

Unlocking the future: OSFI's game-changing crypto-assets

“OSFI unveils
comprehensive crypto-asset
capital and liquidity
requirements”

January 2024



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Background

The Office of the Superintendent of Financial Institutions (OSFI) has issued a guideline for the regulatory treatment of crypto-assets in federally regulated deposit-taking institutions. The guideline categorizes crypto-asset exposures into simplified and comprehensive approaches and covers considerations such as capital deduction, liquidity treatment and risk management. It takes effect from fiscal Q1 2025.

SCOPE APPLICABILITY

Below is the scope of OSFI's proposed guideline:

- ▶ The guideline covers crypto-assets, defined as private digital assets using cryptography and distributed ledger technologies (DLT) or similar tech.
- ▶ Digital assets represent value for payment, investment or accessing goods/services. Dematerialized securities issued through DLT are within scope (tokenized traditional assets).
- ▶ Dematerialized securities managed using centralized electronic registers are not covered.
- ▶ Regulatory capital and liquidity requirements of central bank digital currencies (CBDCs) are out of scope.
- ▶ "Exposure" includes on-/off-balance sheet amounts with credit, market, operational and liquidity risks.
- ▶ Operational risk requirements and risk management apply to banks' crypto-asset activities, including custodial services for client crypto-assets on a segregated basis.

REGULATORY TREATMENT OPTIONS

Simplified approach

- ▶ Deduct all crypto-asset exposures, regardless of classification.
- ▶ Crypto-assets are considered non-HQLA in the LCR and NSFR standards.

Detailed approach

- ▶ Capital and liquidity treatments vary depending on crypto-asset classification (e.g., Group 1a, 1b, 2a or 2b).

Simplified approach

- ▶ Credit valuation adjustment (CVA)
- ▶ Counterparty credit risk (CCR)
- ▶ Operational risk
- ▶ Leverage
- ▶ Large exposure

Above table highlights the key differences between the two approaches, including how crypto-assets are treated in CET1 capital, the LCR and NSFR standards, and additional risk considerations banks must consider.

Categorization of crypto-assets



For the purposes of credit, market and liquidity risk, the regulatory capital and liquidity treatment of a bank's crypto-asset exposures varies according to the prudential classification of the crypto-assets. To determine the prudential classification, crypto-assets should be assessed on an ongoing basis and classified into two broad groups:

GROUP 1

Crypto-assets that meet the classification conditions set out in Annex 1¹

1a: Tokenized crypto-assets

- ▶ Consistent with the CAR and LAR treatment of the related asset

1b: Stablecoins

- ▶ Similar to 1a, but with additional criteria on the effectiveness of an asset's stabilization mechanism in Annex 1

GROUP 2

Crypto-assets that fail to meet the classification conditions set out in Annex 1¹

2a: Hedged crypto-assets

- ▶ Fails the classification conditions for Group 1, but satisfies the hedging recognition criteria in Annex 3¹

2b: Other crypto-assets

- ▶ Exposures will be fully deducted from CET 1 capital

Banks, on an ongoing basis, are responsible for assessing whether the crypto-assets to which they are exposed are compliant with the classification conditions set out in Annex 1. Banks should fully document the information used in determining compliance with the classification conditions and make this available to OSFI on request. OSFI may override banks' classification decisions if it does not agree with the banks' assessments.

Banking book vs. trading book boundaries

The allocation of crypto-assets between the banking book and trading book is determined by OSFI Chapter 9 of the Capital Adequacy Requirements (CAR). There are specific criteria for assigning different types of crypto-assets to either book:

- ▶ Group 1a crypto-assets are assigned based on the boundary criteria applied to the non-tokenized equivalent traditional assets.
- ▶ Group 1b crypto-assets are assigned based on the boundary criteria applied to the reference asset(s).
- ▶ Group 2a crypto-assets are treated according to the proposed market risk rules, similar to foreign currencies and commodities risk. Compliance with the market risk framework in Chapter 9 of CAR is necessary for this categorization.
- ▶ Group 2b crypto-assets are treated according to a standardized conservative regulatory capital and liquidity treatment specified in the guideline.

What does it mean for banks?

Proper categorization of crypto-assets is crucial, and their treatment depends on whether they fall under Group 1 or Group 2.



Crypto-asset exposures are exempt from the deduction requirement for intangible assets, even if classified as such under International Financial Reporting Standards (IFRS).

Banks must adhere to the market risk framework in Chapter 9 of CAR to be eligible for the treatment of Group 2a crypto-assets.

