Basel III: Comparison of Standardized and Advanced Approaches
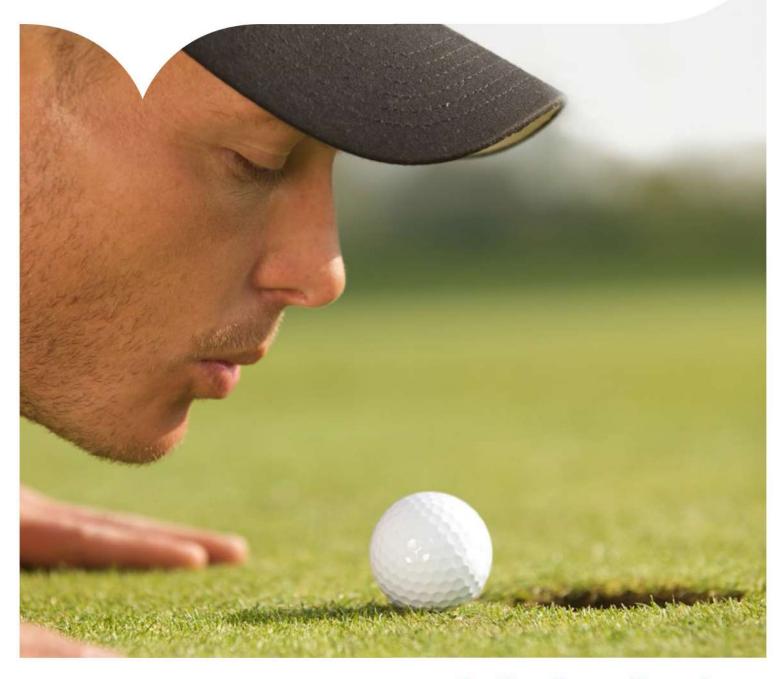
Implementation and RWA Calculation Timelines

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1. Executive Summary

In an effort to continue to strengthen the risk management frameworks of banking organizations and foster stability in the financial sector, the Basel Committee for Banking Supervision (BCBS) introduced, in December 2010, *Basel III: A global regulatory framework for more resilient banks and banking systems*. Subsequently, in July 2013, US regulators introduced their version of the BCBS framework, the Basel III US Final Rule[1].

The Final Rule, which outlines the US Basel III framework, details two implementation approaches:

- The standardized approach
- The advanced approaches

To help banking clients understand what this means to their businesses, Capgemini has compared and evaluated both approaches, based on:

- Implementation timelines as mandated by regulation
- Risk-weighted asset (RWA) calculations for credit
- Market and operational risks
- Applicability to banks of all sizes—large or small

A Glass Half Full

While the standardized approach of Basel III introduces a more risk-sensitive treatment for various exposure categories than that of Basel II, the advanced approaches add another layer of complexity, by requiring that applicable banks employ more robust and accurate internal models for risk quantification.

In order to perform an as-is and to-be analysis of the capital framework, it is important to understand the similarities and differences between these two approaches. This is particularly important for banks intending to progress from the standardized approach to the advanced approaches, as a result of growth or ambition for a more accurate and sensitive representation of the risks they face.

Capgemini tends to see these new rules and regulations as a glass that is half full—an opportunity for long-term growth, rather than a burden on existing resources.

From Complexity to Compliance

By providing end-to-end solutions from initial strategy and development to ground-level implementation, Capgemini is uniquely qualified to help clients cross the bridge from complexity to compliance. With a depth of domain expertise and industry-leading technological capabilities, Capgemini partners with clients to effectively guide them along a path of sustainable growth, while meeting regulatory requirements.

2. Introduction

In July 2013, the Board of Governors of the Federal Reserve System, the Office of the Comptroller of the Currency (OCC), and the Federal Deposit Insurance Corporation (FDIC), published in the Federal Register, the Final Rules, which outline the US Basel III capital framework. Based on comments these rules consolidate three separate notices of proposed rulemaking (NPR)—the Basel III NPR, the Standardized Approach NPR, and the Advanced Approaches NPR—in addition to selected changes.

