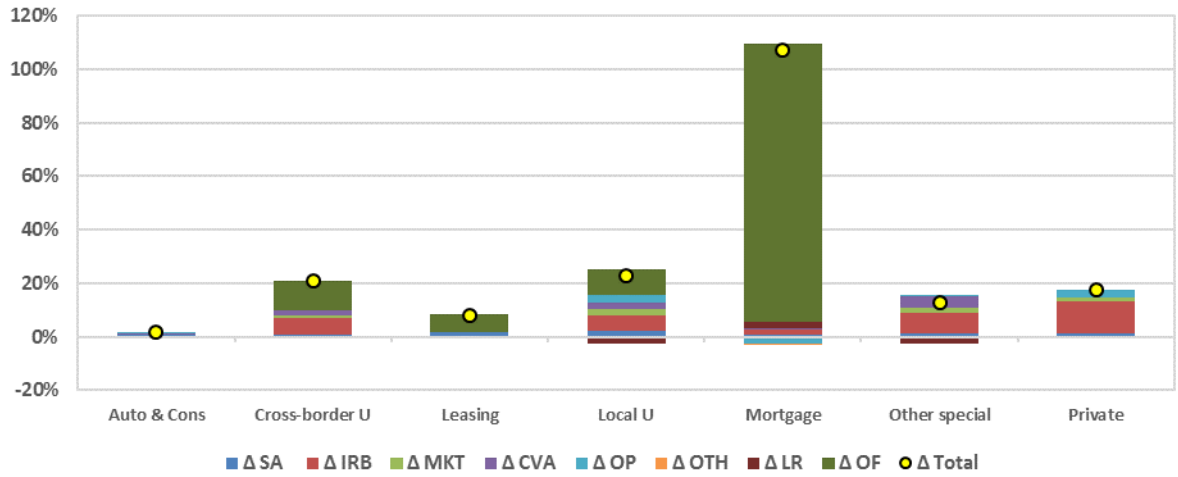
- the main driver of the overall impact is the output floor, the impact of which is particularly pronounced for cross-border universal banks, local universal banks, locally active savings and loan associations/ cooperatives, and mortgage banks;[86]
- the new IRB framework is also an important driver of impact, mostly for local universal banks and other specialised banks;

[86] The results for mortgage banks are driven by 1 outlier bank.

- the new operational risk framework increases the capital requirements for most business models, with the exception of cross-border universal, custody, leasing, mortgage and private banks, which see their capital requirements decreasing;

- building societies and private banks see their capital requirement increase mostly due to the revisions in the standardized approach.

Table 67 Percentage change in T1 MRC of subsidiaries (relative to total current T1 MRC), by business model



Sources: EBA CfA qualitative questionaire and EBA calculations.
Notes: Based on a sample of 59 banks: Auto & Cons (3), Building Soc*(2), Cross-border U (8), Custody* (1), Leasing (4), Local U (23), S&L Coop* (2), Merchant* (1), Mortgage (7), Other special (5), Private (3).
* Not shown in the chart because fewer than three entities in the cluster.

454. The constraint analysis looks at the number of institutions in the sample that will be constrained by each of the three different metrics of regulatory capital. The results are as follows (Table 68 and Table 69):

- Among internal model institutions, which are institutions that use internal models in at least one risk area in the Basel III central reform scenario, around 34.2% institutions are constrained by leverage ratio (LR) in the baseline scenario, with the remaining 65.8% being constrained by model RWA. In the revised scenario, the number of institutions constrained by LR is reduced to 13.2%, and 39.5% are constrained by the output floor (OF). The number of institutions constrained by model RWA goes down to 47.4%;

- Among standardised-only institutions, around 14.3% are constrained by the leverage ratio in the baseline scenario. In the revised scenario, only one institution that was previously constrained by risk weights becomes constrained by LR (out of 21 standardised institutions); therefore, it was concluded that in the revised framework the constraints on standardised institutions remains broadly the same.

Table 68 Number of internal model institutions constrained by each regulatory metric, subsidiaries qualitative analysis

Scenario	RWs	LR	OF	Total	RWs (%)	LR (%)	OF (%)
Baseline	25	13	0	38	65.8	34.2	0.0
Central scenario	18	5	15		47.4	13.2	39.5

Sources: EBA CfA qualitative questionnaire and EBA calculations.
Notes: Based on a sample of 38 banks.

Table 69 Number of standardised institutions constrained by each regulatory metric, subsidiaries qualitative analysis

Scenario	RWs	LR	Total	RWs (%)	LR (%)
Baseline	18	3	21	85.7	14.3
Central scenario	19	2		90.5	9.5

Sources: EBA CfA qualitative questionnaire and EBA calculations.
Notes: Based on a sample of 21 banks.

455. To shed some light on the importance of the output floor at the consolidated level versus the individual level, the impact of the output floor on a subsidiary is compared with the impact of the output floor at the consolidated level (Table 70). Out of 15 subsidiaries constrained by the floor, 13 belong to a groups that are also constrained at the consolidated level.

Table 70 Number of institutions constrained by each regulatory metric, group versus subsidiary, qualitative analysis

		Subsidiary constraint		
		RWs	**LR**	**OF**
Group constraint	**RWs**	27	2	2
	LR	1	3	0
	OF	9	2	13

Sources: EBA CfA qualitative questionnaire, EBA 2018-Q2 QIS and EBA calculations.
Notes: Based on a sample of 59 banks.

11.2 Results of the QIS data collection for subsidiaries

456. The impacts on the 15 subsidiaries that submitted QIS data is presented in this section. Due to the limited number of institutions considered, any conclusions should be interpreted with caution.

457. Consistent with the main results, the output floor is the main driver of the overall impact. The result is driven by three banks, for which the impact of the output floor is more than 15% (Table 71).

Table 71 Percentage change in T1 MRC of subsidiaries (relative to total current T1 MRC), by bank size

Bank size	Δ SA	Δ IRB	Δ CCP	Δ SEC	Δ MKT	Δ OP	Δ CVA	Δ LR	Δ OF	Δ Total
All banks	**1.4**	**3.6**	**0.0**	**0.8**	**3.1**	**0.7**	**3.4**	**-0.6**	**13.3**	**25.8**
Large	1.4	4.1	0.0	0.8	3.2	0.7	3.6	-0.7	14.0	27.1
of which: O-SIIs	1.4	4.1	0.0	0.8	3.2	0.7	3.6	-0.7	14.0	27.1
Medium	1.3	-5.7	0.0	0.0	0.0	0.9	0.0	0.0	0.0	-3.5

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Notes: Based on a sample of 15 banks: Large (13), of which O-SIIs (13), Medium (2). SA, standardised approach to credit risk; IRB, internal rating-based approach to credit risk; CCP, central counterparty; SEC, securitisation; MKT, market risk; OP, operational risk; CVA, credit valuation adjustment; LR, leverage ratio; OF, output floor.

458. Turning to the constraint analysis, the results show that:

- the output floor will be the predominant constraining metric for internal model banks under the revised framework (Table 72), with three banks moving from a model RWA constraint at the baseline and two banks from an LR constraint;
- all standardised banks will remain under the model RWA constraint (Table 73).

Table 72 Number of internal model institutions constrained by each regulatory metric, subsidiaries QIS analysis

Scenario	RWs	LR	OF	Total	RWs (%)	LR (%)	OF (%)
Baseline	6	3	0	9	46.3	53.7	0.0
Central scenario	3	1	5		10.2	1.3	88.6

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 9 banks.

Table 73 Number of standardised institutions constrained by each regulatory metric, subsidiaries QIS analysis

Scenario	RWs	LR	Total	RWs (%)	LR (%)
Baseline	6	0	6	100.0	0.0
Central scenario	6	0		100.0	0.0

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 6 banks.

Annex 1: Sample and methodology

Business models

Table 74 List and description of business models

Business model	Description
Cross-border universal banks	**Activity**:
	Engaged in several banking activities including retail, corporate and capital market operations.
	Operating across borders.
	Funding:
	Diversified sources of funding including deposits from clients, wholesale funding and derivatives liabilities.
	Significant part of the funding can come from foreign investors.
	Ownership/statute: no specification (can be cooperative banks).
Local universal banks	**Activity:**
	Engaged in diversified banking activities including retail, corporate and capital market operations,
	Operating predominantly in their domestic market.
	Funding:
	Diversified sources of funding including deposits from clients, wholesale funding and possibly derivatives liabilities.
	Predominantly funded in their do0mestic market.
	Ownership/statute: no specification (can be cooperative banks).
Automotive and consumer credit banks	**Activity**:
	Specialised in originating and/or servicing consumer loans to retail clients.
	Funding: no specification.
	Ownership/statute: no specification (may be owned in the form of a captive bank by the corporate company that provides the consumer good for which the loan is granted).
Building societies	**Activity:**
	Mainly specialised in the provision of residential loans to retail clients.
	Funding:
	Mainly funded through deposits.
	Ownership/statute:
	Subject to specific statutory requirements.
Locally active savings and loan associations/cooperative banks	**Activity:**
	Focusing on retail banking and SMEs (payments, savings products, credits and insurance)
	Operating locally through a decentralised distribution network.
	Funding:
	Mainly funded through deposits.
	Ownership/statute: no specification (can be cooperative banks).
Private banks	**Activity:**
	Predominantly providing wealth management services to high net worth individuals and families.
	Funding:
	Mainly funded through deposits.

Business model	Description
	Ownership/statute: no specification (can be cooperative banks).
Custody banks	**Activity:**
	Offering predominantly custodian services (i.e. holding customers' securities in electronic or physical form for safekeeping to minimise the risk of loss).
	May also provide other services including account administration, transaction settlements, collection of dividends and interest payments, tax support and foreign exchange.
	Funding: no specification.
	Ownership/statute: no specification.
Central counterparties	**Activity:**
	Specialised in settling trading accounts, clearing trades, collecting and maintaining margin monies, regulating delivery and reporting trading data.
	Providing a guarantee for the obligations under the contract agreed between two counterparties, ensuring the future performance of open contracts.
	Funding: no specification.
	Ownership/statute: no specification.
Merchant banks	**Activity:**
	Financing domestically and in international trade.
	Offering products such as letters of credit, bank guarantees. and the collection and discounting of bills.
	Funding: no specification.
	Ownership/statute: no specification.
Leasing and factoring banks	**Activity:**
	Specialised in leasing (asset-based financing) and/or factoring activities (i.e. financing method in which the bank pays a company the value of the receivables (invoices) less a discount for commissions and fees).
	Funding: no specification.
	Ownership/statute: no specification.
Public development banks	**Activity:**
	Specialised in financing public-sector projects and/or the provision of promotional credit or municipal loans.
	Funding: no specification.
	Ownership/statute:
	Majority owned by the state/public sector.
	May be subject to specific statutory requirements.
Mortgage banks including pass-through financing mortgage banks	**Activity:**
	Specialised in directly originating and/or servicing mortgage loans.
	Funding:
	Predominantly funded through the issuance of covered bonds.
	Ownership/statute: no specification.
Other specialised banks	**Activity:**
	Banks not included in the above categories included sharia compliant banks and pass-through financing model (not specialised in mortgage lending).
	Funding: no specification.
	Ownership/statute: no specification.

Sample coverage

Table 75 QIS cumulative sample coverage in terms of banking assets, by country and total EU

Country	QIS assets as % of total domestic assets
AT	74
BE	99
DE	63
DK	93
EE	15
ES	84
FI	87
FR	99
GR	74
HU	73
IE	126*
IT	99
LU	103*
MT	12
NL	95
NO	55
PL	88
PT	79
SE	93
Total	**85**

Sources: EBA 2018-Q2 QIS data, ECB Statistical Data Warehouse, Norges Bank 2018 Financial Stability Report, and EBA calculations.
Notes: Total domestic assets is total assets of domestic banking groups. For Norway, total domestic assets is total assets of banks, excluding branches of foreign banks, mortgage companies (including branches of foreign companies), finance companies (including branches of foreign companies) and state lending institutions. QIS assets excludes QIS institutions that are subsidiaries of EU-27 parents.

* Percentages higher than 100% are due to the presence of foreign-controlled (non-EU) subsidiaries in the QIS sample of certain EU Member States (e.g. subsidiaries of US institutions located in the EU).

Inclusion criteria and data quality adjustments

Inclusion criteria

459. As explained in section 2.3, this report uses three different types of samples depending on whether the impact analysis refers to:

- the cumulative impact of the reform;
- the impact of the reform at risk category level; or
- sensitivity analysis within each risk category (on the impact of individual policy reforms / alternative scenarios).

460. Each type of sample was determined applying specific data quality-based inclusion criteria.

461. As a general principle:

- institutions not included in the cumulative impact analysis sample may still have been included in one or more risk-specific chapters if they met the inclusion criteria for those risk-specific analyses;
- institutions excluded from a risk-specific chapter (e.g. excluded from the operational risk chapter) may still have been included in the cumulative impact analysis sample if they met the criteria for inclusion in the cumulative analysis, subject to adjustments for the missing risk-specific data (see next section);
- institutions excluded from a given risk-specific chapter were also excluded from all sensitivity exercises related to that risk category (e.g. institutions excluded from the IRB chapter as a result of failing the IRB-specific inclusion criteria were also excluded from the marginal impact analysis of all IRB reforms and IRB alternative scenarios).

462. Institutions were included in the cumulative analysis if they:

- reported leverage ratio data;
- reported Credit Risk data (SA or IRB) of sufficient quality;[87]
- reported total RWA under the revised framework;
- were not identified as outliers in terms of total RWA impact of the reform.[88]

463. Institutions were included in any given risk-specific chapter if they:

- reported information of sufficient quality (footnote 87) for the specific risk type;
- reported risk-specific RWA under the current and final Basel III framework;
- were not identified as outliers in terms of RWA impact at the risk level. (footnote 88).

[87] Data are considered of good quality if the data were not flagged as problematic by national competent authorities and the data reported under the current framework are sufficiently in line with the data reported in the supervisory reporting templates (COREP).

[88] The EBA considers that the impact result (difference between the RWA under the revised and current framework) is an outlier result if the institution fails the interquartile test. An instituion fails the interquartile text if the impact results are higher than the third quartile plus 3 times the interquartile range or lower than the first quartile minus 3 times the interquartile range. If the EBA considers one institution an outlier, the competent authority of the institution's country of origin has been contacted to confirm if the institution should be kept in the analysis.

464. Institutions were included in any given sensitivity sample (on the marginal impact of individual reforms or alternative scenarios) if:

- they reported both current and revised RWA relevant to the marginal analysis or alternative scenario under consideration, the RWA are not inconsistent[89] and the resulting impact is not identified as an outlier value;[90]
- they reported the RWA under the alternative scenario that is being analysed; the information should have been reported with enough data quality for the data not to be considered inconsistent (footnote 89) or outliers (footnote 90);.
- the difference between the revised RWA and the RWA under an alternative scenario does not fail the interquartile test as defined by the EBA (footnote 88).