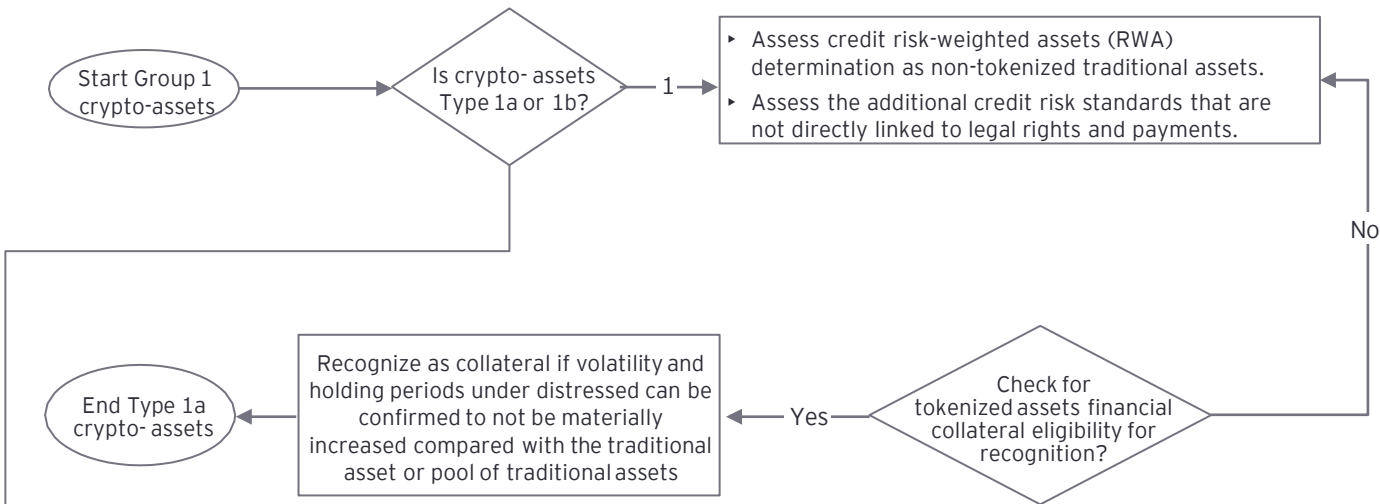


Internal Ratings Based (IRB) approaches cannot be applied to Group 2 crypto-assets.

¹ Please refer to the [OSFI guideline on the regulatory capital and liquidity treatment of crypto-asset exposures](#) for additional information.

Credit risk - capital requirements - Group 1 crypto-assets

GROUP 1A CRYPTO-ASSETS



Group 1a crypto-assets :

- ▶ Subject to the same credit risk-weighted assets (RWA) expectations as non-tokenized traditional assets in the banking book.
- ▶ Treatment based on the assumption that similar legal rights and payment likelihood lead to similar values and credit risk.
- ▶ Banks must assess tokenized traditional assets separately for risks beyond legal rights and payment likelihood.
- ▶ Only tokenized Group 1a assets matching the list of eligible financial collateral under CAR may qualify for recognition as eligible collateral.

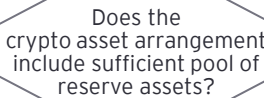
GROUP 1A CRYPTO-ASSETS



1b

GROUP 1B CRYPTO-ASSETS

Address that crypto-asset is redeemable for a predefined amount of reference assets or cash.



Yes

No

- Add sufficient pool of reserves assets to redemption claims
- Analyze specific structures of Group 1b crypto-assets and identify risks
- Capitalize each credit risk exposure separately using credit standards in CAR

- Analyze specific structures of Group 1b crypto-assets & identify risks
- Capitalize each credit risk exposure separately using credit standards set out in CAR

End Type 1b crypto- Assets

Group 2a crypto-assets :