The standardized and advanced approaches contain some noticeable and significant differences, including using prescribed risk weights under the standardized approach, whereas the advanced approaches require the implementation of models based upon a bank's experience with its internal rating grades. Banking organizations with consolidated assets valued at greater than $250 billion or foreign exposure greater than $10 billion, are mandated to use the advanced approaches in addition to the standardized approach. All other banking organizations applicable under the Final Rule are mandated to use the standardized approach.

The standardized approach proposal incorporated elements of the Basel II standardized approach, as modified by the 2009 enhancements, certain aspects of Basel III, and other proposals in consultative papers published by the BCBS. Highlights of the standardized approach under the Final Rule include:

- More risk-sensitive treatments for equity exposures, derivatives, repo-style transactions, and certain commercial real estate exposures
- Use of the gross-up approach or a new simplified supervisory formula approach (SSFA) for securitization exposures
- Capital benefits for cleared derivatives and repo-style transactions involving a central counterparty (CCP)
- Qualitative and quantitative disclosure requirements for banking organizations with $50 billion or more in consolidated assets

The advanced approaches proposal incorporated elements of Basel III and requirements introduced by BCBS in the 2009 enhancements and subsequent consultative papers. Highlights of the advanced approaches under the Final Rule include:

- Enhancement of internal models methodology (IMM) for counterparty exposures and new credit valuation adjustment (CVA) capital charge
- Capital requirements for cleared transactions with qualified or non-qualified central counterparties
- Increased asset value correlation multiplier for exposure to certain financial institutions
- Introduction of SSFA for securitization exposures
- Removal of references to external credit ratings

This paper compares the standardized and advanced approaches for their applicability, implementation timelines, and risk-weighted asset (RWA) calculations for credit and operational risks. In addition, it offers a comparison of RWA calculations for market risk for standardized and advanced approaches banking organizations. The timelines provided correspond to RWA calculations only because capital adequacy requirements have separate timelines. The remaining sections of this paper are organized as follows:

- Section 3 reviews the applicability and timelines for the different rules
- Section 4 discusses the mechanics of RWA calculations for the two approaches under different risk types
- Section 5 offers concluding remarks

3. Applicability & Timeline

The Final Rule applies to national banks, state member banks, federal savings associations, top-tier bank holding companies (BHCs) domiciled in the United States with $500 million or more in consolidated assets, and top-tier savings and loan holding companies (SLHCs) domiciled in the United States (other than those substantially engaged in insurance underwriting or commercial activities). Additionally, it applies to applicable subsidiaries of foreign banking organizations (FBOs).

3.1. Standardized Approach

The effective date for implementation of RWA calculation for the standardized approach is January 1, 2015.

The standardized approach is applicable to all the entities described above—in other words, all banking organizations to which the Final Rule applies. This means that advanced approaches banks (as described in the following section) are subject to the standardized approach, in addition to the advanced approaches.

The effective date by which to implement RWA calculations for the standardized approach is January 1, 2015. Applicable subsidiaries of FBOs have until July 21, 2015 to implement RWA calculations.

3.2. Advanced Approaches

The advanced approaches apply to entities that are subject to the Final Rule and that have:

- Consolidated assets greater than $250 billion or
- Balance sheet foreign exposures greater than $10 billion

The effective date by which to implement RWA calculations for the advanced approaches was January 1, 2014. Applicable subsidiaries of FBOs have until July 21, 2015 to implement RWA calculations.

One important note: Beginning January 1, 2015, advanced approaches banks that have completed their respective parallel runs are required to determine compliance with minimum capital requirements, based on the lower of each capital ratio calculated under both standardized and advanced approaches.

3.3. Market Risk Rule

The effective date for implementation of RWA calculation for the advanced approaches was January 1, 2014.

