Management Solutions
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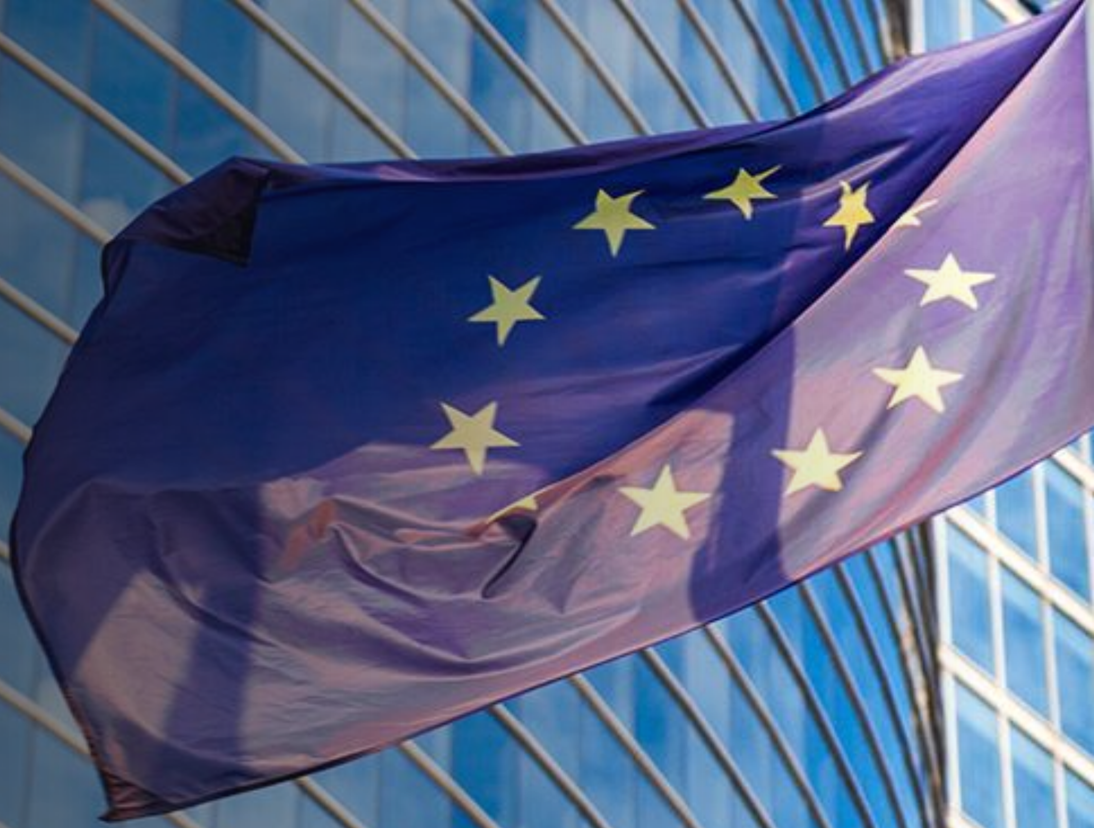
Technical note on the

# Banking Package: CRRIII/CRDVI

## Final (Official Journal) version



# 1 Executive summary

## General overview

**The Banking Package implies the final implementation of Basel III reforms in the EU.**
**The new rules will ensure that EU banks become more resilient to potential future economic shocks**

### Context

- In October 2021, the EC published the first draft of the Banking Package, containing amendments to the Capital Requirements Regulation (CRR III) and the Capital Requirements Directive (CRD VI).
- In April and May 2024, the proposals were adopted by the EP and the Council of the EU.
- On 19 June 2024, the **final versions of CRR III and CRD VI** were **published in the OJEU**.

### Objectives

- Strengthening the risk-based capital framework by implementing final **Basel III reforms**
- Enhancing the focus on ESG risks in the prudential framework
- Further harmonizing supervisory powers and tools
- Introducing new requirements on crypto-assets and shadow banking.
- Reducing public disclosures related costs and improving access to prudential data

### Next steps

- **9 July 2024. CRRIII enters into force**
- **1 January 2025. CRR III general applicability** (exceptions applicable since entering into force)
- **≤11 January 2026.** CRD VI transposed and implemented in Member states.