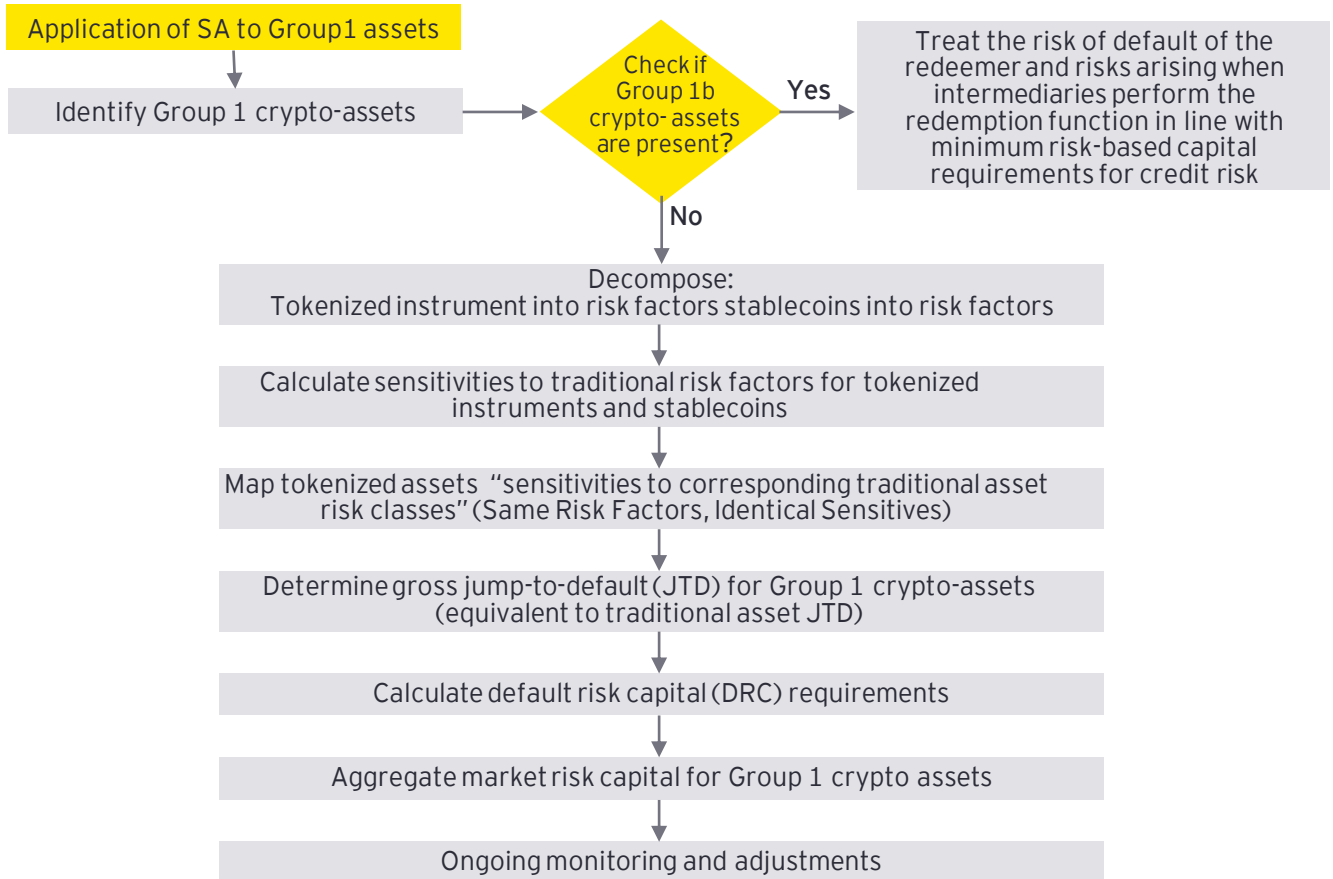
- Must be redeemable for a predefined amount of reference assets or cash, with sufficient reserve assets to meet redemption claims.
- Varied structures, requiring thorough risk analysis for separate capitalization using credit risk standards under CAR guideline.
- Banks responsible for comprehensive assessment and documentation of risks arising from each exposure.



Capital requirements for market risk of Group 1 crypto-assets and provide guidance on their application under the Standardized Approach (SA) and the Internal Ratings-Based (IRB) approach. Group 1 crypto-assets are classified into tokenized instruments and stablecoins. The SA involves mapping these assets to current risk classes, while the IRB approach calculates the aggregate capital requirement by considering default risk capital (DRC) and non-DRC requirements. Differences between tokenized, non-tokenized assets, stablecoins and traditional assets should be accounted for in DRC and loss given default (LGD) estimates.