The market risk rule applies to banking organizations that have aggregate trading assets and liabilities equal to:

- 10% or more of total assets or
- Equal to or greater than $1 billion

The effective date by which to implement this rule is the same as the corresponding date to implement the standardized and advanced approaches for RWA calculations—January 1, 2014 for advanced approaches banks and January 1, 2015 for standardized approach banks.

4. Risk-Weighted Asset Calculations

This section outlines the mechanics of risk-weighted asset calculations for both standardized and advanced approaches banking organizations. This description is divided into the broad categories of credit, market, and operational risk.

4.1. General Formula

Standardized Approach Banking Organizations

$$RWA = \text{Credit Risk RWA} + \text{Market Risk RWA (if applicable)}$$

Credit risk RWAs include risk-weighted assets for general credit risk, cleared transactions, default fund contributions, unsettled transactions, securitization exposures and equity exposures. General credit risk involves consideration of general risk weights, off-balance sheet exposures, OTC derivative contracts, cleared transactions, guarantees, credit derivatives, and collateralized transactions.

Advanced Approaches Banking Organizations

$$RWA = \text{Credit Risk RWA} + \text{Market Risk RWA (if applicable)} + \text{Operational RWA}$$

Credit risk RWAs include risk-weighted assets for general credit risk, securitization exposures, and equity exposures. General credit risk involves consideration of wholesale and retail RWA as well as the counterparty credit risk of repo-style transactions, eligible margin loans, OTC derivative contracts, cleared transactions, unsettled transactions, guarantees, and credit derivatives.

4.2. Credit Risk

The following subsections describe and compare the various components of RWA calculations for standardized and advanced approaches banks. It should be noted that a market risk bank—a bank for which the market risk rule is applicable, as described in Section 3.3—must, under the market risk rule, exclude from its calculation of risk-weighted assets for credit risk, the risk-weighted asset amounts of all covered positions.

General Risk Weights vs. IRB Risk-Based Capital Formula

Standardized Approach Banks

For a standardized approach bank, general risk weights are prescribed for every type of exposure under the Final Rule to determine the credit risk RWA amount. Standardized approach banks are required to determine exposure amounts for each on-balance sheet exposure, each OTC derivative contract, and each off-balance sheet commitment, trade and transaction-related contingency, guarantee, repo-style transaction, financial standby letter of credit, forward agreement, or other similar transaction that is not an unsettled transaction, a cleared transaction, a default fund contribution, a securitization exposure or equity exposure other than an equity OTC derivative contract.

These exposure amounts must be multiplied by the risk weight appropriate to the exposure, based on the exposure type or counterparty, eligible guarantor, or financial collateral. Exhibit 1 highlights the general risk weights for each exposure type.

Exhibit 1: General Risk Weights under the Standardized Approach

Exposure	Applicable Risk Weight
Sovereign Exposure	Risk weights for non-US sovereigns, based on the Organization for Economic Cooperation and Development (OECD) country risk classification (CRC)
Multilateral Development Banks (MDBs)	0% risk weights for listed MDBs and 100% for others
Government-Sponsored Enterprise (GSE)	20% risk weight to non-equity exposure to GSE and 100% risk weight to preferred stock issued by GSE
Depository Institutions and Credit Unions	20% for US-based, correlated to CRC for foreign banks
Public Sector Entities (PSE)	20% risk weight for general obligations and 50% for revenue obligations (domestic), based on CRC for foreign PSE
Corporate Exposure	100% risk weight, including exposure to securities firms
Residential Mortgages	50% risk weight for first-lien mortgage satisfying certain criteria, 100% for others
Pre-sold Construction Loans and Statutory Multifamily Mortgages	50% or 100%
High Volatility Commercial Real Estate Exposure (HVCRE)	150% risk weight
Past Due Exposures	150% risk weight to exposure not guaranteed or secured (except a sovereign exposure or residential mortgage) if it is 90 days or more past due

The exposure amount for off-balance sheet items is calculated by multiplying the contractual amount by a credit conversion factor (CCF). Such items include commitments, contingent items, guarantees, certain repo-style transactions, financial standby letters of credit, forward agreements, credit-enhancing representations, and warranties.