### Summary of contents

| CRR III | | | CRD VI | |
|---|---|---|---|---|
| Credit risk | Output floor | Crypto-assets | Supervisory powers | Third-country branches |
| Market risk | Own funds | Shadow banking | Fit and proper framework | ESG risks (interaction with buffers) |
| CVA risk | Leverage ratio | Other regulatory developments | | |
| Operational risk | ESG risk (management and disclosure) | | | |

Access CRR III  Access CRD VI

# 1 Executive summary
## Amendments (1/10)

**New more risk sensitive standarised approaches under the credit risk framework, affecting most exposure classes**

| Topic | | Summary of amendments |
|---|---|---|
| ***Credit risk - Standard approach*** *(1/3)* | ***Regional governments*** | • The treatment for exposures to regional governments remains **unchanged** vs current framework. However, in the new version it is specifically defined since it is **not aligned with institutions** treatment anymore. CRR, Art. 115 |
| | ***Public sector entities*** | • Exposures to rated public sector entities will receive the same treatment as externally rated exposures to regional governments or local authorities (**downgrade from BBB+ to BBB-**). CRR, Art. 116<br>• Exposures to unrated regional governments are assigned a risk level based on the same rating assigned to their home government (**downgraded from A+ to A-**). CRR, Art. 116 |
| | ***Multilateral Development Banks*** | • CRR III amends the prudential treatment for **rated MDBs**, that are assigned specific risk weights. CRR, Art. 117 (1)<br>• Unrated exposures to MDBs are assigned a risk weight of 50 %. CRR, Art. 117 (1)<br>• MDBs out of the regulatory list will be risk weighted in accordance with their own external rating. CRR, Art. 117 (1) |
| | ***Institutions*** | • For **externally rated** institutions (ECRA), **recalibration** of RW (RW 50% to 30%). The use of ratings that incorporate public support, except for public entities, is prohibited. CRR, Art. 120<br>• For **unrated exposures**, the Standardised Credit Risk Assessment Approach (SCRA) applies. Institutions shall classify this kind of exposures into one of three grades based on a set of quantitative and qualitative criteria. CRR, Art. 121 |

# 1 Executive summary
## Amendments (2/10)

### New more risk sensitive standarised approaches under the credit risk framework

| Topic | | Summary of amendments |
|---|---|---|
| ***Credit risk - Standard approach** (2/3)* | ***Corporates*** | • RW **recalibration** for externally rated exposures (RW 100% to 75%). CRR, Art. 122<br>• **Preferential RW of 65% until December 2032** for **high quality non-externally rated corporates** (PD<0.5%), in order to mitigate the impact of the output floor. CRR, Art. 465 (3)<br>• For the purposes of the **SME supporting factor application**, SMEs will also be defined as those enterprisese with less than EUR 50 million annual turnover. CRR, Art. 5 (b) |
| | ***Specialised financing*** | • **New category** under SA, seeking alignment with IRB. CRR, Art. 122a<br>• **High quality object finance** related exposures with no specific rating may be assigned a **RW of 80%** (vs 100%). CRR, Art. 122a |
| | ***Retail*** | • Greater **alignment** with the **IRB** retail portfolio. CRR, Art. 123<br>• **Preferential treatment** for **transactor** exposures and **loans linked to pensions or employees' salaries**. CRR, Art. 123 |
| | ***Mortgages*** | • **Recalibration** of the **loan splitting approach** (LSA). CRR, Art. 125<br>• Introduction of a **fall-back** treatment when additional conditions for mortgages are not met. CRR, Art. 126<br>• Distinction of **income producing real estate exposures (IPRE**), receiving the fall-back treatment or 150% RW when general conditions are not met. CRR, Art. 126<br>• Distinction **of land acquisition, development and construction (ADC)** exposures, receiving a 150% RW. Consequently, speculative immovable property treatment is removed. CRR, Art. 126a<br>• Property value **measured at loan origination**, unless modifications “unequivocally” increase the value of the property (e.g improvements to the energy efficiency). CRR, Art. 208 |
| | ***Equity*** | • **General increase** in RW (rage 150%- 400%), **with some exceptions**: **strategic long-term investments, equity exposures to central banks** and equity holdings on national legislated programmes. CRR, Art. 133 |
| | ***Currency Mismatch*** | • 1.5 factor over unhedged retail and exposures secured by mortgages on residential property with uncovered currency mismatch. CRR, Art.123a |