STANDARDIZED APPROACH

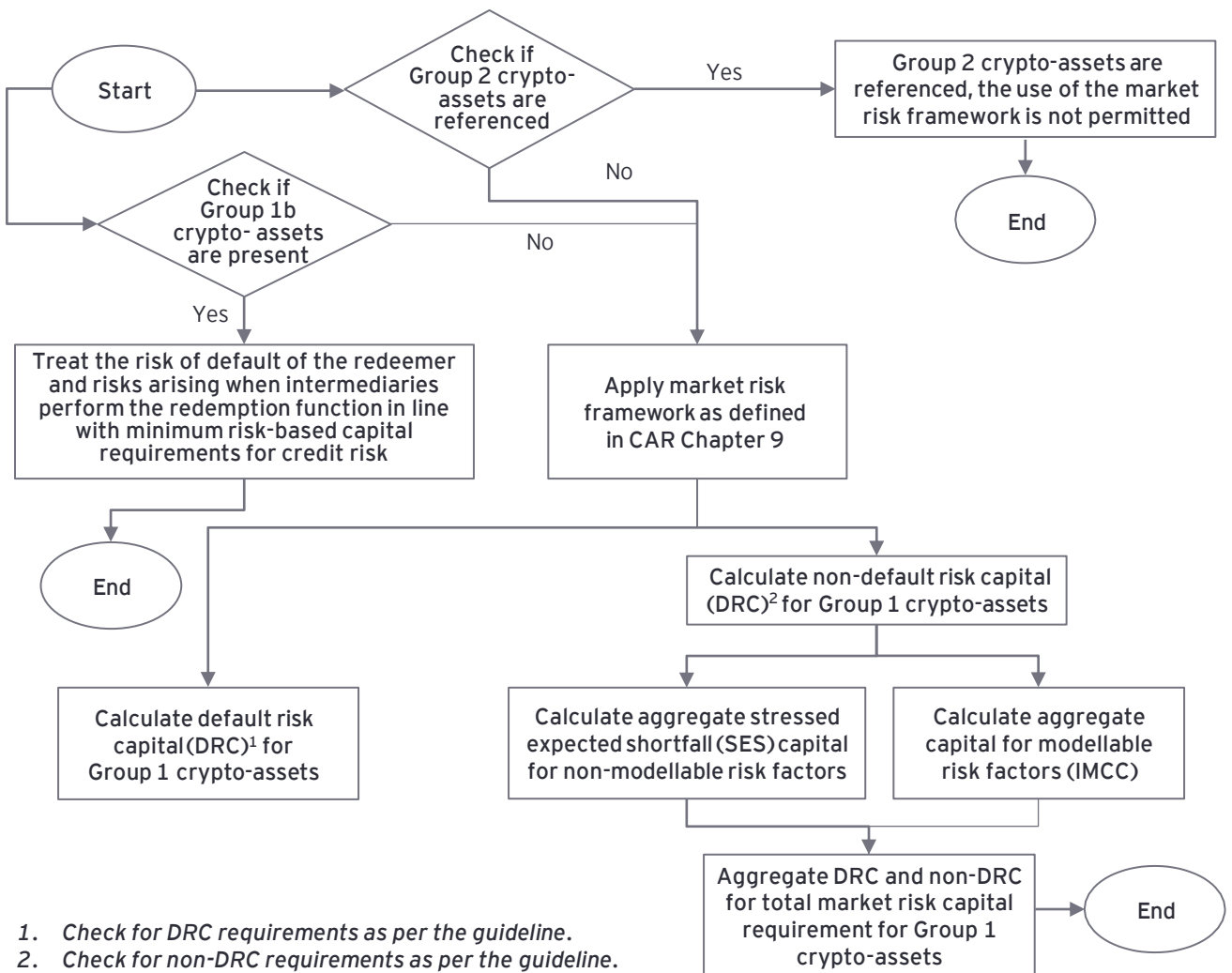


CONSIDERATIONS FOR APPLYING SA TO GROUP 1 CRYPTO-ASSETS

- ▶ Decompose tokenized assets and stablecoins into traditional risk factors
- ▶ Map them to current risk classes for consistent assessment
- ▶ Consider gross JTD equivalent to traditional assets for DRC
- ▶ Handle Group 1b crypto-assets' risk as per minimum credit risk capital requirements
- ▶ Enhance risk management and maintain robust capital adequacy

Market risk - capital requirements - Group 1 crypto-assets

INTERNAL RATING BASED (IRB) APPROACH



Add-on RWA for infrastructure risk - Group 1 crypto-assets



An additional 2.5% risk-weighted asset (RWA) add-on is applied to Group 1 crypto-assets due to the new and potentially risky nature of the underlying technological infrastructure, such as DLT. This addresses the unique risks associated with crypto-assets compared to traditional financial assets. The add-on may be adjusted in the future based on industry and market experience.