465. Additional criteria for exclusion were applied for some specific sensitivity analyses, where the direction of the impact was considered wrong or where there were inconsistencies between the same data reported in different sections of the QIS template.

466. In the credit risk section, where marginal impact analysis or scenario analysis was carried out at the level of all exposure classes and not at the level of total (SA or IRB) RWA or for certain exposure classes only, institutions were excluded if they did not meet the inclusion criteria for more than 25% of their total SA or IRB RWA (depending on the type of marginal analysis under consideration).

Data quality adjustments

467. The inclusion criteria described above aim to identify those banks that did not submit as many as necessary to allow computing meaningful and representative results, and should therefore be excluded.

468. The EBA also identified data quality issues for which exclusion from the samples was deemed disproportionate. In such cases, instead of excluding the institution from the sample, an adjustment was made to impose zero impact for the specific analysis under consideration(equalising revised RWA to current RWA or equalising the RWA under an alternative scenario to the revised RWA) for the risk category, credit risk regulatory portfolio or scenario under consideration in relation to which the data quality issue was identified.

469. In particular:

- For institutions included in the cumulative analysis that did not report non-modellable RWA (necessary for the calculation of the output floor), non-

[89] Data are considered inconsistent in the case of risk-specific analysis if an institution reported current RWA greater than zero and revised RWA equal to zero or vice versa. Data are considered inconsistent in the case of scenario analysis within a given risk category, if an institution reported revised RWA greater than zero and RWA under the specific scenario equal to zero.

[90] As defined by the EBA in footnote 88 and after contrasting only if confirmed by the relevant national competent authority.

modellable RWA were assumed to equal the institution's RWA calculated under internal models.

- For institutions included in the cumulative analysis that were excluded from a risk-specific chapter, an assumption of zero impact was made for the specific risk under consideration (revised RWA were assumed to be equal to current RWA for the risk under consideration).

- In the case of risk-specific impact analysis, where RWA at the level of regulatory approach or credit risk exposure class were found to be inconsistent (footnote 89) or an outlier value,[91] an assumption of zero impact was made (revised RWA were assumed to be equal to current RWA for the approach/portfolio under consideration).

- In the case of marginal impact analysis and scenario analysis within a given risk category in the credit risk section, where RWA data at portfolio level were found to be inconsistent (footnote 89) or an outlier value (footnote 91) as defined in footnote 88, an assumption of zero impact was made (alternative scenario RWA were assumed to be equal to revised RWA for the approach/portfolio under consideration). Where the RWA found to be inconsistent or outlier values represented 25% or more of the institution's total RWA, the institution was excluded from the marginal impact/scenario analysis (see exclusion criteria).

[91] Outliers are treated only if they are material (RWA > 1% of the portfolio) and after confirmation by the national competent authority.

Annex 2: Additional results

Impact of the central reform scenario net of EU-specific CET1 buffers and Pillar 2 requirements

470. As explained in Chapter 3, the impact of the reform in terms of MRC takes into account all capital requirements applicable in the EU, i.e. Pillar 1 minima, Pillar 2 requirements and the combined CET1 buffer requirement. From a methodological perspective this represents a novely with respect to the EBA's previously published Basel III monitoring analyses.

471. For the purposes of comparability with previously published analyses on the impact of the Basel III standards, this section reports impact results computed taking into account only Pillar 1 minima, the capital conservation buffer and the G-SII buffer (where applicable).

Table 76 Percentage change in T1 MRC (relative to current T1 MRC), EU average results, only Pillar 1 minima, the capital conservation buffer and the G-SII buffer

Bank size	Δ SA	Δ IRB	Δ CCP	Δ SEC	Δ MKT	Δ OP	Δ CVA	Δ LR	Δ OF	Δ Total
All banks	**2.6**	**2.6**	**0.0**	**0.6**	**2.4**	**3.3**	**3.6**	**-0.7**	**3.9**	**18.4**
Large	2.2	2.7	0.0	0.6	2.5	3.5	3.8	-0.6	4.0	18.7
of which: G-SIIs	1.7	3.3	-0.1	1.1	4.1	5.5	5.0	3.3	5.0	28.9
of which: O-SIIs	2.2	1.4	0.1	0.3	1.4	2.0	3.2	-3.9	3.6	10.3
Medium	10.3	0.2	0.0	0.0	0.7	0.3	0.4	-1.8	0.5	10.6
Small	11.1	0.0	0.3	-2.0	0.0	-3.5	0.4	0.8	0.0	7.1

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Notes: Based on a sample of 189 banks: Large (104), of which G-SII (8), of which O-SII (67); Medium (61); Small (24). SA, standardised approach to credit risk; IRB, internal rating-based approach to credit risk; CCP, central counterparty; SEC, securitisation; MKT, market risk; OP, operational risk; CVA, credit valuation adjustment; LR, leverage ratio; OF, output floor.

Table 77 Capital ratios and shortfalls, by bank size , , only Pillar 1 minima, the capital conservation buffer and the G-SII buffer

Bank size	CET1 capital			Tier 1 capital			Total capital		
	Current ratio (%)	Revised ratio (%)	Shortfall (EUR bn)	Current ratio (%)	Revised ratio (%)	Shortfall (EUR bn)	Current ratio (%)	Revised ratio (%)	Shortfall (EUR bn)
All banks	**14.4**	**11.5**	**9.9**	**15.3**	**12.3**	**24.7**	**17.9**	**14.3**	**39.9**
Large	14.2	11.4	9.9	15.2	12.2	24.4	17.8	14.2	39.5
of which: G-SIIs	12.7	9.9	7.1	13.8	10.8	19.3	16.2	12.7	33.4
of which: O-SIIs	15.4	12.5	0.3	16.3	13.2	1.2	19.2	15.6	1.3
Medium	17.4	15.2	0.0	17.6	15.4	0.3	19.0	16.7	0.3
Small	17.0	16.0	0.0	17.2	16.1	0.0	18.3	17.1	0.0

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Notes: Based on a sample of 189 banks: Large (104), of which G-SII (8), of which O-SII (67); Medium (61); Small (24). Tier 1 and total capital shortfalls include the shortfall incurred by institutions constrained by the leverage ratio in the revised framework.

Table 78 Number and percentage RWA of standardised institutions constrained by each regulatory metric, , only Pillar 1 minima, the capital conservation buffer and the G-SII buffer

Scenario	Number of institutions		Total	% of total RWA	
	RWs	LR		RWs	LR
Baseline	83	27	110	78	22
Central scenario	85	25		80	20

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Notes: Based on a sample of 110 banks.

Table 79 Number and percentage RWA of internal model institutions constrained by each regulatory metric, only Pillar 1 minima, the capital conservation buffer and the G-SII buffer

Scenario	Number of institutions			Total	% of total RWA		
	RWs	LR	OF		RWs	LR	OF
Baseline	39	40	0	79	64	36	0
Central scenario	31	29	19		29	28	43

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Notes: Based on a sample of 79 banks.

Alternative Basel III implementation scenarios

National discretion in operational risk: ILM = 1 for institutions of buckets 2 and 3

472. The impact results shown in this section relate to a Basel III implementation scenario that adopts the national discretion of setting to 1 the ILM factor in the calculation of the operational risk requirement for institutions of BI bucket 2 and 3.

Table 80 Percentage change in T1 MRC (relative to current T1 MRC), EU average results, ILM=1

Bank size	Δ SA	Δ IRB	Δ CCP	Δ SEC	Δ MKT	Δ OP	Δ CVA	Δ LR	Δ OF	Δ Total
All banks	**2.7**	**2.7**	**0.1**	**0.6**	**2.5**	**1.6**	**3.9**	**-0.5**	**9.5**	**23.2**
Large	2.3	2.8	0.1	0.7	2.6	1.7	4.1	-0.5	9.9	23.7
of which: G-SIIs	1.7	3.5	-0.1	1.2	4.2	1.8	5.1	0.0	8.4	25.8
of which: O-SIIs	2.3	1.7	0.2	0.3	1.6	1.7	3.7	-0.6	12.2	23.3
Medium	9.7	0.1	0.0	0.0	0.9	0.8	0.5	-1.1	0.9	11.8
Small	10.7	0.0	0.2	-1.9	0.0	-3.7	0.3	-0.1	0.0	5.5

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Notes: Based on a sample of 189 banks: Large (104), of which G-SII (8), of which O-SII (67); Medium (61); Small (24). SA, standardised approach to credit risk; IRB, internal rating-based approach to credit risk; CCP, central counterparty; SEC, securitisation; MKT, market risk; OP, operational risk; CVA, credit valuation adjustment; LR, leverage ratio; OF, output floor.

Table 81 Capital ratios and shortfalls, by bank size, ILM = 1

Bank size	CET1 capital			Tier 1 capital			Total capital		
	Current ratio (%)	Revised ratio (%)	Shortfall (EUR bn)	Current ratio (%)	Revised ratio (%)	Shortfall (EUR bn)	Current ratio (%)	Revised ratio (%)	Shortfall (EUR bn)
All banks	**14.4**	**11.7**	**82.5**	**15.3**	**12.4**	**115.9**	**17.9**	**14.5**	**122.8**
Large	14.2	11.5	82.4	15.2	12.3	115.0	17.8	14.4	121.7
of which: G-SIIs	12.7	10.2	44.3	13.8	11.0	57.9	16.2	12.9	69.9
of which: O-SIIs	15.4	12.5	34.2	16.3	13.3	51.0	19.2	15.6	44.4
Medium	17.3	15.1	0.1	17.5	15.3	0.9	18.9	16.5	1.0
Small	17.0	16.0	0.0	17.2	16.1	0.0	18.3	17.1	0.1

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Notes: Based on a sample of 189 banks: Large (104), of which G-SII (8), of which O-SII (67); Medium (61); Small (24). Tier 1 and total capital shortfalls include the shortfall incurred by institutions constrained by the leverage ratio in the revised framework.

Table 82 Number and percentage RWA of standardised institutions constrained by each regulatory metric, ILM = 1

Scenario	Number of institutions		Total	% of total RWA	
	RWs	LR		RWs	LR
Baseline	88	22	110	85.9	14.1
Central scenario	93	17		92.1	7.9

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 110 banks.

Table 83 Number and percentage RWA of internal model institutions constrained by each regulatory metric, ILM = 1

Scenario	Number of institutions			Total	% of total RWA		
	RWs	LR	OF		RWs	LR	OF
Baseline	63	16	0	79	96.4	3.6	0.0
Central scenario	34	5	40		29.0	0.4	70.6

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 79 banks.

CVA exemptions: implementing the Basel III framework including current EU CVA exemptions

Table 84 Percentage change in T1 MRC (relative to current T1 MRC), EU average results, EU CVA exemptions

Bank size	Δ SA	Δ IRB	Δ CCP	Δ SEC	Δ MKT	Δ OP	Δ CVA	Δ LR	Δ OF	Δ Total
All banks	**2.7**	**2.7**	**0.1**	**0.6**	**2.5**	**3.3**	**1.1**	**-0.4**	**9.5**	**22.0**
Large	2.3	2.8	0.1	0.7	2.6	3.4	1.1	-0.4	9.9	22.5
of which: G-SIIs	1.7	3.5	-0.1	1.2	4.2	5.5	1.4	0.0	8.2	25.6
of which: O-SIIs	2.3	1.7	0.2	0.3	1.6	2.1	1.1	-0.4	12.4	21.3
Medium	9.7	0.1	0.0	0.0	0.9	0.3	0.1	-1.1	0.9	10.9
Small	10.7	0.0	0.2	-1.9	0.0	-3.7	0.2	0.1	0.0	5.5

Sources: EBA 2018-Q2 QIS data and EBA calculations.

Notes: Based on a sample of 189 banks: Large (104), of which G-SII (8), of which O-SII (67); Medium (61); Small (24). SA, standardised approach to credit risk; IRB, internal rating-based approach to credit risk; CCP, central counterparty; SEC, securitisation; MKT, market risk; OP, operational risk; CVA, credit valuation adjustment; LR, leverage ratio; OF, output floor.

Table 85 Capital ratios and shortfalls, by bank size, EU CVA exemptions

Bank size	CET1 capital			Tier 1 capital			Total capital		
	Current ratio (%)	Revised ratio (%)	Shortfall (EUR bn)	Current ratio (%)	Revised ratio (%)	Shortfall (EUR bn)	Current ratio (%)	Revised ratio (%)	Shortfall (EUR bn)
All banks	**14.4**	**11.8**	**79.3**	**15.3**	**12.5**	**111.7**	**17.9**	**14.6**	**116.9**
Large	14.2	11.6	79.3	15.2	12.4	110.9	17.8	14.5	115.9
of which: G-SIIs	12.7	10.2	44.7	13.8	11.1	57.6	16.2	13.0	69.9
of which: O-SIIs	15.4	12.7	30.6	16.3	13.5	47.1	19.2	15.9	38.6
Medium	17.3	15.2	0.1	17.5	15.4	0.8	18.9	16.6	0.9
Small	17.0	16.0	0.0	17.2	16.1	0.0	18.3	17.2	0.1

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Notes: Based on a sample of 189 banks: Large (104), of which G-SII (8), of which O-SII (67); Medium (61); Small (24). Tier 1 and total capital shortfalls include the shortfall incurred by institutions constrained by the leverage ratio in the revised framework.

Table 86 Number and percentage RWA of standardised institutions constrained by each regulatory metric, EU CVA exemptions

Scenario	Number of institutions		Total	% of total RWA	
	RWs	LR		RWs	LR
Baseline	88	22	110	85.9	14.1
Central scenario	93	17		92.1	7.9

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 110 banks.

Table 87 Number and percentage RWA of internal model institutions constrained by each regulatory metric, EU CVA exemptions

Scenario	Number of institutions			Total	% of total RWA		
	RWs	LR	OF		RWs	LR	OF
Baseline	63	16	0	79	96.4	3.6	0.0
Central scenario	33	5	41		28.4	0.4	71.2

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 79 banks.

SME supporting factor: implementing the revised Basel III framework augmented with a CRR2 type of SME supporting factor

Table 88 Percentage change in T1 MRC (relative to current T1 MRC), EU average results, SME supporting factor

Bank size	Δ SA	Δ IRB	Δ CCP	Δ SEC	Δ MKT	Δ OP	Δ CVA	Δ LR	Δ OF	Δ Total
All banks	**2.0**	**1.8**	**0.1**	**0.6**	**2.5**	**3.3**	**3.9**	**-0.4**	**9.2**	**22.9**
Large	1.7	1.8	0.1	0.7	2.6	3.4	4.1	-0.4	9.5	23.5
of which: G-SIIs	1.1	2.9	-0.1	1.2	4.2	5.5	5.1	0.0	7.5	27.4
of which: O-SIIs	1.8	0.3	0.2	0.3	1.6	2.1	3.7	-0.4	12.3	21.9
Medium	8.4	0.1	0.0	0.0	0.9	0.3	0.5	-1.0	0.9	10.1
Small	9.7	0.0	0.2	-1.9	0.0	-3.7	0.3	0.0	0.0	4.7

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Notes: Based on a sample of 189 banks: Large (104), of which G-SII (8), of which O-SII (67); Medium (61); Small (24). SA, standardised approach to credit risk; IRB, internal rating-based approach to credit risk; CCP, central counterparty; SEC, securitisation; MKT, market risk; OP, operational risk; CVA, credit valuation adjustment; LR, leverage ratio; OF, output floor.