# 1 Executive summary
## Amendments (3/10)

**Low default exposure classes cannot be treated under A-IRB approach anymore. Floor values introduced for bank-estimated IRB parameters**

| Topic | | Summary of amendments |
|---|---|---|
| ***Credit risk - Standard approach*** *(3/3)* | ***Off-balance*** | • 10% CCFs for unconditionally cancellable commitments (phased-in period until December 2032) and 40% for other commitments regardless of their maturity. CRR, Art. 111 (2)<br>• 0% CCF still applicable to corporates, including SME, under closely monitoring or when an action from the institution is required. CRR, Art. 495d<br>• The treatment of off-balance-sheet exposures to CIU is also adjusted. The exposure value of a minimum value commitment that meets a set of conditions shall be calculated as the discounted present value of the guaranteed amount using a discount factor derived from a **risk-free rate defined under the market risk framework**. CRR, Art. 132c (2) |
| ***Credit Risk - IRB approach*** *(1/2)* | ***Perimeter*** | • **Removal** of **the A-IRB approach for certain exposure classes,** e. g. exposures to **large corporates** (€500 million annual turnover), to **banks** and **other financial sector entities**. Instead, institutions can **only use** the **F-IRB approach** and therefore only model PD. CRR Art. 150, Art. 151 (8)<br>• For **equity exposures** the IRB approaches are replaced by SA approach. CRR, Art. 142 (5)(a)<br>• For specialized lending the **A-IRB approach remains available regardless** of the size of the obligor, unlike the treatment applicable to other corporate exposures. |
| | ***Exposure classes*** | • **New exposure class (RGLA-PSE) for regional governments and local authorities (RGLAs) as well as public sector entities (PSEs).** CRR Art. 147 (2), 151 (11) |
| | ***Input floors under the A-IRB approach*** | • The **new minimum thresholds** apply to institutions' own PD, LGD and CCF estimates **, but not** to **exposures covered by an eligible guarantee from the government, central bank or ECB**. CRR, Art.159a<br>• The new minimum parameters applicable to corporate exposures also apply to **specialised lending exposures**. CRR Art. 161 (4), 495 (b)<br>• Specialised lending progressive LGD levels: starting with a factor of 50% (from 2025) gradually increasing to 100% over 5 years. CRR Art.495 (b) |
| | ***LGD under F-IRB*** | • Downward LGD recalibration (**40% → 45%) for claims on senior unsecured exposures to corporates.** CRR Art. 161 (1) |

# 1 Executive summary

## Amendments (4/10)

**Permanent Partial Use (PPU) no longer conditioned to all exposure classes being treated under the IRB approach. Double default method disappears. Double default method disappears**