Capital requirements – Group 2a crypto-assets

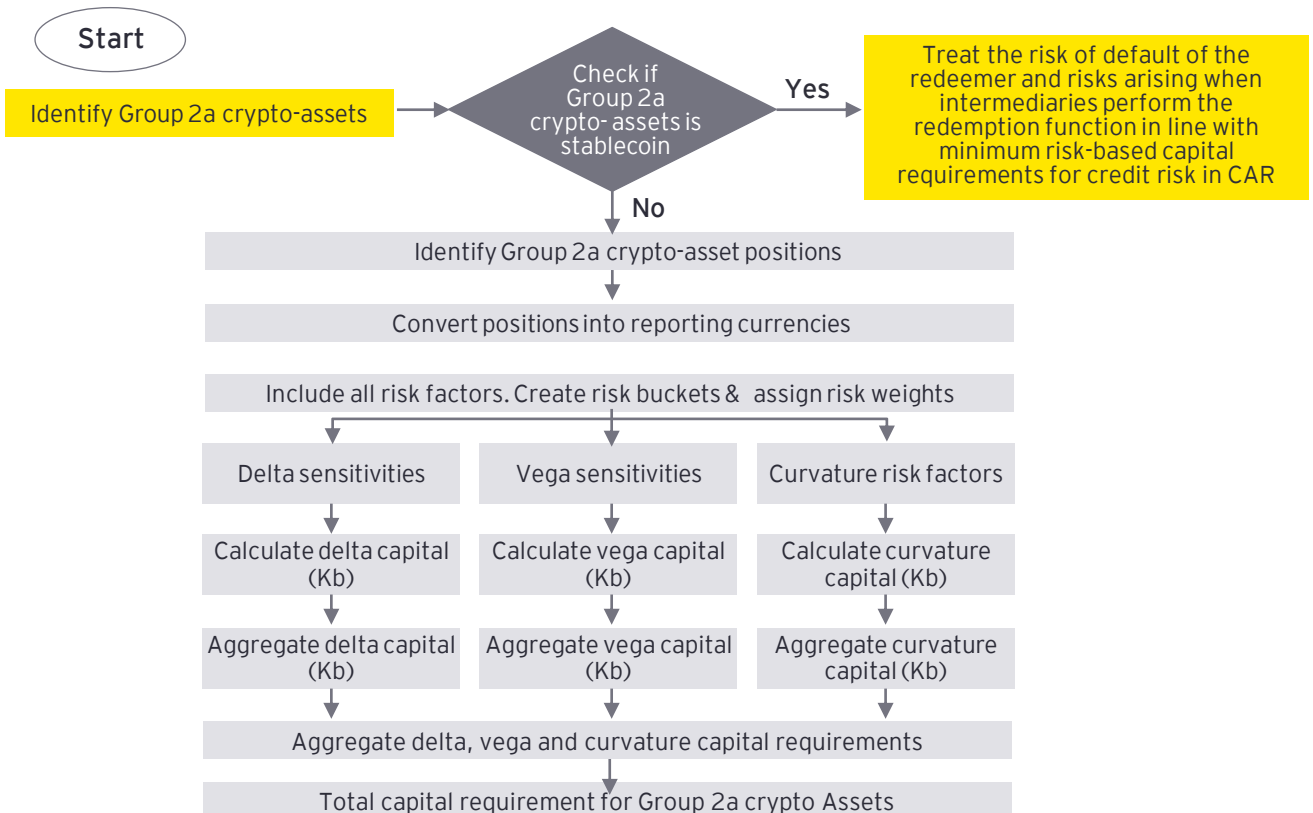
GROUP 2A CRYPTO-ASSETS

- ▶ Group 2a crypto-assets have specific capital requirements and are classified under a separate risk class.
- ▶ Banks must consider all risk factors, including derivatives and off-balance sheet positions, affected by changes in Group 2a crypto-asset prices.
- ▶ Basis risk from hedging relationships must be tracked and capitalized.
- ▶ The computation of sensitivities-based method for Group 2a crypto-assets includes new risk factors (delta, vega, and curvature) and a new bucket structure for individual asset sensitivity.
- ▶ Sensitivity calculations should be separate for long and short positions, with allowances for hedging and diversification benefits.

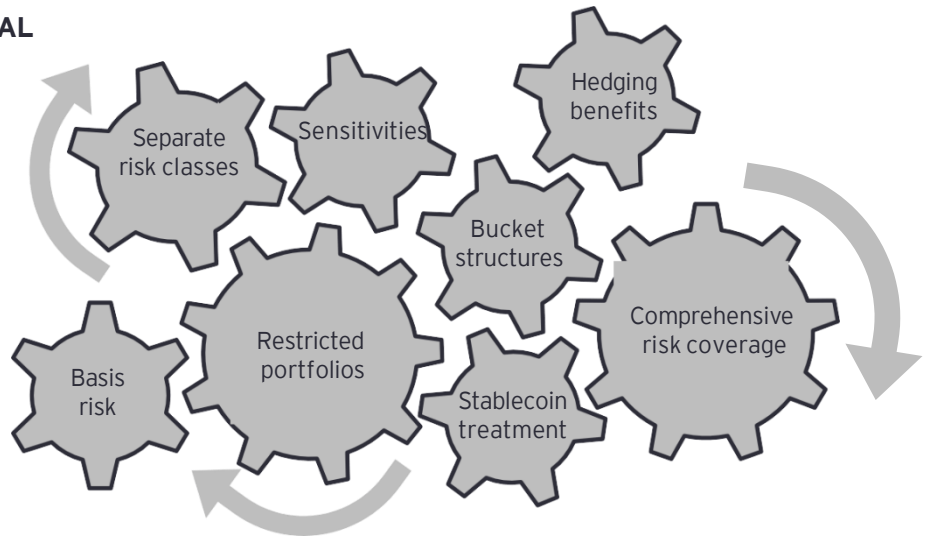
To sum up capital requirements for each risk type (delta, vega and curvature) across all buckets to get the total capital requirement for all Group 2a crypto-assets:

$$\text{Total Capital} = \sum \text{Bucket}_b (\text{Delta Capital Req.} + \text{Vega Capital Req.} + \text{Curvature Capital Req.})$$

CAPITAL CALCULATION FLOW FOR RCYPTO2A ASSETS



DECODING CRYPTO CAPITAL



Total Capital

$$= \sum \text{Bucket } b (\text{Delta Capital Req.} + \text{Vega Capital Req.} + \text{Curvature Capital Req.})$$

$$\text{Delta Capital req. } K_b = \sqrt{\text{Max}(0, \sum_k (WS^2 + \sum_{kl} p_{kl} * WS_k * WS_l), \text{ where}}$$

- ▶ WS^2 represents the delta sensitivity for a specific crypto-asset (k) at a specific tenor.
- ▶ p_{kl} is the correlation coefficient between two different crypto-assets (k and l).
- ▶ WS_k and WS_l are the weights assigned to each crypto-asset in the bucket.



$$\text{Vega Capital req. for } K_b = bp_{kl} * \sum_k |CV_k|, \text{ where}$$

- ▶ bp_{kl} is a constant factor, which is equal to 94% (0.94).
- ▶ \sum_k is the summation over all vega risk factors k within bucket b.
- ▶ CV_k represents the absolute value of the vega risk sensitivity for risk factor k.



$$\text{Curvature Risk Capital req. for } K_b = \text{Max} \rightarrow (K_b^-, K_b^+), \text{ where}$$

- ▶ Curvature risk capital requirement for bucket b is the capital requirement for the specific Group 2a crypto-asset in bucket b based on curvature risk.
- ▶ K_b^- is the sum of the absolute values of all negative curvature risk sensitivities within bucket b.
- ▶ K_b^+ is the sum of the absolute values of all positive curvature risk sensitivities within bucket b.