Table 89 Capital ratios and shortfalls, by bank size, SME supporting factor

Bank size	CET1 capital			T1 capital			TC capital		
	Current ratio (%)	Revised ratio (%)	Shortfall (EUR bn)	Current ratio (%)	Revised ratio (%)	Shortfall (EUR bn)	Current ratio (%)	Revised ratio (%)	Shortfall (EUR bn)
All banks	**14.4**	**11.7**	**87.0**	**15.3**	**12.5**	**120.3**	**17.9**	**14.5**	**128.3**
Large	14.2	11.5	87.0	15.2	12.3	119.6	17.8	14.4	127.4
of which: G-SIIs	12.7	10.0	51.3	13.8	10.9	65.3	16.2	12.8	79.0
of which: O-SIIs	15.4	12.6	31.7	16.3	13.4	48.5	19.2	15.8	41.5
Medium	17.3	15.4	0.0	17.5	15.6	0.7	18.9	16.8	0.8
Small	17.0	16.1	0.0	17.2	16.2	0.0	18.3	17.3	0.1

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Notes: Based on a sample of 189 banks: Large (104), of which G-SII (8), of which O-SII (67); Medium (61); Small (24). Tier 1 and total capital shortfalls include the shortfall incurred by institutions constrained by the leverage ratio in the revised framework.

Table 90 Number and percentage RWA of standardised institutions constrained by each regulatory metric, SME supporting factor

Scenario	Number of institutions		Total	% of Total RWA	
	RWs	LR		RWs	LR
Baseline	88	22	110	85.9	14.1
Central scenario	92	18		88.2	11.8

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 110 banks.

Table 91 Number and percentage RWA of internal model institutions constrained by each regulatory metric, SME supporting factor

Scenario	Number of institutions			Total	% of Total RWA		
	RWs	LR	OF		RWs	LR	OF
Baseline	63	16	0	79	96.4	3.6	0.0
Central scenario	34	5	40		33.3	0.4	66.3

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 79 banks.

FRTB 2019: implementing the revised Basel III framework proxying for the 2019 FRTB standards

473. The impact results shown in this section relate to a Basel III implementation scenario that proxies the 2019 fundamental review of the trading book (FRTB) standards.

Table 92 Percentage change in T1 MRC (relative to current T1 MRC), EU average results, 2019 FRTB proxy

Bank size	Δ SA	Δ IRB	Δ CCP	Δ SEC	Δ MKT	Δ OP	Δ CVA	Δ LR	Δ OF	Δ Total
All banks	**2.7**	**2.7**	**0.1**	**0.6**	**1.4**	**3.3**	**3.9**	**-0.5**	**9.7**	**23.9**
Large	2.3	2.8	0.1	0.7	1.5	3.4	4.1	-0.5	10.1	24.5
of which: G-SIIs	1.7	3.5	-0.1	1.2	2.1	5.5	5.1	0.0	9.0	27.9
of which: O-SIIs	2.3	1.7	0.2	0.3	1.1	2.1	3.7	-0.5	12.2	23.1
Medium	9.7	0.1	0.0	0.0	0.2	0.3	0.5	-1.1	0.9	10.6
Small	10.7	0.0	0.2	-1.9	0.0	-3.7	0.3	-0.1	0.0	5.5

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Notes: Based on a sample of 189 banks: Large (104), of which G-SII (8), of which O-SII (67); Medium (61); Small (24). SA, standardised approach to credit risk; IRB, internal rating-based approach to credit risk; CCP, central counterparty; SEC, securitisation; MKT, market risk; OP, operational risk; CVA, credit valuation adjustment; LR, leverage ratio; OF, output floor.

Table 93 Capital ratios and shortfalls, by bank size, 2019 FRTB proxy

Bank size	CET1 capital			T1 capital			TC capital		
	Current ratio (%)	Revised ratio (%)	Shortfall (EUR bn)	Current ratio (%)	Revised ratio (%)	Shortfall (EUR bn)	Current ratio (%)	Revised ratio (%)	Shortfall (EUR bn)
All banks	**14.4**	**11.6**	**88.0**	**15.3**	**12.4**	**123.7**	**17.9**	**14.4**	**130.9**
Large	14.2	11.4	88.0	15.2	12.2	122.9	17.8	14.3	129.9
of which: G-SIIs	12.7	10.0	51.2	13.8	10.9	66.2	16.2	12.7	79.5
of which: O-SIIs	15.4	12.5	32.8	16.3	13.3	50.5	19.2	15.6	42.8
Medium	17.3	15.2	0.1	17.5	15.4	0.8	18.9	16.7	0.9
Small	17.0	16.0	0.0	17.2	16.1	0.0	18.3	17.1	0.1

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Notes: Based on a sample of 189 banks: Large (104), of which G-SII (8), of which O-SII (67); Medium (61); Small (24). Tier 1 and total capital shortfalls include the shortfall incurred by institutions constrained by the leverage ratio in the revised framework.

Table 94 Number and percentage RWA of standardised institutions constrained by each regulatory metric, 2019 FRTB proxy

Scenario	Number of institutions		Total	% of Total RWA	
	RWs	LR		RWs	LR
Baseline	88	22	110	85.9	14.1
Central scenario	93	17		92.1	7.9

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 110 banks.

Table 95 Number and percentage RWA of internal model institutions constrained by each regulatory metric, 2019 FRTB proxy

Scenario	Number of institutions			Total	% of Total RWA		
	RWs	LR	OF		RWs	LR	OF
Baseline	63	16	0	79	96.4	3.6	0.0
Central scenario	34	5	40		28.9	0.4	70.7

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 79 banks.

Credit Risk SA

Credit risk SA: Percentage change in SA RWA for each exposure class, by sub-class and bank size

Table 96 Percentage change in SA RWA of exposures to sovereigns (relative to total current SA RWA), by sub-class and bank size

Bank size	MDBs	Other PSEs	PSEs treated as sovereigns	Sovereigns	Total sovereigns
All banks	**0.0**	**0.1**	**0.0**	**0.1**	**0.2**
Large	0.0	0.1	0.0	0.0	0.1
of which: G-SIIs	0.0	0.1	0.0	0.0	0.1
of which: O-SIIs	0.0	0.0	0.0	0.0	0.0
Medium	0.0	0.4	0.0	0.4	0.8
Small	0.0	0.0	0.5	2.1	2.5

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 181 banks: Large (98), of which G-SIIs (7), of which O-SIIs (61); Medium (59); Small (24).

Table 97 Percentage change in SA RWA of exposures to banks (relative to total current SA RWA), by sub-class and bank size

Bank size	IPS	Rated exposures	Unrated exposures	Total banks
All banks	**0.0**	**-0.1**	**1.0**	**0.9**
Large	0.0	0.0	1.0	0.9
of which: G-SIIs	0.0	0.0	0.6	0.7
of which: O-SIIs	0.0	-0.2	1.4	1.2
Medium	0.0	-0.3	0.9	0.7
Small	0.0	0.0	0.4	0.3

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 181 banks: Large (98), of which G-SIIs (7), of which O-SIIs (61); Medium (59); Small (24).

Table 98 Percentage change in SA RWA of exposures to covered bonds (relative to total current SA RWA), by sub-class and bank size

Bank size	Rated exposures	Unrated exposures	Total covered bonds
All banks	**0.0**	**0.1**	**0.0**
Large	0.0	0.1	0.0
of which: G-SIIs	0.0	0.0	0.0
of which: O-SIIs	-0.1	0.1	0.1
Medium	0.0	0.1	0.1
Small	0.0	0.0	0.0

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 119 banks (only banks reporting "full template")

Table 99 Percentage change in SA RWA of exposures to corporates, excluding SMEs (relative to total current SA RWA), by sub-class and bank size

Bank size	Rated exposures	Unrated exposures	Total corporate (excluding SME)
All banks	**0.1**	**0.6**	**0.7**
Large	0.0	0.8	0.8
of which: G-SIIs	0.2	0.4	0.6
of which: O-SIIs	0.0	1.3	1.3
Medium	0.8	-1.0	-0.2
Small	-0.1	-2.1	-2.2

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 181 banks: Large (98), of which G-SIIs (7), of which O-SIIs (61); Medium (59); Small (24).

Table 100 Percentage change in SA RWA of exposures to corporate SMEs (relative to total current SA RWA), by sub-class and bank size

Bank size	Rated exposures	Unrated exposures	Total corporate SME
All banks	**0.0**	**-0.3**	**-0.4**
Large	0.0	-0.3	-0.4
of which: G-SIIs	0.0	-0.1	-0.4
of which: O-SIIs	0.0	-0.3	-0.5
Medium	0.0	-0.7	-0.7
Small	0.0	-0.2	-0.1

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 181 banks: Large (98), of which G-SIIs (7), of which O-SIIs (61); Medium (59); Small (24).

Table 101 Percentage change in SA RWA of specialised lending exposures (relative to total current SA RWA), by sub-class and bank size

Bank size	Commodity finance	Object finance	Project finance	Rated exposures	Total specialised lending
All banks	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Large	0.0	0.0	0.0	0.0	0.0
of which: G-SIIs	0.0	0.0	0.1	0.0	0.1
of which: O-SIIs	0.0	0.0	0.0	0.0	0.0
Medium	0.0	0.0	0.1	0.0	0.1
Small	0.0	0.0	-0.1	0.0	-0.1

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 181 banks: Large (98), of which G-SIIs (7), of which O-SIIs (61); Medium (59); Small (24).

Table 102 Percentage change in SA RWA of specialised lending exposures (relative to total current SA RWA), by sub-class, project finance phase and bank size

Bank size	Commodity finance	Object finance	Project finance: operational	Project finance: high quality	Project finance: pre-operational	Rated exposures	Total specialised lending
All banks	**0.0**	**0.0**	**0.0**	**0.0**	**0.1**	**0.0**	**0.0**
Large	0.0	0.0	0.0	0.0	0.1	0.0	0.1
of which: G-SIIs	0.0	0.0	0.0	0.0	0.0	0.0	0.0
of which: O-SIIs	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Medium	0.0	0.0	0.0	0.0	0.3	0.0	0.3
Small	0.0	0.0	0.0	0.0	0.1	0.0	0.0

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 119 banks (only banks reporting “full template”)

Table 103 Percentage change in SA RWA of equity exposures (relative to total current SA RWA), by sub-class and bank size

Bank size	Exposures to certain legislative programmes	Other	Speculative unlisted	Total equity
All banks	**0.0**	**2.6**	**0.2**	**2.8**
Large	0.0	2.1	0.2	2.3
of which: G-SIIs	0.0	0.5	0.2	0.7
of which: O-SIIs	0.0	2.6	0.2	2.7
Medium	0.0	6.9	0.7	7.5
Small	0.0	2.0	0.0	2.0

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 181 banks: Large (98), of which G-SIIs (7), of which O-SIIs (61); Medium (59); Small (24).

Table 104 Percentage change in SA RWA of retail exposures (relative to total current SA RWA), by sub-class and bank size

Bank size	Other retail	Regulatory retail – non-transactors	Regulatory retail – transactors	Total retail
All banks	**0.1**	**1.7**	**-0.1**	**1.7**
Large	0.1	1.8	-0.1	1.8
of which: G-SIIs	0.0	2.1	-0.3	1.8
of which: O-SIIs	0.2	1.6	0.0	1.7
Medium	0.0	1.4	-0.1	1.2
Small	0.6	1.6	0.6[92]	2.8

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 181 banks: Large (98), of which G-SIIs (7), of which O-SIIs (61); Medium (59); Small (24).

Table 105 Percentage change in SA RWA of exposures secured by real estate (relative to total current SA RWA), by sub-class and bank size

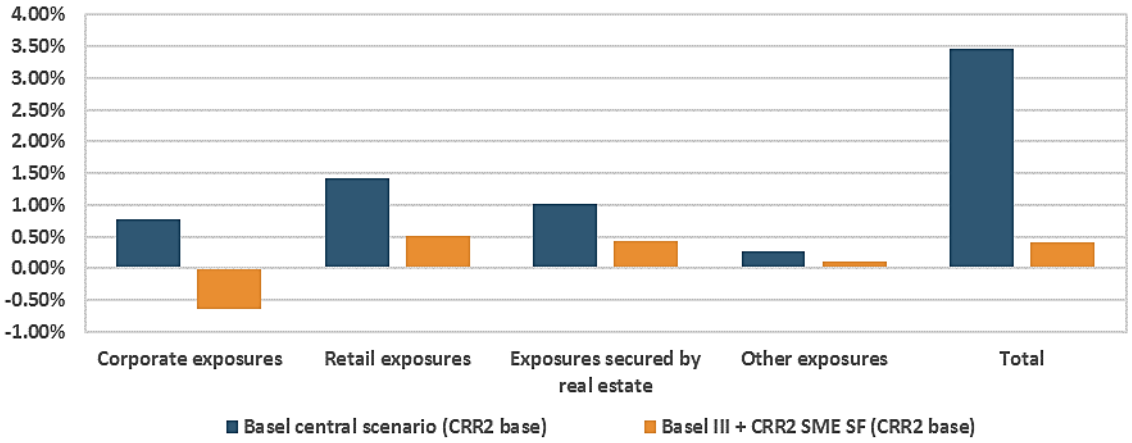
Bank size	General commercial real estate	General residential real estate	Income producing commercial real estate	Income producing residential real estate	Land acquisition, development and construction	Exposures secured by real estate
All banks	**0.6**	**-0.5**	**0.4**	**0.1**	**0.5**	**1.1**
Large	0.6	-0.5	0.4	0.1	0.5	1.0
of which: G-SIIs	0.7	0.1	0.2	0.1	0.7	1.9
of which: O-SIIs	0.3	-0.8	0.6	0.1	0.3	0.5
Medium	1.0	-0.2	0.2	0.6	0.9	2.4
Small	0.5	-0.9	0.0	0.3	3.9	4.0

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 181 banks: Large (98), of which G-SIIs (7), of which O-SIIs (61); Medium (59); Small (24).

[92] QIS findings show a positive impact for the Retail category of transactor for small banks which however only stems from a very limited number of institutions and should therefore be interpretad with caution.