| Topic | | Summary of amendments |
|---|---|---|
| ***Credit Risk - IRB approach (2/2)*** | ***Off- balance*** | • Estimation of the IRB CCF with a 50% entry floor of the respective SA CCF. CRR Art. 166 (8)(c)<br>• The IRB-CCF uses a fixed 12-month horizon approach. CRR Art. 182 (g)<br>• Internal CCFs are allowed only for revolving commitments. CRR Art. 168 (8)(b)<br>• CCFs must consider new provisions until a default-triggered event occurs. CRR, Art. 182 (1)(c)<br>• IRB-CCF is based on homogeneous segments. Internal CCF estimations will not apply to exposures with different risk characteristics. CRR, Art. 182 (h) |
| | ***Formula simplification*** | • Removal of the **double default** method, which will be directly calculated as RW x Exposure. CRR, Art. 153 (3), 154 (2)<br>• Deletion of the **1.06 scaling factor that applies to the risk weighted exposure amounts for credit risk under the IRB approaches.** CRR Art. 153 (1), Art. 154 (1) |
| | ***Permanent partial use*** | • The adoption of the IRB approaches for **one exposure class** by an institution is **no longer conditioned** to the fact that **all exposure classes of its banking book should eventually be treated under the IRB approach ("IRB roll out")**. Once the IRB approach is implemented for one exposure class, it shall do so for all the exposures within that exposure class unless it has received the CA permission for permanent partial use (PPU). CRR Art. 148, Art. 150<br>• **Return to less sophisticated approaches is possible during a transition period (3 years)** subject to CA approval under a **simplified procedure**. CRR Art. 494 (d) |
| ***Credit risk mitigation techniques*** | ***Mitigation techniques and calculation of RW*** | • A-IRB **exposures secured by SA and F-IRB guarantors** should be treated as if the exposure was to SA and F-IRB: RW substitution or PD/LGD substitution. CRR, Art. 183, 235 (a), 236 (a)<br>• The formula for calculating the effective LGD (LGD*) has been modified; the minimum LGD table for secured exposures has been deleted and new specific LGD values and haircuts applicable in the formula have been defined. The haircuts apply to both the A-IRB and the F-IRB method. CRR, Arts. 224-230<br>• The EBA should report to the Commission on **the eligibility and use of credit insurance as a risk mitigation technique** and on the appropriate risk parameters they should be associated with under the SA-CR and Foundations IRB Approach. CRR Art. 495d |

**In market risk, new instruments in TB and BB are included. In addition, CRR introduced ASA risk management framework requirements, as policies, procedures and controls**

| Topic | | Summary of amendments |
|---|---|---|
| ***Market Risk*** | ***1 year delay*** | • Application of the rules on market risk postponed by one year, until **January 1st, 2026** to ensure a global level playing field, for those big European banks competing with other global players[1]. |
| | ***TB-BB Boundary*** | • **New instruments** are included and clearly defined. In addition, **new requirements** and **allows** are included, exceptionally, for reclassifications between the TB and the BB. |
| | ***Alternative standardised approach (ASA)*** | • **Introduction** of **ASA risk management framework requirements**: policies, procedures and controls, second and third line of defense funtions, risk control unit shall be responsible for designing and implementing the ASA.… CRR, Art.325c (1) and (4-6)<br>• **Lower RW for carbon trading** emissions (EU ETS carbon trading=40%; non-EU ETS carbon trading=60%). CRR, Art.325 as (b))<br>• **Specific treatment** for the institution's holdings of its own debt instrument. CRR, Art.325c (2) |
| | ***Internal Model Approach (IMA)*** | • An institution shall not include its **own credit spreads** in the **calculation of the measures for positions** in the institution's own debt instruments and shall not be subject to the additional own funds requirements for the holdings of its own debt instruments. CRR, Art.325ba (1)(2))<br>• **Incorporation** of **risk factors** corresponding to gold and to the individual foreign currencies in which the institution's positions are denominated by the internal risk measurement. CRR, Art.325 bh, (1)(d))<br>• For **positions in CIUs**, institutions shall look through the underlying positions of the CIUs at least on a weekly basis to calculate their own funds requirements. Institutions that do not have adequate data inputs or information to calculate the own funds requirements may rely on third-party data. CRR, Art.325 bh (1)(i)) |
| | ***Impact assessment*** | • **Differences between the EU and third countries** regarding market risk regulations, including the impact and implementation dates will be **monitored by the EC**. If significant differences were found, the EC can adopt delegated acts to amend regulations applying until 10 July 2026, date of application of EBA report on the implementation of international standards on own funds requirements for market risk in third countries or for up to three years in the absence of such an act. CRR, Art.461 (a), Annex I |

1. Based on the Keynote speech by Commissioner McGuinness at the European Financial Integration 2024 joint conference of the European Commission and the European Central Bank: European Financial Integration 2024 (europa.eu)