GROUP 2B CRYPTO-ASSETS

No separate trading book and banking book treatment. This treatment is intended to capture both credit and market risk, including CVA risk. This approach should be reported as part of the bank's credit RWA.

$$CET\ 1\ deduction = \text{Max}[\underbrace{abs(long\ exposure)}, \underbrace{abs(short\ exposure)}]$$

CAPITAL DEDUCTION



Group 2 crypto-assets

RWA for each separate crypto-asset to which the bank is exposed

Short positions

Banks will be responsible for demonstrating the materiality of risks under the supervisory review and whether risks are materially underestimated. In those cases, the capital add-on will be calibrated by requiring banks to calculate aggregate capital requirements under the market and CVA risk framework and to use this amount if the result is higher than the capital deduction above.

MAXIMUM POSSIBLE LOSS



Derivatives

The exposure value of its underlying crypto-assets

Leveraged derivatives

Upward adjusted exposure value for leveraged derivatives (if any).

Adjusted value = exposure value * leverage factor



Group 2 crypto-assets

Internal Ratings Based (IRB) approaches cannot be applied to Group 2 crypto-assets.

No Credit Risk Group 2a crypto-assets are subject to the Default Risk Charge (DRC) capital requirement.

Crypto-asset to be treated as Group 2a with the sensitivities approach, the bank must adhere to the market risk framework.

The regulatory capital treatment set out below also applies to the bank's credit RWA:

- ▶ Funds of Group 2b crypto-assets (e.g. Group 2b crypto-asset ETFs) and other entities, the material value of which is primarily derived from the value of Group 2b crypto-assets
- ▶ Equity investments, derivatives or short positions in the above funds or entities

Groupe 2 exposure limit

- ▶ Banks' Group 2 crypto-assets exposure must stay within 1%-2% of Tier 1 capital.
- ▶ Exposures exceeding the 1% threshold will face Group 2b crypto-asset capital requirements until adherence is restored. Exceeding 2% leads to all Group 2 crypto-assets facing Group 2b. capital requirements.

Capital requirements for credit valuation adjustment risk

Minimum risk-based capital requirements for CVA risk are to be applied to crypto-asset derivatives exposures and material and fair-valued securities financing transactions (SFTs) referencing crypto-assets, as described in CAR:

1a

Subject to the same expectations to determine CVA RWA as non-tokenized traditional assets (i.e., the rules set out in the market risk chapter of CAR).

1b

Derivatives linked to Group 1b crypto-assets will be subject to the same expectations for calculating CVA RWA as non-tokenized traditional assets, as outlined in CAR guideline in the market risk chapter.

2a

Group 2a crypto-assets conform to CAR Chapter 8 expectations, with the use of BA (Basic Approach) - CVA required for derivatives and SFTs referencing these assets.

2a

The capital requirement for CVA related to Group 2b crypto-assets remains consistent with the overall capital requirements for Group 2b crypto-assets.

Capital requirements for operational risk

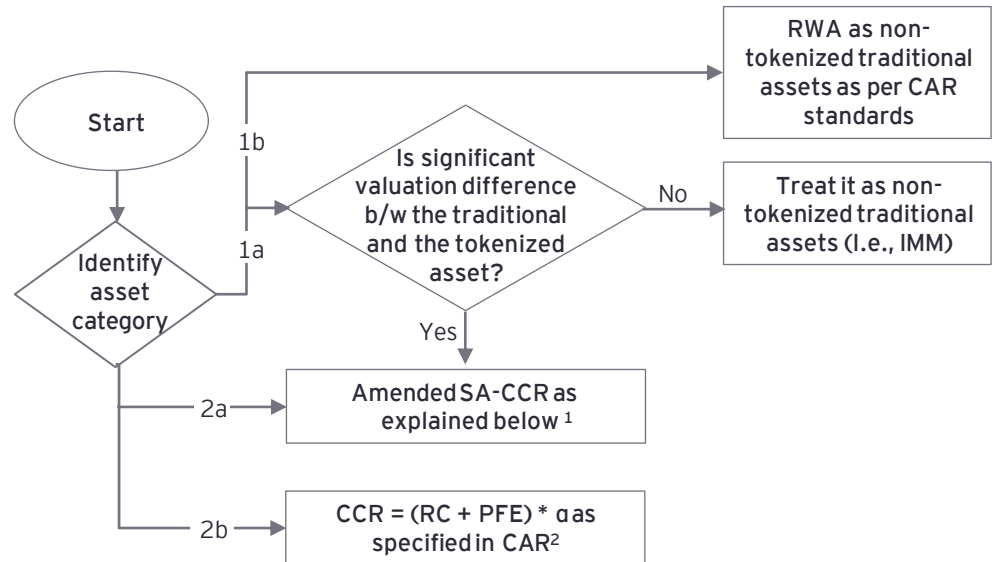


Operational risk from crypto-asset activities is covered by the operational risk standardized approach. This includes Business Indicator for income and expenses and Internal Loss Multiplier for operational losses resulting from crypto-asset activities.



Capital requirements for counterparty credit risk (CCR)

Banks should use the comprehensive approach formula from the SA's credit risk mitigation for SFTs as per CAR Chapter 4. Only tokenized Group 1a crypto-assets on the eligible collateral list qualify for recognition; Group 1b, Group 2a, and Group 2b crypto-assets are not eligible and require the same haircut as non-traded equities in SFTs.