Advanced Approaches Banks

An advanced approaches bank is required to classify its exposures broadly into wholesale, retail, securitization and equity exposures. Retail exposures are further classified into residential mortgages (RM), qualified revolving exposure (QRE), or other retail exposure (ORE). Wholesale exposures are further classified into corporate exposures, HVCRE exposures, sovereign exposures, OTC derivative contracts, repo-style transactions, eligible margin loans, eligible purchased wholesale exposures, cleared transactions, default fund contributions, unsettled transactions, and eligible guarantees or eligible credit derivatives.

For non-defaulted wholesale exposures[2] and segments of non-defaulted retail exposures, the internal ratings-based (IRB) risk-based capital formula is applied in order to calculate the respective credit risk capital (and RWAs) per the following:

For non-defaulted wholesale exposures:

$$K = [LGD \times N(((N^{\wedge}(-1)(PD) + \sqrt{R} \times N^{\wedge}(-1)(0.999))/\sqrt{(1-R)}) - (LGD \times PD)]$$
$$\times((1 + (M - 2.5) \times b)/(1 - 1.5 \times b))$$

For non-defaulted retail exposures:

$$K = [LGD \times N(((N^{\wedge}(-1)(PD) + \sqrt{R} \times N^{\wedge}(-1)(0.999))/\sqrt{(1-R)}) - (LGD \times PD)]$$

Where,

K: capital requirement

LGD: loss given default

PD: probability of default

N: cumulative distribution function for standard normal variable

N^{-1}: inverse cumulative distribution function for standard normal variable

R: non-defaulted exposure correlation factor

M: effective maturity

b: maturity adjustment

Hence, for wholesale and retail exposures:

$$RWA = \sum [K \times EAD \times 12.5]$$

Where,

EAD: exposure at default

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2 Non-defaulted wholesale exposures do not include eligible guarantees and eligible credit derivatives that hedge another wholesale exposure, IMM exposures, cleared transactions, default fund contributions, unsettled transactions, and exposures to which the bank applies the double default treatment

Additionally, it should be noted that for repo-style transactions and eligible margin loans, the bank can either factor collateral into LGD estimates or use unsecured LGD and determine EAD using:

- Collateral haircut approach
- Simple VaR methodology (netting sets only)
- Internal models methodology (IMM)

IMM exposures also have a modified method for calculation of RWA.

OTC Derivatives

The following exhibit highlights methodologies used to calculate exposure for OTC derivative contracts under the standardized and advanced approaches.

Exhibit 2: Exposure Calculations for OTC Derivatives under the Standardized and Advanced Approaches

Standardized Approach	Advanced Approaches
• Exposure = net current credit exposure + potential future exposure (PFE)	• EAD for OTC derivative contracts is determined using either the current exposure methodology or internal models methodology
• PFE = notional principal x conversion factor	• For collateralized OTC derivatives, either LGD is adjusted to account for collateral or EAD is adjusted using the collateral haircut approach
• Adjustment for collateralized transaction using the simple approach or collateral haircut approach	• Clearing member bank's EAD = exposure x scaling factor
• Separate treatment for credit default swaps (CDS)	• Separate treatment of credit derivatives
• Equity derivative RWA calculated using the simple risk-weighted approach (SRWA)	• Equity derivatives are treated the same as equity exposure; if the internal models approach (IMA) is used, then capital must also be calculated for counterparty credit risk by treating it as a wholesale exposure
	• Credit valuation adjustment RWA = capital requirement (K) x 12.5; K is determined using the simple CVA approach or advanced CVA approach

Cleared Transactions

The following exhibit highlights methodologies used to calculate exposure and RWAs for cleared transactions under the standardized as well as advanced approaches.