# 1 Executive summary

## Amendments (6/10)

**New capital regime for CVA risk, synchronized with FRTB. The operational risk framework introduces a single standardised approach, replacing previous methods, and robust data collection and governance requirements. The output floor lever sets a minimum capital requirement based on the standardised methods applied universally across consolidation levels**

| Topic | | Summary of amendments |
|---|---|---|
| ***CVA risk*** | ***Capital requirements*** | • The EBA is mandated to develop RTS developing technical aspects of the CVA internal regulatory model (EAD, PD, LGD). CRR, Art.383a (4) |
| | ***Reporting*** | • New reporting requirements for transactions exempted from the EU CVA risk capital charge (EU CVA exemptions). CRR, Art.382 |
| ***Operational risk*** | ***Capital requirements*** | • New standardised operational risk method (SMA) based on the business indicator to replace the current methods. CRR, Arts. 312-315 |
| | ***Data collection*** | • All institutions with a business indicator equal to or above EUR 750 million will be required to maintain a loss data set and to calculate their annual operational risk losses for disclosure purposes, unless CAs grant a waiver from that requirement (only allowed if below EUR 1 billion). CRR, Art. 316 |
| | ***Governance*** | • Development of the Operational Risk Management Framework (e.g. independent risk management functions, reporting system, internal validation…). CRR, Art 323 |
| ***Output floor (OF)*** | ***Transition period*** | • 5-year transition period for the Output Floor implementation, starting at 50% in 2025, with an annual increase of 5% until 2029 (70%) and finally setting 72.5% in 2030. Favorable treatment during the transition period for corporates without external rating, derivatives and mortgages on residential property institutions as well as securitisations under certain conditions. CRR, Art 465 |
| | ***Safeguards*** | • Safeguards are introduced to avoid unwarranted increases in P2R and systemic risk buffer (SyRB) requirements. These cannot be used to cover risks that are already fully covered by the OF. CRD, Arts. 104 a), 104 b), 131 |

## Own funds fine tuning. Institutions subject to supplementary supervision will risk weight their insurance qualifying holdings at 100%

| Topic | | Summary of amendments |
|---|---|---|
| *Own funds* | *G-SIIs issued liabilities* | • G-SIIs must deduct not only indirect and synthetic holdings of equity instruments but also holdings of **eligible liabilities**. CRR, Arts. 4(1), 114, 126 |
| | *Capital instruments of Mutuals, Coop...* | • The article on **capital instruments of mutuals, cooperative societies, savings institutions** or similar institutions is deleted following the UK's withdrawal from the EU (it was introduced to address the needs of UK-based institutions). CRR, Art. 27(1)(a) & (v) → deleted. |
| | *Deductions from CET1 items* | • The provisions stipulated by the regulation regarding minimum loss coverage[1] for **non-performing exposures** and **CRRII** should be taken into account for the calculation of the relevant CET1 elements used in the calculation of the prudential thresholds. CRR, Art. 46(1), 48(1), 60(1), 70(1), 70(1)<br>• Deductions for **equity** exposures under the IRB approach are no longer applicable. CRR, Art. 36(1)(k)(v) → deleted.<br>• Exposures in the form of units or shares in a **CIU** to which a 1 250 % risk weight is assigned in accordance with the fall back approach can be deducted alternatively. CRR, Art 36(1)(k)(vi) |
| | *Insurance holdings* | • In the case of institutions subject to supplementary supervision, insurance qualifying holdings must always receive a **100% RW**. CRR, Art. 49(4). |
| | *Non-qualifying capital Instruments* | • Institutions must not deduct holdings of capital instruments issued by **regulated financial sector entities** that do not qualify as regulatory capital; instead, they should apply appropriate risk weights according to the regulatory guidelines. CRR, Art 74 |
| | *Subsidiaries in third countries* | • Third country subsidiaries are taken into account when determining **minority interests**, as well as additional Tier 1 and Tier 2 instruments issued by these subsidiaries. CRR, Art, 84 (1), 85 (1), 87 (1) 88b |