¹ Amended SA - CCR 2a crypto-assets:

Derivatives of Group 2a crypto-assets follow the SA-CCR rules with specific amendments:

- ▶ The SA-CCR considers legally enforceable netting for replacement cost (RC) calculations
- ▶ A new asset class "crypto" is introduced for potential future exposure (PFE) add-on calculations, aligned with the foreign exchange asset class structure but with different parameters as follows:
 - i. Separate hedging sets are used for each cryptocurrency priced in applicable fiat currencies or in another Group 2a cryptocurrency.
 - ii. The supervisory factor for cryptocurrency-fiat currency and cryptocurrency-cryptocurrency pairs is 32%, and the supervisory option volatilities are set at 120%.
 - iii. The adjusted notional is determined by expressing the crypto-asset's notional in the domestic fiat currency of each bank. In cases of cryptocurrencies priced in other cryptocurrencies, the larger of the two adjusted notionals applies.
 - iv. The calculation of the supervisory delta adjustment and maturity factor for the "crypto" asset class remains consistent with other asset classes.
 - v. The PFE add-ons for "crypto" hedging sets are aggregated by summing up, similar to other asset classes.

² CCR 2b crypto-assets - derivatives exposure



Counterparty credit risk for derivatives linked to Group 2b crypto-assets is calculated as: $CCR = (RC + PFE) * \alpha$

- ▶ RC = Sum of replacement costs for derivative exposures related to Group 2b crypto-assets within eligible and enforceable netting sets.
- ▶ PFE = 50% of the total gross notional amount N for derivative exposures related to Group 2b crypto-assets.
- ▶ α = Alpha factor specified in CAR.
- ▶ Netting sets should be split into two sets: one containing derivative exposures related to Group 2b crypto-assets and another containing derivatives related to other assets.

Application of the LCR and NSFR frameworks to crypto-assets

The classification and calibration of LCR outflow and inflow rates, as well as NSFR available stable funding (ASF) and required stable funding (RSF) factors for crypto-assets and crypto-liabilities depend on their structure and commercial function, and a bank's exposure. The treatment varies based on whether they are tokenized claims on a bank, stablecoins or other crypto-assets.

Tokenized claims on a bank

01

Group 1a tokenized claims on a bank should be treated as an unsecured funding instrument when they satisfy below conditions along with subject to consideration as mentioned in new guideline:

- i. Issued by a regulated and supervised bank
- ii. Represent a legally binding claim on the bank
- iii. Redeemable in fiat currency at par value
- iv. Have a stable value supported by the creditworthiness and asset-liability profile of the issuing bank rather than a segregated pool of assets

Value-referenced crypto-assets and other

02

Group 1b and certain Group 2 crypto-assets that are fully collateralized by a segregated pool of underlying assets that do not count towards the bank's stock of HQLA should be treated similarly to securities, subject to the following considerations:

- i. Issuing bank of stablecoin with binding claim:
 - a. 100% LCR outflows if redeemable within 30 days
 - b. Reduced LCR outflows allowed if backed by non-eligible HQLA, subject to specified haircuts
 - c. Assets supporting stablecoin value assigned minimum RSF factor based on earliest redemption date
- ii. When a bank holding stablecoin on balance sheet:
 - a. Non-HQLA subject to at least 85% RSF in NSFR, no LCR inflows
 - b. Exception for stablecoins with contractual maturity, resulting in fiat currency inflow within 30-day or 1-year horizon; avoid assuming early redemption option

Other crypto-assets

03

The treatment of non-qualifying Group 2 crypto-assets aligned with other non-HQLA in LCR and NSFR, with specific considerations:

- i. Bank holding other Group 2 crypto-assets or loans in these assets: 100% RSF in NSFR, no inflows from liquidation, redemption or maturity
- ii. Borrowed other Group 2 crypto-assets on unsecured basis with obligation to return within 30 days: 100% outflow rate unless settled from bank's unencumbered inventory of the same assets
- iii. Borrowings denominated in other Group 2 crypto-assets: 0% ASF in NSFR

Additional crypto-assets requirements and treatment

Leverage ratio requirements



- ▶ Off-balance sheet crypto-asset exposures use a 100% conversion factor for calculating the exposure measure.
- ▶ Crypto-assets are included in the leverage ratio exposure measure based on their financial reporting value and relevant accounting treatment.
- ▶ For Group 1b crypto-assets, banks engaged in the crypto-asset network, promising to purchase assets from non-member holders, must include the total value of off-balance sheet crypto-assets that could be obligated for purchase.

Large exposures requirements



Crypto-assets for large exposures are treated similarly to other exposures based on B-2 Large Exposure Limits guidelines.

Large exposure

- ▶ Large exposure limits are applied to each counterparty or connected group based on the risk-based capital framework.
- ▶ If a crypto-asset exposes a bank to default risk from multiple counterparties, exposure to each is calculated separately.

Liquidity risk requirements



Crypto-asset exposures for LCR and NSFR requirements should align with established approaches for traditional equivalents while factoring in additional risks and limited historical data. Treatment draws on LCR and NSFR principles but necessitates further guidance to address the distinctive risks posed by crypto-assets.