Exhibit 3: RWA Calculations for Cleared Transactions under the Standardized and Advanced Approaches

Standardized Approach	Advanced Approaches
• Trade Exposure = net exposure + fair value of collateral posted in a manner that is not bankruptcy remote • Clearing member: 2% risk weight multiplied by the trade exposure amount to a qualified central counterparty (QCCP) • Clearing member client: 2% risk weight multiplied by the trade exposure as a clearing member client, if the collateral posted is bankruptcy-remote, otherwise 4% • For non-QCCP, the risk weight is generally 100% • Two alternative methodologies for RWA amounts for default fund contribution	• Trade exposure = EAD (calculated using methodology for OTC derivatives or repo-style transaction) + collateral posted • Risk weight calculation is the same as in standardized approach • RWA for default fund contribution to non-QCCP = default fund x 1,250% • Two alternative methodologies for RWA amounts for default fund contribution to QCCP

Unsettled Transactions

The following exhibit highlights methodologies used to calculate RWAs for unsettled transactions under the standardized as well as advanced approaches.

Exhibit 4: RWA Calculations for Unsettled Transactions under the Standardized and Advanced Approaches

Standardized Approach	Advanced Approaches
• Additional capital against the risk of unsettled transactions involving securities, foreign exchange instruments, and commodities • DvP/PvP*: RWA = PFE** x risk weight (based on days after contractual settlement date) • Non-DvP/non-PvP: RWA = amount owed to the bank x risk weight (based on counterparty); risk weight = 1,250% if the bank has not received its deliverables by the fifth business day	• Same as the standardized approach for DvP/PvP • Non-PvP/non-DvP: Current fair value of deliverables treated as wholesale exposure; the bank may use 45% loss given default (LGD) or 100% risk weight; risk weight = 1,250% if the bank has not received its deliverables by the fifth business day

* DvP: delivery-versus-payment; PvP: payment-versus-payment
** PFE: potential future exposure

Securitization Exposure

The following exhibit highlights methodologies used to calculate RWAs for securitization exposures under the standardized as well as advanced approaches.

Exhibit 5: RWA Calculations for Securitization Exposures under the Standardized and Advanced Approaches

Standardized Approach	Advanced Approaches
• Banks subject to the market risk rule may use the simplified supervisory formula approach (SSFA) • Banks not subject to the market risk rule may use the gross-up approach	• Major approaches are the supervisory formula approach (SFA) and the SSFA

Equity Exposure

The following exhibit highlights the RWA calculation methodologies for equity exposures under the standardized as well as advanced approaches.

Exhibit 6: RWA Calculations for Equity Exposures under the Standardized and Advanced Approaches

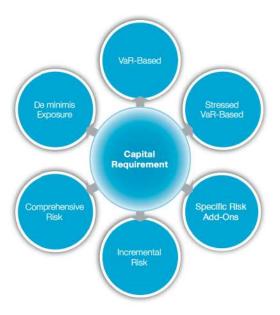| Standardized Approach	Advanced Approaches
• Simple risk-weight approach (SRWA) for equity exposures that are not exposures to investment funds • Investment fund equity exposure risk-weighted using the full, simple modified, or alternative modified look-through approaches	• SRWA or internal models approach (IMA) for equity exposures that are not exposures to investment funds • Investment fund equity exposure risk-weighted using the full, simple modified, or alternative modified look-through approaches

Guarantees and Credit Derivatives

The following exhibit highlights methodologies used to recognize credit risk mitigation benefits under the standardized as well as advanced approaches.

Exhibit 7: Recognition of Credit Risk Mitigation Benefits under the Standardized and Advanced Approaches

Standardized Approach	Advanced Approaches
• A bank may recognize the credit risk mitigation benefits of an eligible guarantee or eligible credit derivative, by substituting the risk weight of the protection provider for the risk weight assigned to the exposure	• A bank may recognize the credit risk mitigation benefits of an eligible guarantee or eligible credit derivative by using the PD substitution approach, loss given default (LGD) adjustment approach, or the double default treatment

4.3. Market Risk

The following exhibit shows the various components for calculating the capital requirement for market risk. The market risk rule does not explicitly distinguish between standardized and advanced approaches banks and has its own applicability criteria, as mentioned in Section 3.3. The only exception is in the case of securitization exposures, as mentioned later in this section.