1. Regulation (EU) 2019/630

# 1 Executive summary
## Amendments (8/10)

**Adjustments to the exposure value for the leverage ratio. Extension of the disclosure and risk management requirements on ESG risks (specific prudential requirements subject to EBA impact analysis)**

| Topic | | Summary of amendments |
|---|---|---|
| *Leverage Ratio* | *Exposure value* | • **Exposures** from shareholders **collateralized to at least 125%** shall be excluded from the exposure value while shareholders are credit institutions and do not exercise control over the institution, among other conditions. CRR, Art. 429a (1)(da)<br>• **Modifications in the calculation** of the exposure value of derivatives, off-balance-sheet items and provisions related to regular way purchases and sales awaiting settlement [1]. CRR, Art. 429c, 429f(3), 429(6), 429g(1) |
| *ESG risks* | *Definition* | • New harmonised **definitions** of the different types of risks in the universe of ESG risks are included. CRR, Art. 4 |
| | *Disclosure* | • Institutions, following a proporcionality principle, shall **disclose information on ESG risks**, distinguishing environmental, social and governance risks, and physical risks and transition risks for environmental risks. CRR, Art. 449a (1) |
| | *Prudential treatment* | • EBA, shall, on the basis of available data, assess whether the **dedicated prudential treatment of exposures** related to assets or liabilities, subject to the impact of environmental or social factors is to be adjusted and elaborate successive reports on its findings (Jul.24, Dec.24, Dec25). On the basis of those reports, the Commission shall present a legislative proposal by 31 Dic.26. CRR, Art. 501c |
| | *Internal capital, governance and risk management* | • As part of their internal capital assessment, institutions shall explicitly take into account the short, medium and long term for the **coverage of ESG risks**. CRD, Art. 73<br>• Robust governance arrangements shall include **remuneration policies and practices** must be consistent with and promote sound and effective risk management, including by taking into account the institutions' risk appetite in terms of ESG risks. They also shall be gender neutral. CRD, Art. 74 (1)<br>• Management body shall approve and at least every two years review the **strategies and policies** for taking up, managing, monitoring and mitigating the **risks**, including those resulting from current and short, medium and long term impacts from ESG factors. It shall also monitor and implement plans and quantifiable targets to address financial risks from ESG factors. CRD, Art.76 (a)(1) |

# 1 Executive summary
## Amendments (9/10)

**Institutions must report to the competent authorities their 10 largest exposures to shadow banking entities. They must also disclose these exposures on an aggregate basis. The Commission will propose new legislation for prudential and reporting standards for crypto-assets. Until then, transitional capital requirements will apply to crypto-assets**

| Topic | | Summary of amendments |
|---|---|---|
| ***Shadow Banking*** | ***Reporting requirements*** | • Institutions shall report the following information to their CA in relation to their **10 largest exposures to shadow banking entities** on a consolidated basis: i) **identification of the client** or the group of connected clients; ii) **type of funded or unfunded credit protection**; iii) **exposure value** before and after taking into account the effect of the credit risk mitigation; iv) expected run-off of the exposure. CRR, Art. 394 (2) |
| | ***Limits to large exposures*** | • 30 months after the date of entry into force of this amending regulation, the EBA shall **issue guidelines taking due account of the contribution of shadow banking entities to the capital markets union**, the potential adverse impact that any changes of those guidelines could have on the business model and risk profile of the institutions and on the stability and the orderly functioning of financial markets. CRR, Art. 395 (2a) |
| ***Crypto-assets*** | ***Definitions*** | • New **definitions** of crypto-assets and crypto-assets service based on MICA Regulation. CRR, Art. 5 (a) |
| | ***Supervisory reporting and disclosure*** | • EU banks will be subject to new **requirements to report** to supervisors on their cryptoasset exposures. CRR3 will also require banks categorised as large institutions to include information related to cryptoassets in their annual 'Pillar 3' disclosures. CRR, Art. 451b |
| | ***Prudential Treatment*** | • By June 2025, the EC will propose legislation for **prudential treatment of crypto-asset exposures**. Until then, tokenized traditional assets are treated as traditional, ART with compliant issuers get a 250% RW, and other crypto-assets get a 1,250% RW, with limits on their value relative to Tier 1 capital. CRR, Art. 501d |