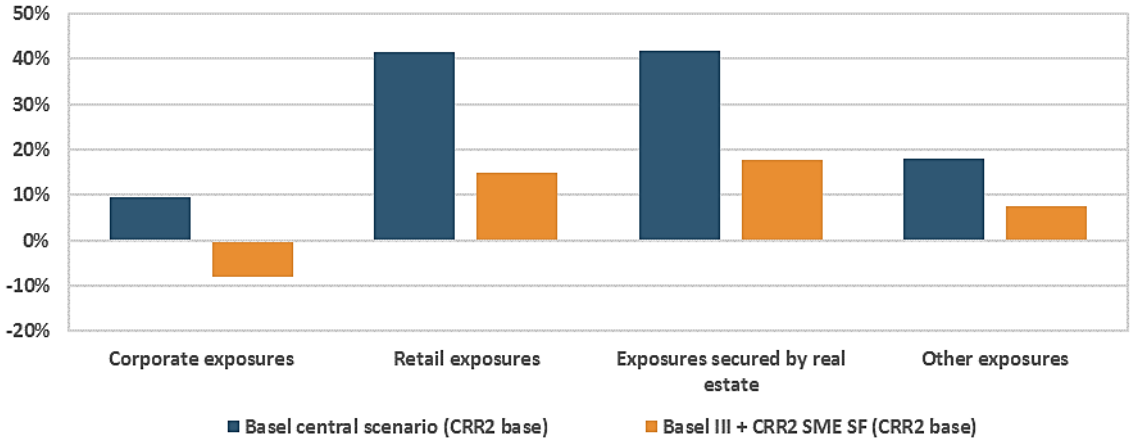
Credit risk SA: SME supporting factors

Figure 101 Percentage change in SA RWA from CRR2 baseline scenario due to change in RWA of exposures (relative to total current SA RWA), by scenario



Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 94 banks.

Figure 102 Percentage change in exposure class SA RWA from CRR2 baseline scenario due to change in RWA of exposures (relative to current exposure class RWA), by scenario



Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 94 banks.

Credit Risk IRB

Credit risk IRB: Percentage change in IRB RWA for each exposure class, by sub-class and bank size

Table 106 Percentage change in IRB RWA of exposures to corporates (relative to total current IRB RWA), by sub-class and bank size

Bank size	Financial institutions treated as corporates	Corporates with revenues > EUR 500 m	Corporates with revenues ≤ EUR 500 m	SME treated as corporate	Total corporates (except SL)
All banks	**0.6**	**0.5**	**0.2**	**0.7**	**1.9**
Large	0.6	0.5	0.2	0.7	1.9
of which: G-SIIs	1.2	0.7	0.4	0.5	2.8
of which: O-SIIs	0.1	0.2	0.0	0.9	1.1
Medium	0.0	1.5	0.6	-0.5	1.6

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Notes Based on a sample of 87 banks: Large (62), of which G-SIIs (8), of which O-SIIs (33); Medium (13).

Table 107 Percentage change in IRB RWA of exposures to retail and corporate SMEs (relative to total current IRB RWA), by sub-class and bank size

Bank size	Other retail: secured SME	Other retail: unsecured SME	Corporate SME	Total SME
All banks	**0.2**	**0.7**	**0.7**	**1.5**
Large	0.2	0.7	0.7	1.6
of which: G-SIIs	0.2	0.8	0.5	1.5
of which: O-SIIs	0.1	0.6	0.9	1.6
Medium	-0.1	0.2	-0.5	-0.5

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 87 banks: Large (62), of which G-SIIs (8), of which O-SIIs (33); Medium (13).

Table 108 Percentage change in IRB RWA of specialised lending exposures, excluding slotting approach (relative to total current IRB RWA), by sub-class and bank size

Bank size	Commodities finance	High-volatility commercial real estate	Income-producing real estate	Object finance	Project finance	Total specialised lending
All banks	**0.0**	**0.0**	**0.4**	**0.2**	**0.4**	**1.0**
Large	0.0	0.0	0.4	0.2	0.4	1.0
of which: G-SIIs	0.1	0.0	0.6	0.5	0.6	1.7
of which: O-SIIs	0.0	0.1	0.0	-0.1	0.2	0.2
Medium	0.0	0.3	-0.2	0.3	0.6	1.1

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 87 banks: Large (62), of which G-SIIs (8), of which O-SIIs (33); Medium (13).

Table 109 Percentage change in IRB RWA of specialised lending exposures, slotting approach (relative to total current IRB RWA), by sub-class and bank size

Bank size	Commodities finance	High-volatility commercial real estate	Income-producing real estate	Object finance	Project finance	Total specialised lending
All banks	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Large	0.0	0.0	0.0	0.0	0.0	0.0
of which: G-SIIs	0.0	0.0	0.0	0.0	0.0	0.0
of which: O-SIIs	0.0	0.0	0.0	0.0	-0.1	-0.1
Medium	0.0	0.0	0.0	0.0	0.0	0.0

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 87 banks: Large (62), of which G-SIIs (8), of which O-SIIs (33); Medium (13).

Table 110 Percentage change in IRB RWA of exposures to sovereigns (relative to total current IRB RWA), by sub-class and bank size

Bank size	MDB	PSE	RGLA	Other sovereign	Total sovereign
All banks	**0.0**	**0.0**	**0.0**	**0.0**	**-0.1**
Large	0.0	0.0	0.0	0.0	-0.1
of which: G-SIIs	0.0	0.0	0.0	-0.1	-0.1
of which: O-SIIs	0.0	0.0	0.0	0.0	-0.1
Medium	0.0	0.0	0.0	0.0	0.0

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 87 banks: Large (62), of which G-SIIs (8), of which O-SIIs (33); Medium (13).

Table 111 Percentage change in IRB RWA of exposures to banks (relative to total current IRB RWA), by sub-class and bank size

Bank size	MDB	PSE	RGLA	Other banks	Total banks
All banks	**0.0**	**0.1**	**0.2**	**2.7**	**3.1**
Large	0.0	0.1	0.2	2.7	3.1
of which: G-SIIs	0.0	0.1	0.1	2.4	2.7
of which: O-SIIs	0.0	0.2	0.4	0.9	1.4
Medium	0.0	0.0	0.0	-0.1	-0.1

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 87 banks: Large (62), of which G-SIIs (8), of which O-SIIs (33); Medium (13).

Table 112 Percentage change in IRB RWA of retail (relative to total current IRB RWA), by sub-class and bank size

Bank size	Retail residential real estate	Other retail: secured	Other retail: unsecured	QRRE: revolvers	QRRE: transactors	Total retail
All banks	**-0.3**	**0.2**	**1.0**	**0.1**	**0.0**	**1.0**
Large	-0.3	0.2	1.0	0.0	0.0	1.0
of which: G-SIIs	-0.4	0.3	1.0	0.0	0.0	0.9
of which: O-SIIs	-0.1	0.1	0.9	0.1	0.1	1.1
Medium	-1.3	0.0	1.7	0.7	0.0	1.0

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 87 banks: Large (62), of which G-SIIs (8), of which O-SIIs (33); Medium (13).

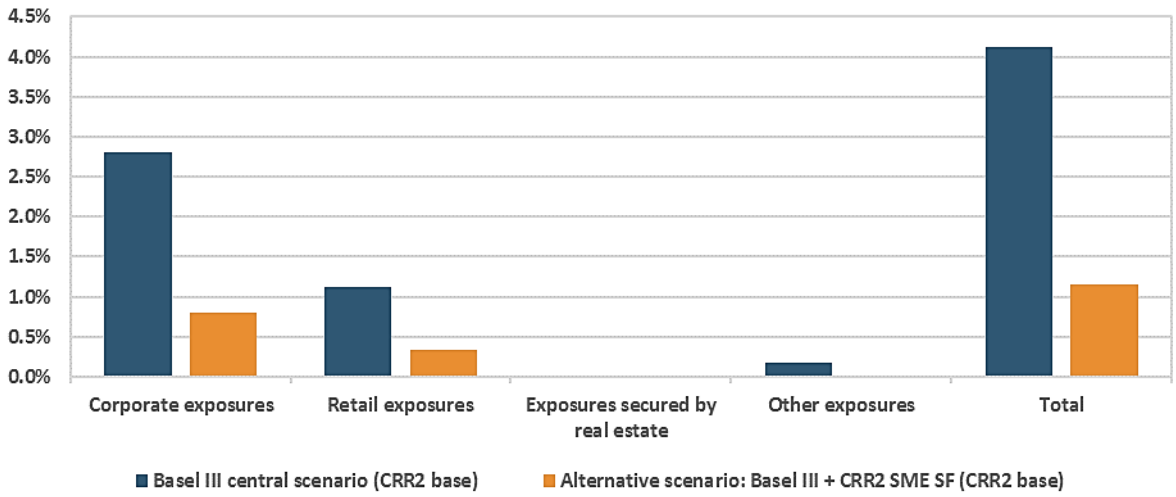
Table 113 Percentage change in IRB RWA of exposures to eligible purchased receivables (relative to total current IRB RWA), by sub-class and bank size

Bank size	Corporate	Retail	Total eligible purchased receivable
All banks	**0.0**	**0.0**	**0.0**
Large	0.0	0.0	0.0
of which: G-SIIs	0.0	0.0	0.0
of which: O-SIIs	0.0	0.0	0.0
Medium	0.0	0.0	0.0

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 87 banks: Large (62), of which G-SIIs (8), of which O-SIIs (33); Medium (13).

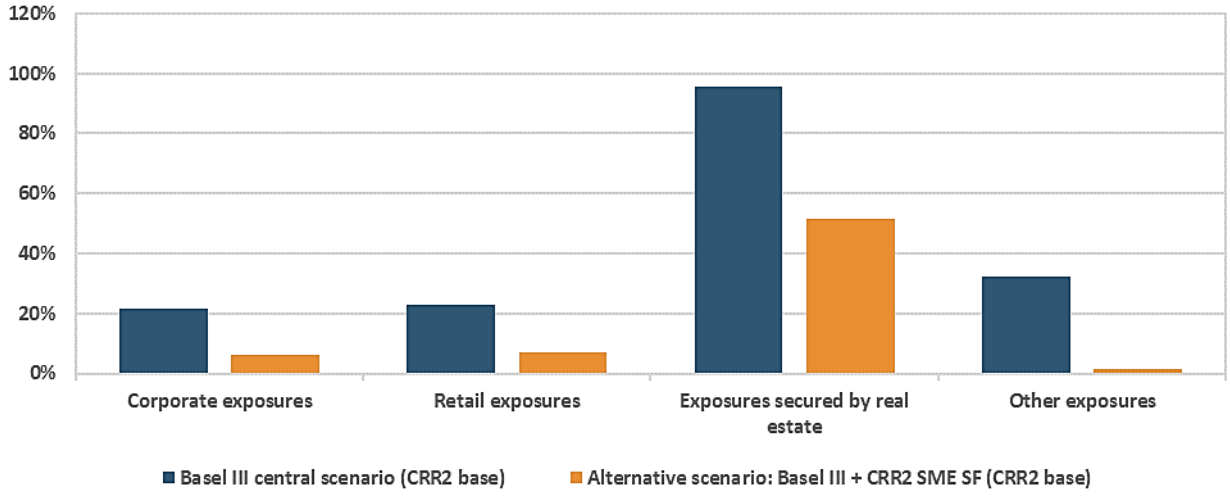
Credit risk IRB: SME supporting factors

Figure 103 Percentage change in IRB RWA from CRR2 baseline scenario due to change in RWA of exposures (relative to total current IRB RWA), by scenario



Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 47 banks.

Figure 104 Percentage change in exposure class IRB RWA from CRR2 baseline scenario due to change in RWA of exposures (relative to current exposure class RWA), by scenario

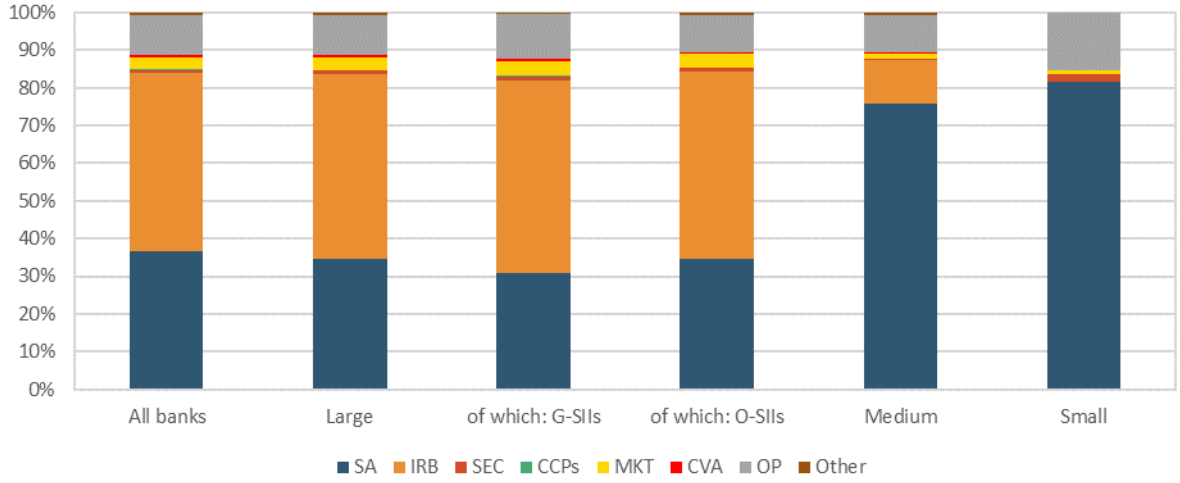


Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 47 banks.

Annex 3: Overview of current capital requirements

Overview of risk-weighted assets

Figure 105 Breakdown of risk-weighted assets by risk and bank size

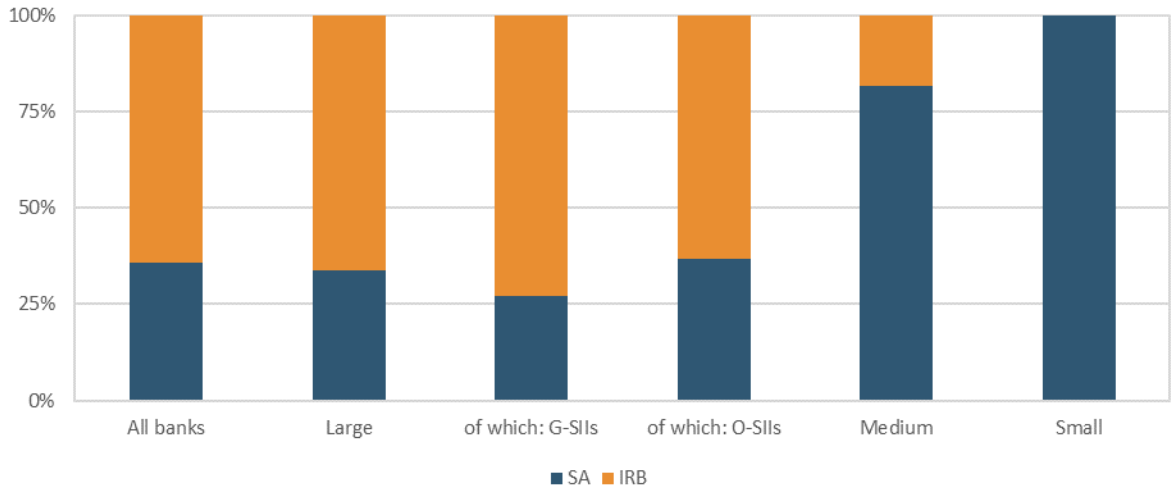


Sources: EBA 2018-Q2 QIS data and EBA calculations.
Notes: Based on a sample of 189 banks: Large (104), of which G-SIIs (8), of which O-SIIs (67); Medium (61); Small (24). SA, standardised approach to credit risk; IRB, internal rating-based approach to credit risk; SEC, securitisation; CCP, counterparty credit risk; MKT, market risk; OP, operational risk; CVA, credit valuation adjustment; OTH, other.