Treatment as high-quality liquid assets (HQLA)



Group 1a crypto-assets can be classified as HQLA if both their traditional and tokenized forms meet LCR criteria: for instance, tokenized bonds meeting HQLA criteria temporarily residing on a distributed ledger. Yet, Group 1b and Group 2 crypto-assets should not be deemed HQLA.

Foreign bank branch deposit requirement



Crypto-asset exposures should not be considered qualifying assets under Guideline A-10, and therefore cannot be included in the calculation of the foreign bank branch deposit.

Key takeaways

A woman in a grey shirt and glasses is standing and presenting to a group of people seated around a table in a meeting room. She is holding a tablet and gesturing towards a whiteboard. The room is dimly lit with some bokeh lights in the background. A yellow rectangular bar is visible on the right side of the image.

Lack of historical data

Historical data for some crypto-assets may be limited, making it difficult to accurately assess their risk profiles and calculate appropriate capital requirements.

Regulator oversight

Banks must be prepared for potential oversight by OSFI, which can override classification decisions if there is disagreement on the assessments made by banks.

Data management

Banks need robust systems for data management, especially considering the vast amount of data required for calculating capital and liquidity requirements for various crypto-assets.

Valuation and price volatility

The valuation of crypto-assets can be challenging due to price volatility, lack of standardized pricing sources and potential illiquidity in certain markets.

Banking/trading book boundary

Determining the allocation of crypto-assets between the banking book and trading book, particularly for Group 1 and Group 2a crypto-assets, can be complex due to different market risk rules and boundary criteria.

Use of internal models

While internal models are allowed for some crypto-assets under CAR, they cannot be applied to Group 2 crypto-assets, limiting the flexibility in risk modeling and assessment.

Regulatory compliance

Banks must ensure compliance with OSFI's regulatory guidelines for crypto-asset capital treatment. The need to maintain accurate records and documentation to demonstrate compliance may add operational burden.

Risk considerations

Regardless of the approach (simplified or comprehensive), banks must consider credit valuation adjustment (CVA), counterparty credit risk (CCR), operational risk, leverage and large exposure risk associated with crypto-asset exposures. Managing and quantifying these risks can be challenging due to the unique nature of crypto-assets.

Complexity in classification

Banks face challenges in categorizing crypto-assets into different groups (Group 1 and Group 2) based on the classification conditions outlined in Annex 1. The evolving nature of crypto-assets and their diverse characteristics make the classification process intricate.

Ongoing assessment

Banks need to continuously assess the compliance of crypto-assets with classification conditions. The dynamic nature of the crypto market demands constant monitoring and adaptation to changing conditions.

How can EY help with Crypto Capital Requirements?

CRYPTO ASSET CLASSIFICATION AND COMPLIANCE

Develop a comprehensive classification framework that considers evolving conditions. Implement an automated compliance monitoring system. A well-defined framework supported by technology can ensure accurate classification and ongoing compliance, reducing the risk of misclassification



Portfolio allocation

We can help you develop an algorithmic approach for dynamic allocation of crypto-assets between the banking and trading books. An algorithmic approach offers more timely and accurate allocation, aligning with varying market risk rules and maintaining capital efficiency.

Valuation techniques

We use a combination of market-based, income-based and cost-based valuation methods to address price volatility and illiquidity. Diverse valuation approaches offer a deep view of the value of crypto-assets, mitigating the impact of price fluctuations.

Data enrichment

We work with data providers to enhance data coverage and accuracy for crypto-assets with limited historical data. Improved data quality supports more informed risk assessments, even for assets with limited historical information.

Modeling and analytics

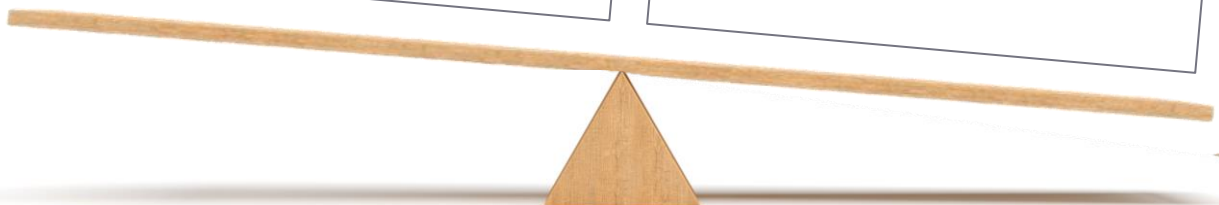
We can help you develop advanced internal models that adhere to regulatory restrictions, enabling accurate risk assessment. A customized model allows banks to factor in unique characteristics of different crypto-assets, enhancing risk assessment precision.

Risk management strategy

We'll work with you to design customized risk assessment methodologies for different crypto-assets, integrating CVA, CCR, operational risk, etc. Tailored risk models help banks understand and quantify the risks associated with each crypto-asset type, aiding in better risk management decisions.

Customize/enhance risk policies and frameworks

We'll help enhance the bank's existing policies, procedures and risk assessment outcomes for crypto-asset exposures or activities. This can be achieved by establishing new standards.



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