# 1 Executive summary
## Amendments (10/10)

**The Banking Package also include a set of amendments of different nature. Among others, it is worthy to mention the developments on the Fit and Proper Framework and third country branches related requirements**

| Topic | | Summary of amendments |
|---|---|---|
| ***Other developments*** | ***Fit and Proper Framework*** | • Clarification of the role of banks and CAs for checking the compliance of **board members**.<br>• Settlement of minimum requirements for **key function holders**. CRD, Arts.91 (a-d) |
| | ***Third country Branches (TCB)*** | • Authorization subject to minimum requirements that must include **cooperation and reporting** arrangements so that the CAs have access to enough information about the TCB's parent company and can cooperate with the supervisor.<br>• TCB must meet **capital** and **liquidity** requirements, internal **governance** and **risk control** requirements.<br>• Obligation of **reporting** regularly information on their compliance with the requirements laid out in the CRD and in national law and financial information in relation to assets/ liabilities on their books.<br>• Supervisors must conduct **regular reviews** of TCBs' compliance with their regulatory requirements. CRD, Title VI) |
| | ***Link to Dora*** | • Robust governance arrangements shall also include network and information systems that are set up and managed in accordance with DORA CRR, Art. 74 |
| | ***EBA disclosures*** | • EBA is empowered to **centralize the publication** of prudential disclosures and mandated to **publish disclosures** of **small and non-complex institutions** based on their supervisory reporting. ESG risks disclosure is expanded to **all institutions**. CRR, Arts.433, 434, ¬ 449 (a) |
| | ***New supervisory powers*** | • **Expansion** of the list of supervisory powers available to cover operations such as **acquisitions** by a credit institution of a material holding in a financial or non-financial entity, the material **transfer of assets or liabilities** and **merger** or **divisions**. CRD, Art.27 a-n) |

1. Executive summary
2. **Why Management Solutions?**

# 2 Why Management Solutions?
## Differential values in risk and capital

**MS has extensive experience in risk and capital management, particularly in the processes of regulatory compliance (Basel/CRR/CRD)**

### MS differential values in risk and capital management

1. **Experience with supervisory bodies.** MS is a "highly rated external service provider" in internal capital models by different European and American Supervisors. In particular, it has 7 framework service agreements with ECB related to internal models and is the highest rated provider in the capital field.

2. **Regulatory modelling.** MS has extensive experience in modelling: (i) credit risk (IRB, IFRS 9 & CECL, stress testing, others), (ii) market risk, CCR and IRRBB (VaR, pensions, xVA); (iii) ALM and liquidity; (iv) residual value; (v) economic capital; and (vi) operational risk.  among others.

3. **Independent validation**. MS collaborates with different institutions as an independent supervisor of internal models, verifying compliance with regulatory requirements (e.g. CRR, EBA, ECB Guidance on internal models...) to obtain approval from supervisors (e.g. ECB, DNB, Bundesbank...).

4. **Experience in the design and implementation of capital calculation engines.** MS has extensive experience in supporting institutions in the design and implementation of capital calculation and reporting solutions (including our proprietary MIR and SIRO tools, already adapted to BIS IV, as well as in the execution of capital impact analysis exercises, capital optimisation...

5. **Experience in Cryptoassets.** The key to MS's value proposition in the field of cryptocurrencies (extensible to blockchain) and digital assets  is the combination of expertise in the world of payments and financial investments together with a functional and technical understanding of the underlying technology, as well as knowledge of the regulations developed in this respect (MiCA).

6. **Experience in ESG.** MS has a group of experts who support its clients in developing and implementing ESG risk management frameworks (governance, risk appetite, integration into management,…), reporting and disclosure (e.g. Pilar 3 ESG, Sustainability reports, transition plans, data estrategy) and methodologies (including its MS2 proprietary tool).

7. **Specialised team.** MS has a team of more than 1,000 experts in the field of risk and capital management (modelling, regulation, impacts, information systems, reporting...), combining quantitative and technical expertise with strong regulatory knowledge.

# MIR: Capital Calculation and Reporting tool

**MIR is adapted to CRR III in order to provide capital calculations[1] leveraged on the existing data already available for CRR II calculations plus a small amount of additional inputs**

BIS IV engine runs on the inputs already available and a **small subset of additional data** (e.g. IPRE distinction for mortgages)

The results of BIS IV engine will allow for an **estimation of impacts at granular (transaction) level**

The **implementation of** BIS IV engine can be carried out on the existing installation or on a new infrastructure, **depending on the institution's preferences**

The implementation of BIS IV **allows a gradual adaptation of the institutions**, anticipating a large part of the changes at ETL level that will be necessary for Basel IV entry into force for January 2025