Credit risk

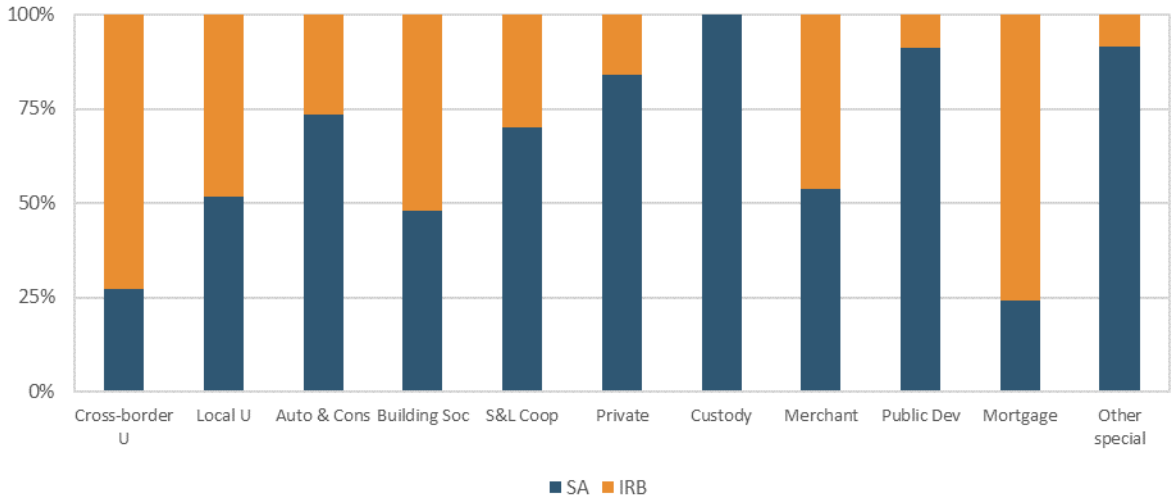
Use of SA and IRB in the current framework

Figure 106 Exposure value: SA versus IRB composition (% of total credit risk exposure value)



Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 189 banks: Large (104), of which G-SIIs (8), of which O-SIIs (67); Medium (61;, Small (24).

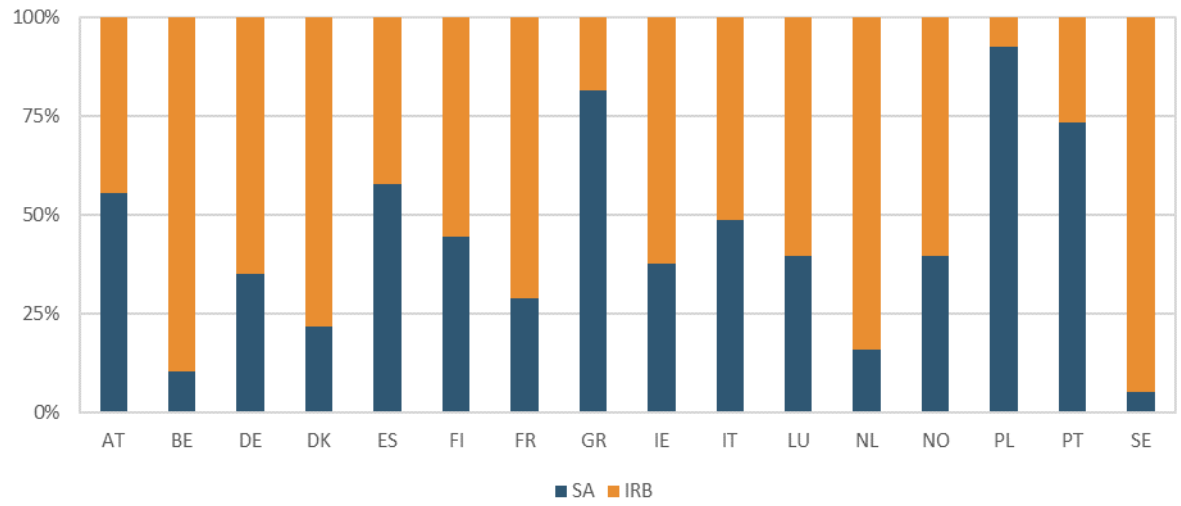
Figure 107 Exposure value: SA versus IRB composition (% of total credit risk exposure value)



Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 204 banks: Cross-border U (41), Local U (63), Auto & Cons (8), Building Soc (6), S&L Coop (34), Private (8), Custody (7), Merchant (5), Public Dev (10), Mortgage (8), Other special (11), Leasing* (2), , CCP* (1).

* Not shown in the chart because fewer than three entities in the cluster.

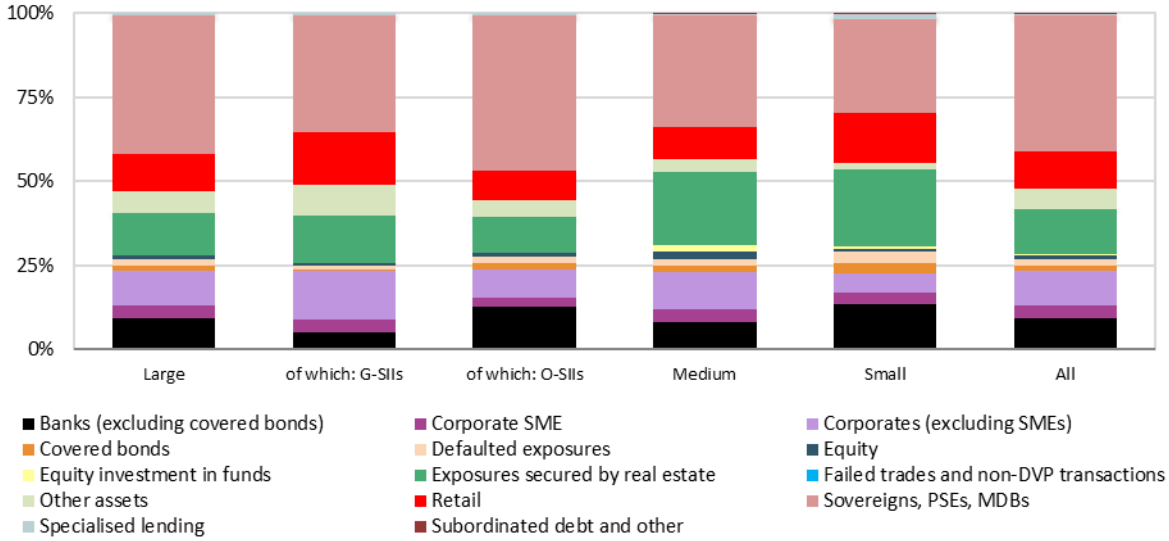
Figure 108 Breakdown of total credit risk exposure value, by approach and country (%)



Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 201 banks: AT (15), BE (8), DE (42), DK (8), EE* (2), ES (10), FI (5), FR (14), GR (4), HR* (2), HU* (1), IE (10), IT (24), LU (6), LV* (2), MT* (1), NL (12), NO (6), PL (12), PT(8), SE (11).
* Not shown in the chart because fewer than three entities in the cluster.Standardised approach to credit risk

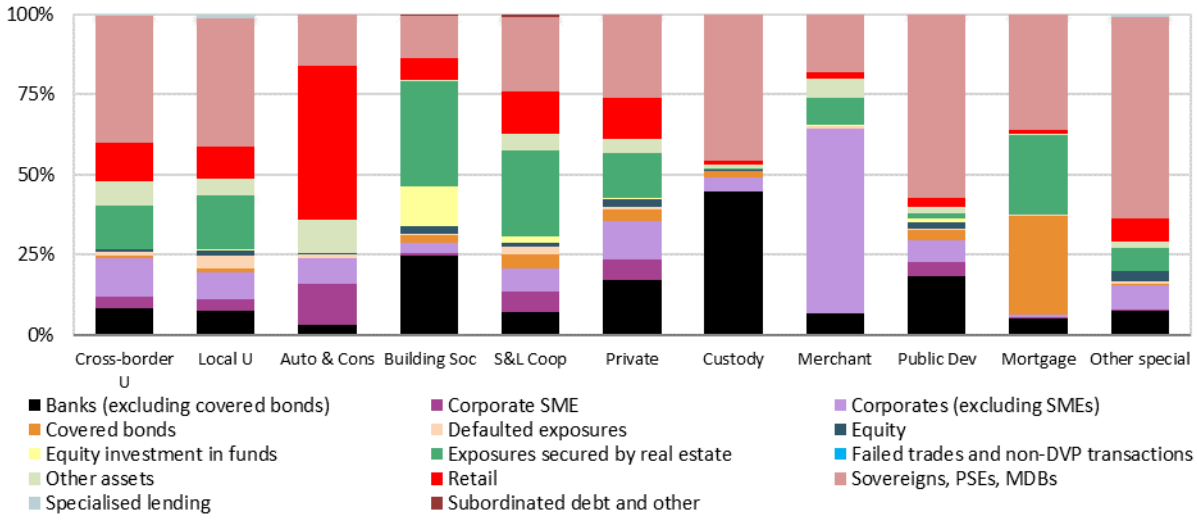
Composition of exposure value by exposure class and sub-exposure class

Figure 109 Breakdown of SA exposure value, by exposure class and bank size



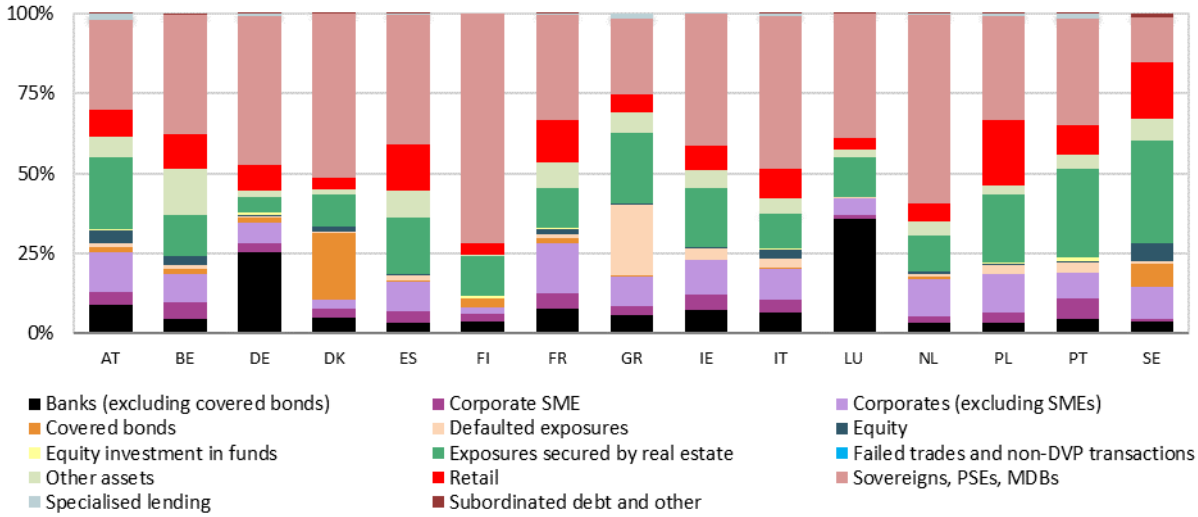
Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 181 banks: Large (98), of which G-SIIs (7), of which O-SIIs (61); Medium (59); Small (24).

Figure 110 Breakdown of SA exposure value, by exposure class and business model



Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 196 banks: Cross-border U (36), Local U (61), Auto & Cons (8), Building Soc (5), S&L Coop (34), Private (8), Custody (7), Merchant (5), Public Dev (10), Mortgage (8), Other special (11), Leasing* (2), CCP* (1).
* Not shown in the chart because fewer than three entities in the cluster.

Figure 111 Breakdown of SA exposure value, by exposure class and country



Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 195 banks: AT (14), BE (8), DE (39), DK (8), EE* (2), ES (10), FI (5), FR (14), GR (4), HR* (2), HU* (1), IE (10), IT (23), LU (5), LV* (2), MT* (1), NL (12), NO (5), PL (12), PT (8), SE (10).
* Not shown in the chart because fewer than three entities in the cluster.

Table 114 Breakdown of SA exposure value to sovereigns, by sub-class and bank size (%)

Bank size	MDBs	Other PSEs	PSEs treated as sovereigns	Sovereigns	Total sovereigns
All banks	**1.2**	**7.4**	**10.9**	**80.5**	**100.0**
Large	1.2	7.7	11.3	79.9	100.0
of which: G-SIIs	0.7	12.3	7.1	79.9	100.0
of which: O-SIIs	1.4	6.2	12.3	80.0	100.0
Medium	1.0	4.3	6.9	87.8	100.0
Small	1.4	4.8	14.0	79.7	100.0

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 181 banks: Large (98), of which G-SIIs (7), of which O-SIIs (61); Medium (59); Small (24).

Table 115 Breakdown of SA exposure value to banks (excluding covered bonds), by sub-class and bank size (%)

Bank size	IPS	Rated exposures	Unrated exposures	Total banks
All banks	**27.0**	**50.3**	**22.7**	**100.0**
Large	27.2	49.3	23.5	100.0
of which: G-SIIs	0.0	78.0	22.0	100.0
of which: O-SIIs	38.1	38.4	23.5	100.0
Medium	23.2	62.2	14.6	100.0
Small	43.1	50.1	6.8	100.0

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 181 banks : Large (98), of which G-SIIs (7), of which O-SIIs (61); Medium (59); Small (24).

Table 116 Breakdown of SA exposure value to covered bonds, by sub-class and bank size (%)

Bank size	Rated exposures	Unrated exposures	Total covered bonds
All banks	**93.0**	**7.0**	**100.0**
Large	94.2	5.8	100.0
of which: G-SIIs	95.7	4.3	100.0
of which: O-SIIs	94.7	5.3	100.0
Medium	82.9	17.1	100.0
Small	52.8	47.2	100.0

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 119 banks – only banks reporting the "full template".

Table 117 Breakdown of SA exposure value to corporates (excluding SMEs), by sub-class and bank size (%)

Bank size	Rated exposures	Unrated exposures	Total corporate (excluding SME)
All banks	**25.2**	**74.8**	**100.0**
Large	26.1	73.9	100.0
of which: G-SIIs	33.5	66.5	100.0
of which: O-SIIs	14.6	85.4	100.0
Medium	15.4	84.6	100.0
Small	49.7	50.3	100.0

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 181 banks: Large (98), of which G-SIIs (7), of which O-SIIs (61); Medium (59); Small (24).

Table 118 Breakdown of SA exposure value to corporate SMEs, by sub-class and bank size (%)

Bank size	Rated exposures	Unrated exposures	Not identified as rated or unrated	Total corporate SME
All banks	**20.9**	**71.0**	**8.1**	**100.0**
Large	22.5	69.8	7.7	100.0
of which: G-SIIs	30.8	52.5	16.6	100.0
of which: O-SIIs	4.3	91.3	4.4	100.0
Medium	6.1	82.2	11.7	100.0
Small	1.6	98.4	0.0	100.0

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 181 banks: Large (98), of which G-SIIs (7), of which O-SIIs (61); Medium (59); Small (24).

Table 119 Breakdown of SA specialised lending exposure value, by sub-class and bank size (%)

Bank size	Commodity finance	Object finance	Project finance	Rated exposures	Total specialised lending
All banks	**5.6**	**9.3**	**81.5**	**3.6**	**100.0**
Large	6.0	9.9	80.2	3.9	100.0
of which: G-SIIs	14.7	1.6	80.9	2.8	100.0
of which: O-SIIs	0.0	16.7	79.0	4.3	100.0
Medium	0.0	2.1	97.9	0.0	100.0
Small	0.0	0.0	97.9	2.1	100.0

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 181 banks: Large (98), of which G-SIIs (7), of which O-SIIs (61); Medium (59); Small (24).

Table 120 Breakdown of SA equity exposure value, by sub-class and bank size (%)

Bank size	Exposures to certain legislative programmes	Other	Speculative unlisted	Total equity
All banks	**0.8**	**96.2**	**3.0**	**100.0**
Large	0.8	96.7	2.5	100.0
of which: G-SIIs	0.0	93.4	6.6	100.0
of which: O-SIIs	0.4	97.2	2.4	100.0
Medium	0.8	94.3	4.9	100.0
Small	9.3	90.7	0.0	100.0

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 181 banks: Large (98), of which G-SIIs (7), of which O-SIIs (61); Medium (59); Small (24).

Table 121 Breakdown of SA retail exposure value, by sub-class and bank size (%)

Bank size	Other retail	Regulatory retail — non-transactors	Regulatory retail — transactors	Total retail
All banks	**2.1**	**93.5**	**4.4**	**100.0**
Large	1.7	94.2	4.1	100.0
of which: G-SIIs	0.1	96.5	3.4	100.0
of which: O-SIIs	3.2	94.0	2.8	100.0
Medium	6.7	89.1	4.2	100.0
Small	2.5	65.3	32.2	100.0

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 181 banks: Large (98), of which G-SIIs (7), of which O-SIIs (61); Medium (59); Small (24).

Table 122 Breakdown of SA exposure value secured by real estate, by sub-class and bank size (%)

Bank size	General commercial real estate	General residential real estate	Income producing commercial real estate	Income producing residential real estate	Land acquisition, development and construction	Exposures secured by real estate
All banks	**16.2**	**71.1**	**4.5**	**4.3**	**3.9**	**100.0**
Large	16.5	71.1	4.6	3.6	4.2	100.0
of which: G-SIIs	21.1	63.8	4.5	4.4	6.2	100.0
of which: O-SIIs	12.3	75.6	5.4	3.8	2.9	100.0
Medium	14.7	70.7	3.9	8.1	2.6	100.0
Small	15.9	75.0	0.1	4.9	4.1	100.0

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 181 banks: Large (98), of which G-SIIs (7), of which O-SIIs (61); Medium (59); Small (24).

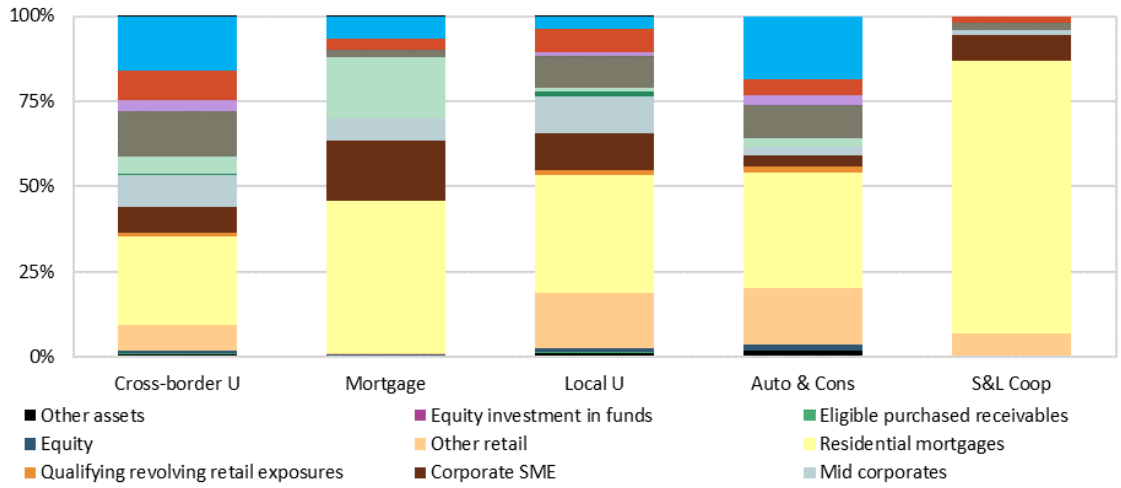
Internal ratings-based approach for credit risk

Composition of exposure value by exposure class

Figure 112 Breakdown of IRB EAD, by exposure (sub-)class and bank size

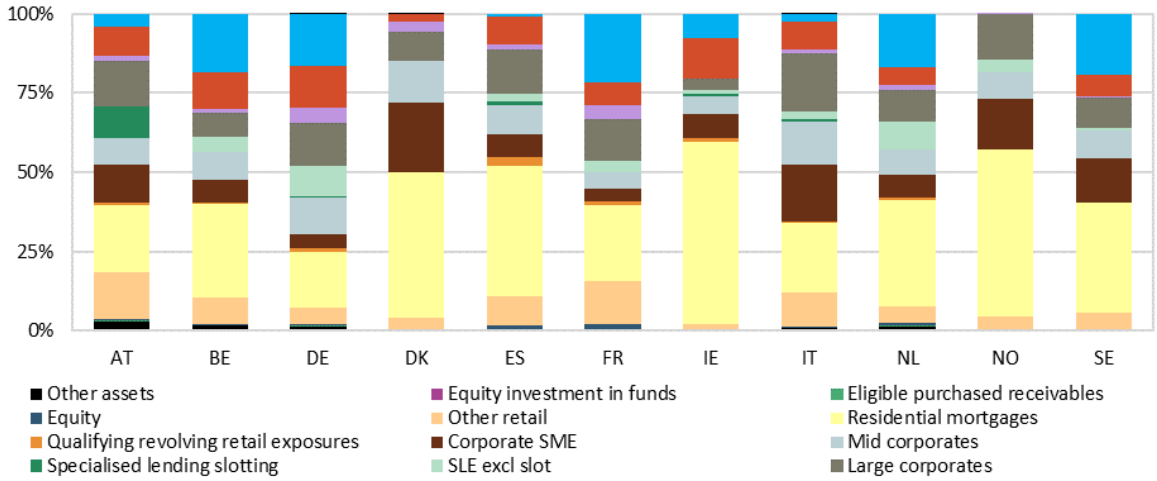
Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 78 banks: Large (62), of which G-SIIs (8), of which O-SIIs (33); Medium (13).

Figure 113 Breakdown of IRB EAD, by exposure (sub-)class and business model



Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 87 banks: Cross-border U (37), Public Dev* (1), Mortgage (5), Other special* (2), Local U (27), Auto & Cons (3), Building Soc* (8), S&L Coop (8), Private* (1), Merchant* (1).
* Not shown in the chart because fewer than three entities in the cluster.

Figure 114 Breakdown of IRB EAD, by exposure (sub-)class and country



Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 87 banks: AT (3), BE (6), DE (17), DK (6), ES (5), FI* (2), FR (7), GR* (1), IE (6), IT (8), LU* (2), LV* (2), NL (5), NO (5), PL* (1), PT* (2), SE (9).
* Not shown in the chart because fewer than three entities in the cluster.

Table 123 Breakdown of IRB EAD to corporates, by exposure sub-class and bank size (%)

Bank size	Financial institutions treated as corporates	Corporates with revenues > EUR 500 m	Corporates with revenues ≤ EUR 500 m	SME treated as corporate	Total corporates (except SL)
All banks	**9.0**	**27.6**	**38.5**	**24.9**	**100.0**
Large	9.0	27.5	38.7	24.8	100.0
of which: G-SIIs	15.2	26.8	44.7	13.3	100.0
of which: O-SIIs	4.1	28.2	33.5	34.2	100.0
Medium	0.0	45.2	9.1	45.7	100.0

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 78 banks: Large (62), of which G-SIIs (8), of which O-SIIs (33); Medium (13).

Table 124 Breakdown of IRB specialised lending EAD (excluding slotting approach), by exposure sub-class and bank size (%)

Bank size	Commodities finance	High-volatility commercial real estate	Income-producing real estate	Object finance	Project finance	Total specialised lending (excluding slotting approach)
All banks	**9.5**	**1.2**	**45.6**	**14.6**	**29.1**	**100.0**
Large	9.6	1.1	45.7	14.5	29.1	100.0
of which: G-SIIs	17.2	0.0	35.6	16.1	31.1	100.0
of which: O-SIIs	2.3	2.7	45.3	16.2	33.4	100.0
Medium	2.0	12.3	42.2	16.7	26.7	100.0

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 78 banks: Large (62), of which G-SIIs (8), of which O-SIIs (33); Medium (13).

Table 125 Breakdown of IRB specialised lending EAD (slotting approach), by exposure sub-class and bank size (%)

Bank size	Commodities finance	High-volatility commercial real estate	Income-producing real estate	Object finance	Project finance	Total specialised lending (slotting approach)
All banks	**0.0**	**1.0**	**37.0**	**13.4**	**48.5**	**100.0**
Large	0.0	1.0	37.8	13.5	47.7	100.0
of which: G-SIIs	0.0	0.0	84.7	4.4	10.9	100.0
of which: O-SIIs	0.0	0.8	34.8	14.6	49.9	100.0
Medium	0.0	0.0	9.4	11.0	79.6	100.0

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 78 banks: Large (62), of which G-SIIs (8), of which O-SIIs (33); Medium (13).

Table 126 Breakdown of IRB EAD to retail and corporate SMEs, by exposure sub-class and bank size (%)

Bank size	Other retail: secured SME	Other retail: unsecured SME	Corporate SME	Total SME
All banks	**9.7**	**21.8**	**68.5**	**100.0**
Large	9.7	21.8	68.5	100.0
of which: G-SIIs	11.4	36.3	52.3	100.0
of which: O-SIIs	8.3	13.1	78.7	100.0
Medium	13.3	18.2	68.5	100.0

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 78 banks: Large (62), of which G-SIIs (8), of which O-SIIs (33); Medium (13).

Table 127 Breakdown of IRB EAD to banks, by exposure sub-class and bank size (%)

Bank size	MDB	PSE	RGLA	Other bank	Total banks
All banks	**7.9**	**4.2**	**4.4**	**83.5**	**100.0**
Large	7.5	4.3	4.4	83.8	100.0
of which: G-SIIs	1.1	2.9	3.5	92.5	100.0
of which: O-SIIs	13.0	5.7	5.3	76.0	100.0
Medium	70.3	0.0	0.0	29.7	100.0

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 78 banks: Large (62), of which G-SIIs (8), of which O-SIIs (33); Medium (13).

Table 128 Breakdown of IRB EAD to sovereigns, by exposure sub-class and bank size (%)

Bank size	MDB	PSE	RGLA	Other sovereign	Total sovereign
All banks	**2.6**	**3.7**	**10.4**	**83.3**	**100.0**
Large	2.6	3.7	10.3	83.4	100.0
of which: G-SIIs	1.9	4.3	1.9	91.9	100.0
of which: O-SIIs	4.0	3.2	24.5	68.2	100.0
Medium	20.6	0.0	74.8	4.6	100.0

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 78 banks: Large (62), of which G-SIIs (8), of which O-SIIs (33); Medium (13).

Table 129 Breakdown of IRB retail EAD, by exposure sub-class and bank size (%)

Bank size	Retail residential real estate	Other retail: secured	Other retail: unsecured	QRRE: revolvers	QRRE: transactors	Total retail
All banks	**73.9**	**5.2**	**18.1**	**1.8**	**0.9**	**100.0**
Large	73.7	5.2	18.3	1.8	0.9	100.0
of which: G-SIIs	69.7	4.9	22.3	2.5	0.6	100.0
of which: O-SIIs	77.1	5.5	14.9	1.4	1.2	100.0
Medium	84.2	2.9	9.8	2.8	0.3	100.0

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 78 banks: Large (62), of which G-SIIs (8), of which O-SIIs (33); Medium (13).

Table 130 Breakdown of IRB EAD to eligible purchased receivables, by exposure sub-class and bank size (%)

Bank size	Corporate	Retail	Total eligible purchased receivables
All banks	**92.8**	**7.2**	**100.0**
Large	92.8	7.2	100.0
of which: G-SIIs	90.1	9.9	100.0
of which: O-SIIs	98.9	1.1	100.0
Medium	0.0	0.0	0.0

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 78 banks: Large (62), of which G-SIIs (8), of which O-SIIs (33); Medium (13).

A-IRB and F-IRB use in the current framework

Table 131 Breakdown of IRB EAD, by exposure (sub-)class and IRB approach (%)

Exposure class	A-IRB	F-IRB
Banks	67	33
Corporate SME	80	20
Eligible purchased receivables	61	39
Financial institutions treated as corporates	90	10
Large corporates	86	14
Medium-sized corporates	78	22
Other retail	100	0
Qualifying revolving retail exposures	100	0
Residential mortgages	100	0
Sovereigns	63	37
Specialised lending excluding slotting	66	34

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 78 banks.

Table 132 Breakdown of IRB EAD, by exposure (sub-)class, bank size and IRB approach (%)

Exposure class	Large		Medium		G-SIIs		O-SIIs	
	A-IRB	F-IRB	A-IRB	F-IRB	A-IRB	F-IRB	A-IRB	F-IRB
Banks	67	33	15	85	94	6	46	54
Corporate SME	80	20	69	31	77	23	81	19
Eligible purchased receivables	61	39	0	0	62	38	60	40
Financial institutions treated as corporates	90	10	0	100	99	1	60	40
Large corporates	86	14	100	0	96	4	74	26
Medium-sized corporates	78	22	90	10	83	17	73	27
Other retail	100	0	100	0	100	0	100	0
Qualifying revolving retail exposures	100	0	100	0	100	0	100	0
Residential mortgages	100	0	100	0	100	0	100	0
Sovereigns	63	37	0	100	80	20	35	65
Specialised lending excluding slotting	65	35	82	18	92	8	33	67

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 78 banks.