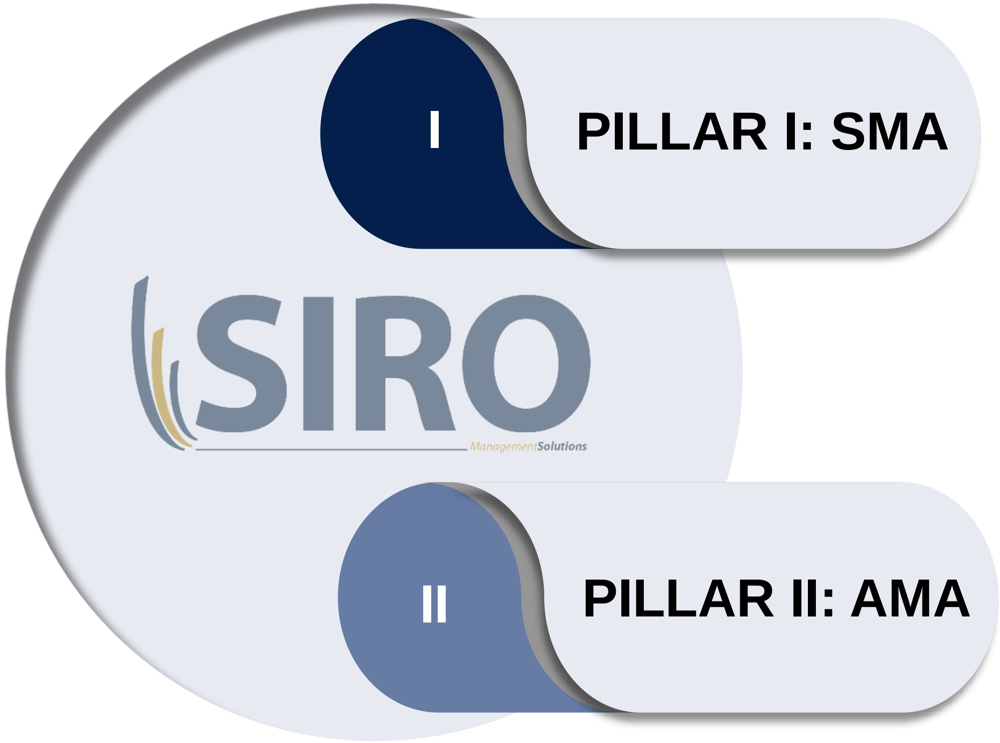
**The results** of the BIS IV engine are **independent** of the official results (BIS III) and have the same frequency (usually monthly). In addition, **different scenarios** can be **simulated over** the transition period

MIR allows to obtain **comparative BIS IV-BIS III reports** with specific reports on output floor impact, return-to-foundation or standard, impacts by segment, product,...

1. For Credit Risk (including the impact on the capital ratio of the shortfall / backstop), Counterparty Risk and SA FRTB.

# SIRO: Integrated Non-Financial Risk Management Tool

**SIRO is adapted to the updated prudential framework in order to provide capital calculations for Operational Risk based on the business indicator (Pillar I) and internal AMA models (Pillar II)**




SIRO has a functionality for **regulatory capital calculation according to the new standardised approach (SMA)**, in particular it calculates the business indicator and the loss multiplier.

The business indicator (BIC) is obtained through the provisioning of accounting magnitudes and the internal loss multiplier (ILM) from the extraction of information from the operational loss data set, applying filters and clusters indicated in the regulation.

The process of obtaining information for the construction of the loss multiplier is equally useful to cover aspects of historical loss disclosure required under Pillar III.

SIRO has a specific engine for **calculating economic capital for operational risk under Advanced Measurement Approaches (AMA)** that allows obtaining an expected loss and an Operational Value at Risk (Op VaR).

The calculation engine contains functionalities for data analysis, the construction of operational risk classes, the adjustment of multiple frequency and severity distributions, including mixtures, the integration of internal loss data, RCSA/Scenario and external loss data in such adjustments and, finally, the calculation of capital through Monte Carlo simulations. It also incorporates the effect of correlation and insurance and the analysis of sensitivity and stability of the calculations obtained.

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