Table 133 Breakdown of IRB EAD, by exposure (sub-)class, country and IRB approach (%)

Exposure class	AT		BE		DE		DK		ES		FR		GR		IE		IT		NL		NO		PT		SE	
	A-IRB	F-IRB	A-IRB	F-IRB	A-IRB	F-IRB	A-IRB	F-IRB	A-IRB	F-IRB	A-IRB	F-IRB	A-IRB	F-IRB	A-IRB	F-IRB	A-IRB	F-IRB	A-IRB	F-IRB	A-IRB	F-IRB	A-IRB	F-IRB	A-IRB	F-IRB
Banks	0	100	91	9	35	65	98	2	94	6	93	7	0	0	3	97	98	2	95	5	0	0	0	0	17	83
Corporate SME	0	100	93	7	31	69	94	6	94	6	67	33	6	94	9	91	98	2	99	1	100	0	100	0	86	14
Eligible purchased receivables	0	100	0	0	30	70	86	14	0	0	0	0	0	0	0	0	100	0	100	0	0	0	0	0	14	86
Financial institutions treated as corporates	0	100	100	0	76	24	93	7	96	4	100	0	0	0	100	0	98	2	100	0	100	0	0	0	11	89
Large corporates	0	100	86	14	62	38	95	5	89	11	97	3	0	100	8	92	97	3	100	0	100	0	100	0	73	27
Medium-sized corporates	0	100	94	6	66	34	92	8	94	6	64	36	0	100	21	79	98	2	99	1	100	0	100	0	80	20
Other retail	100	0	100	0	100	0	100	0	100	0	100	0	100	0	100	0	100	0	100	0	100	0	100	0	100	0
Qualifying revolving retail exposures	100	0	100	0	100	0	0	0	100	0	100	0	100	0	100	0	100	0	100	0	0	0	100	0	0	0
Residential mortgages	100	0	100	0	100	0	100	0	100	0	100	0	100	0	100	0	100	0	100	0	100	0	100	0	100	0
Sovereigns	0	100	70	30	44	56	0	0	97	3	74	26	0	0	37	63	99	1	100	0	0	0	0	0	0	100
Specialised lending excluding slotting	0	100	89	11	42	58	98	2	0	100	92	8	0	100	0	100	85	15	100	0	100	0	0	100	80	20

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 87 banks.

Table 134 Breakdown of IRB EAD, by exposure (sub-)class, business model and IRB approach (%)

Exposure class	Auto & Cons		Cross-border U		Local U		Mortgage		S&L Coop	
	A-IRB	F-IRB	A-IRB	F-IRB	A-IRB	F-IRB	A-IRB	F-IRB	A-IRB	F-IRB
Banks	0	100	67	33	56	44	85	15	0	100
Corporate SME	0	0	80	20	77	23	97	3	84	16
Eligible purchased receivables	0	0	66	34	3	97	0	0	0	0
Financial institutions treated as corporates	0	0	90	10	92	8	0	0	0	100
Large corporates	0	0	86	14	80	20	93	7	9	91
Medium-sized corporates	0	100	78	22	78	22	92	8	88	12
Other retail	100	0	100	0	100	0	100	0	100	0
Qualifying revolving retail exposures	100	0	100	0	100	0	0	0	0	0
Residential mortgages	100	0	100	0	100	0	100	0	100	0
Sovereigns	0	100	63	37	20	80	100	0	0	0
Specialised lending excluding slotting	0	0	65	35	16	84	91	9	100	0

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 87 banks.

Operational risk

474. The sample of institutions included in Chapter 0 comprises 193 institutions, 11 of which are subsidiaries of EU parents and only included in average calculations for each business model and country cluster.

475. Regarding regulatory approaches used in the current framework, the following should be noted:

- Fewer than 15% of the institutions in the sample use the AMA. All of the AMA institutions are large institutions, apart from one, which is small.
- All but two G-SII institutions use the AMA.
- The AMA is used in 12 out of 20 Member States in the sample.
- The approach most widely used by small institutions is the BIA.
- Only some universal banks, custody banks and specialised banks use the AMA.

Table 135 Use of current approaches to operational risk (% of banks within sample)

Approach	Percentage
AMA	15
BIA	39
SA	47

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 193 banks.

Table 136 Use of current approaches to operational risk by bank size (% of banks within size cluster)

Approach	Large	Medium	Small
AMA	23	0	5
BIA	23	60	75
SA	54	40	20

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 193 banks.

Table 137 Use of current approaches to operational risk by country (% of banks within country cluster)

Country	AMA	BIA	SA
AT	13	60	27
BE	0	25	75
DE	18	50	32
DK	0	57	43
ES	9	9	82
FI	0	60	40
FR	29	36	36
GR	0	40	60
HR	50	0	50
HU	100	0	0
IE	9	9	82
IT	17	58	25
LU	0	50	50
LV	100	0	0
MT	0	100	0
NL	27	27	45
NO	0	43	57
PL	18	9	73
PT	0	25	75
SE	9	27	64

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Notes: Based on a sample of 193 banks.

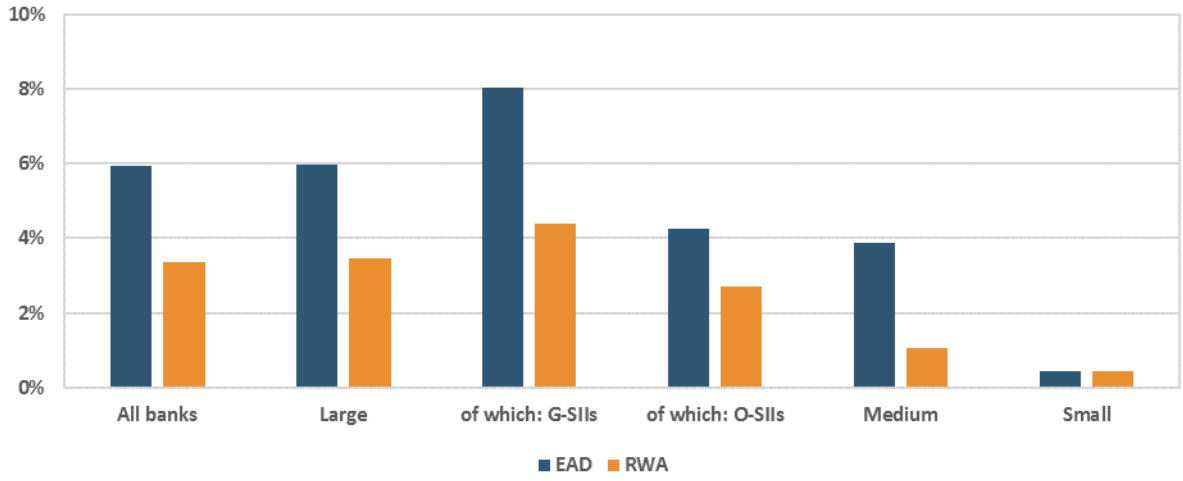
Table 138 Use of current approaches to operational risk by business model (% of banks within business model)

	Cross-border U	Local U	Auto & Cons	Building Soc	S&L Coop	Private	Custody	Merchant	Leasing	Public Dev	Mortgage	Other special
AMA	39	16	0	0	0	0	14	0	0	0	0	8
BIA	2	23	13	80	78	75	57	40	100	80	71	58
SA	59	61	88	20	22	25	29	60	0	20	29	33

Sources: EBA 2018-Q2 QIS data and EBA calculations.
Notes: Based on a sample of 193 banks.

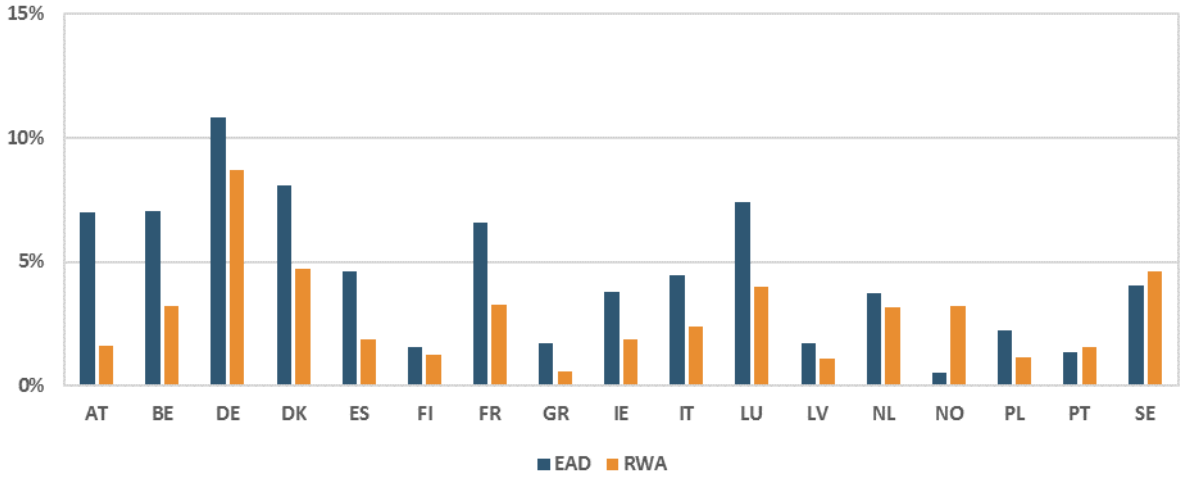
Securities financing transactions (SFTs)

Figure 115 Proportions of CCR EAD and CCR RWA (% of total credit risk EAD and RWA, respectively), by bank size



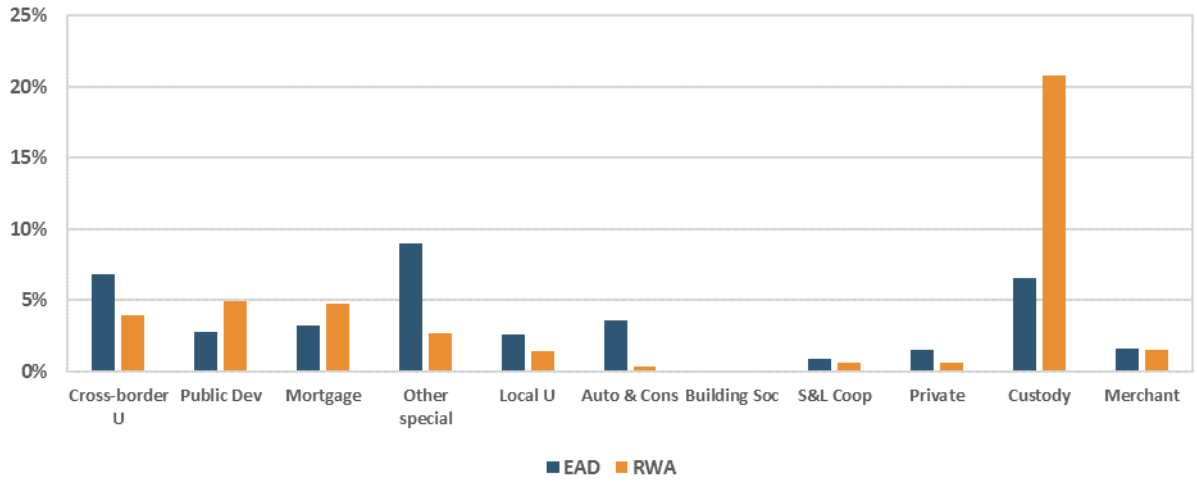
Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 164 banks: Large (91), of which G-SIIs (8), of which O-SIIs (57); Medium (50); Small (23).

Figure 116 Proportions of CCR EAD and CCR RWA (% of total credit risk EAD and RWA, respectively), by country



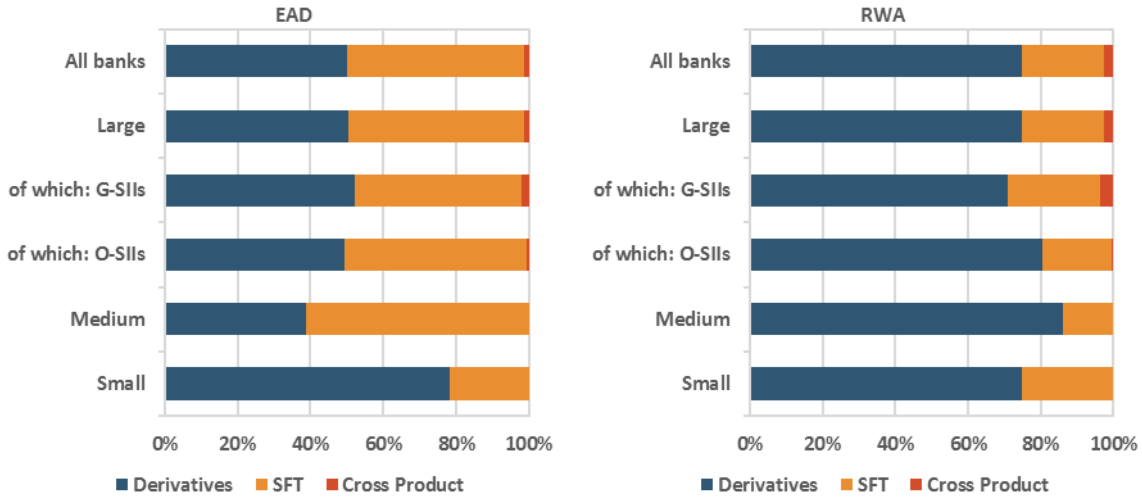
Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 176 banks: AT (15), BE (8), DE (26), DK (8), ES (10), FI (5), FR (14), GR (4), HR* (2), HU* (1), IE (9), IT (23), LU (4), LV* (2), MT* (1), NL (12), NO (6), PL (11), PT (3), SE (11).
* Not shown in the chart because fewer than three entities in the cluster.

Figure 117 Proportions of CCR EAD and CCR RWA (% of total credit risk EAD and RWA, respectively), by business model



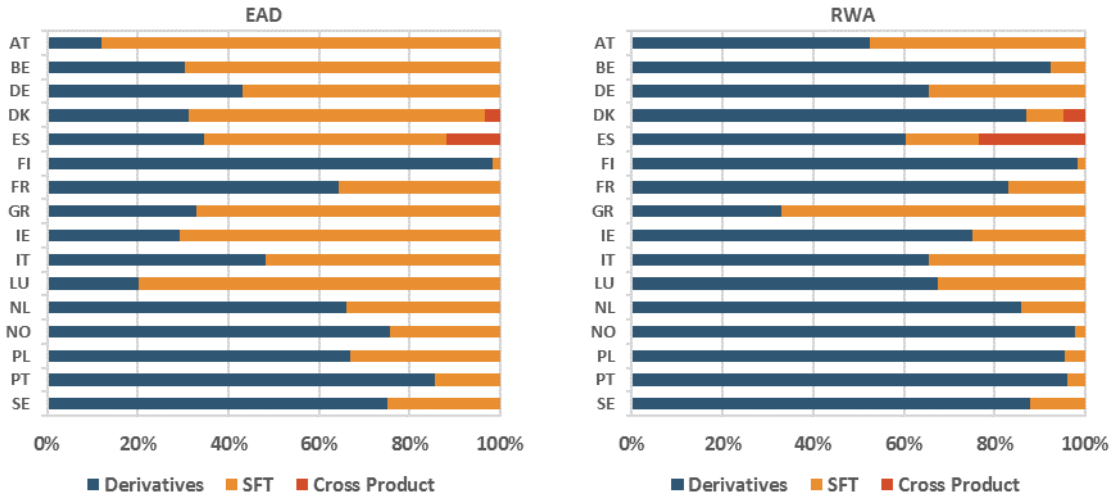
Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 177 banks: Cross-border U (35), Leasing* (2), Public Dev (9), Mortgage (8), Other special (11), Local U (54), Auto & Cons (7), Building Soc (3), S&L Coop (32), Private (5), Custody (6), Merchant (5).
* Not shown in the chart because fewer than three entities in the cluster.

Figure 118 Breakdown of CCR EAD and CCR RWA, by instrument and bank size



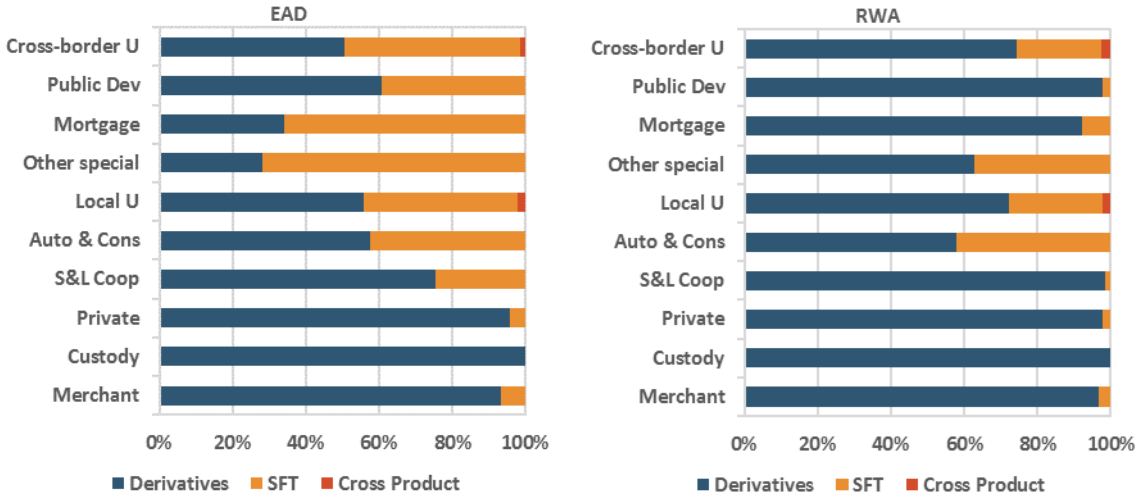
Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 164 banks: Large (91), of which G-SIIs (8), of which O-SIIs (57); Medium (50); Small (23).

Figure 119 Breakdown of CCR EAD and CCR RWA by instrument and country



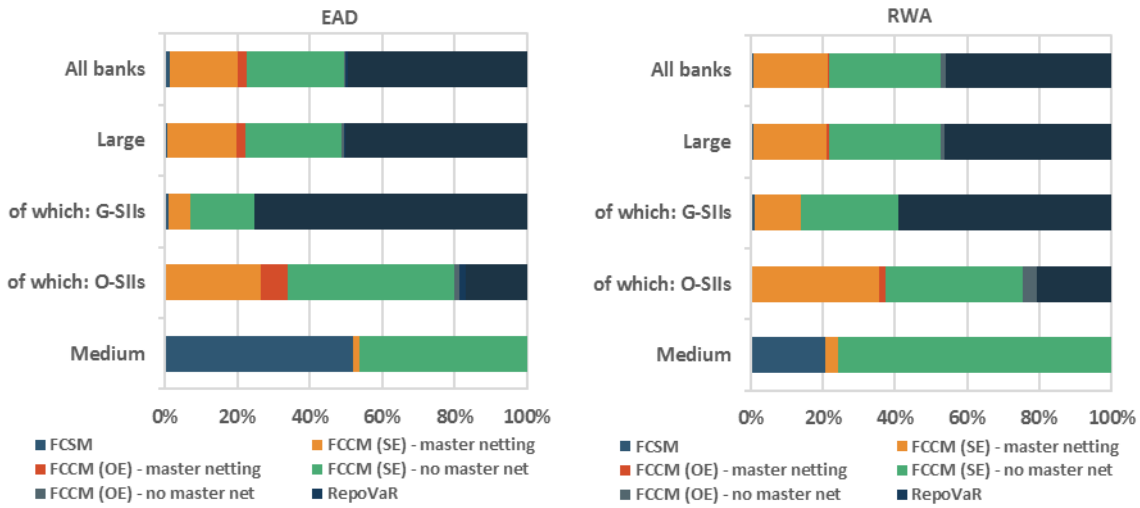
Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 176 banks: AT (15), BE (8), DE (26), DK (8), ES (10), FI (5), FR (14), GR (4), HR* (2), HU* (1), IE (9), IT (23), LU (4), LV* (2), MT* (1), NL (12), NO (6), PL (11), PT (3), SE (11).
* Not shown in the chart because fewer than three entities in the cluster.

Figure 120 Breakdown of CCR EAD and CCR RWA by instrument and business model



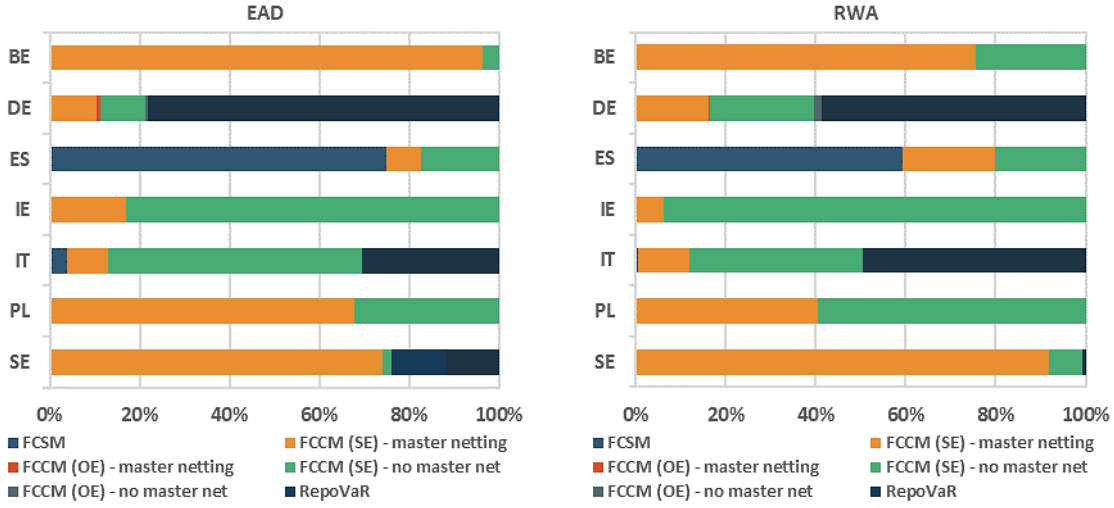
Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 177 banks: Cross-border U (35), Leasing* (2), Public Dev (9), Mortgage (8), Other special (11), Local U (54), Auto & Cons (7), Building Soc** (3), S&L Coop (32), Private (5), Custody (6), Merchant (5).
* Not shown in the chart because fewer than three entities in the cluster.
** Not shown in the chart due to zero CRR EAD and CRR RWA.

Figure 121 Breakdown of CCR EAD and CCR RWA by current approach and bank size



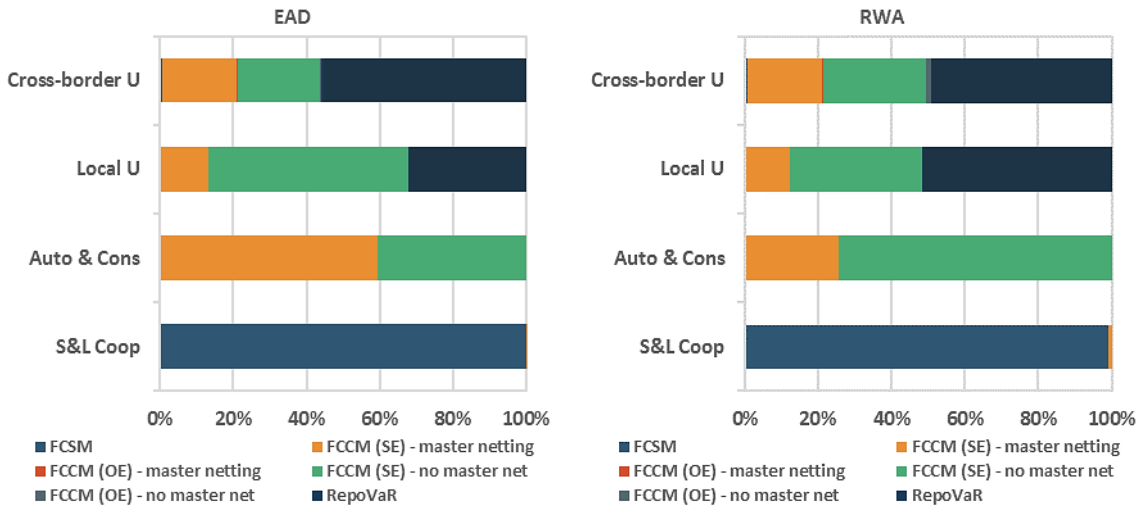
Sources: EBA 2018-Q2 QIS data and EBA calculations.
Notes: Based on a sample of 46 banks: Large (34), of which: G-SIIs (3), of which: O-SIIs (24); Medium (10); Small*(2).
* Not shown in the chart because fewer than three entities in the cluster.

Figure 122 Breakdown of CCR EAD and CCR RWA by current approach and country



Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 53 banks: AT* (1), BE (3), DE (9), DK* (2), EE* (1), ES (4), GR* (2), HR*(2), IE (4), IT (9), LU* (1), NL* (1), PL (7), PT* (2), SE (5).
* Not shown in the chart because fewer than three entities in the cluster.

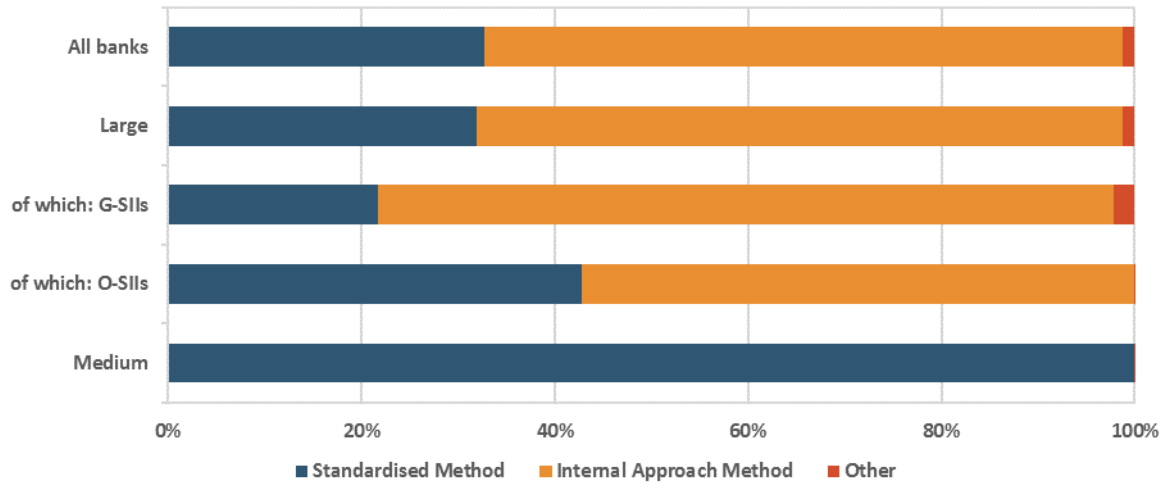
Figure 123 Breakdown of CCR EAD and CCR RWA by current approach and business mdoel



Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 53 banks: Cross-border U (16), Public Dev* (2), Mortgage* (2), Other special* (2), Local U (23), Auto & Cons(3), S&L Coop (3), Custody* (2).
* Not shown in the chart because fewer than three entities in the cluster.

Market risk

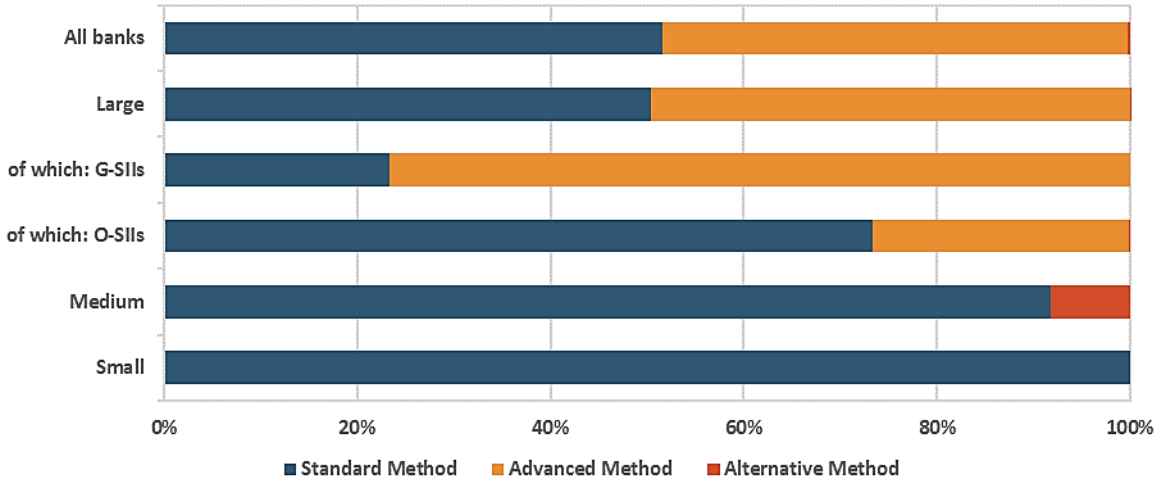
Figure 124 Breakdown of Market risk RWA by approach, by bank size



Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 53 banks: Large (43), of which G-SII (6), of which O-SII (31), Medium (8), Small* (2).
* Not shown in the chart because fewer than three entities in the cluster.

Credit valuation adjustment risk

Figure 125 Breakdown of CVA RWA by approach, by bank size



Sources: EBA 2018-Q2 QIS data and EBA calculations.
Note: Based on a sample of 105 banks: Large (68), of which G-SIIs (8), of which O-SIIs (38), Medium (32), Small (5).

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