The market risk RWA is calculated as follows:

$$RWA = K \times 12.5$$

Where,

K: dollar risk-based capital requirement

The relevant risk categories for market risk are interest rate, credit spread, equity price, foreign exchange, and commodity price.

For standardized approach banks the VaR-based capital requirement equals the greater of the:

- Previous day's VaR-based measure (99% confidence level and 10 business-day holding period)
- Average of daily VaR-based measures for each of the preceding 60 days, multiplied by a factor based on backtesting results

The stressed VaR-based capital requirement equals the greater of the:

- Most recent stressed VaR measure
- Average of stressed VaR-based measures for each of the preceding 12 weeks, multiplied by a factor based on backtesting results

Specific Risk Approaches

- **Internal models satisfying certain criteria.** If a VaR-based measure captures a specific risk for one or more portfolios, then no specific risk add-ons are required.
- **Standardized measurement method.** For debt, equity, and securitization positions, the specific risk add-on is the product of the absolute value of the current fair value of each long or short position and the appropriate risk-weighting factor. To calculate the risk-weighting factor for a securitization position, a non-advanced approaches bank can either use the SSFA approach or assign a factor of 100%.
- **Incremental risk.** Measures the incremental charge for default and migration risks for non-securitized products (99.9% confidence level for one-year horizon).
- **Comprehensive risk.** Measures the incremental charge for correlation trading portfolios (99.9% confidence level for one-year horizon).
- **Market risk RWA calculation for advanced approaches banks.** Same as above, with one exception. Those banks must use the SFA, if applicable, under the standardized measurement method for measuring the specific risk add-on for securitization positions.

4.4. Operational Risk

Operational risk requirements are only applicable in the case of advanced approaches banks. The basic RWA formula remains the same as that of market risk.

If a bank *does not* qualify to use operational risk mitigants, then:

- Capital requirement = operational risk exposure – eligible operational risk offsets

If a bank *does* qualify to use operational risk mitigants, then capital requirement is the greater of:

- Operational risk exposure adjusted for operational risk mitigants – eligible operational risk offsets
- 0.8 x (operational risk exposure – eligible operational risk offsets)

Qualifying operational risk mitigants include insurance that is provided by an unaffiliated company and is explicitly mapped to a potential operational loss event or any mitigant for which the agency has given prior approval.

5. Conclusion

Banks Must Face Risk Head On

The Final Rules specifying the US Basel III capital framework bring about more risk-sensitive treatment of a bank's exposures. Specifically, the distinction between standardized and advanced approaches banking organizations clearly adds more complexity to the compliance efforts of bigger banks. The use of IRB capital formulas, credit valuation adjustment calculations, internal models, and inclusion of operational risk RWA are just some of the areas that distinguish advanced approaches banks from standardized approach banks.

It is important to understand the costs and benefits of the additional regulations under the advanced approaches. This is especially significant for banks that are growing and expect to progress from standardized to advanced approaches. Moreover, since standardized approach banks can apply to adopt the advanced approaches, it is in their best interests to evaluate the long-term benefits of implementing the same.

Costs and Benefits

Clearly, the additional costs will be reflected in IT system enhancements, the need to maintain data at higher levels of granularity, and the complexity of the calculations involved. The benefits, on the other hand, will include a more accurate representation of the risks banks face, advancement of best practices, and a stable economic environment that encourages long-term profitability.

The analysis required to establish and execute such a long-term strategy is a task banks will want to tackle with a proven and trusted partner. Capgemini is among the world's foremost providers of consulting, technology, outsourcing, and local professional services with more than 130,000 employees in more than 40 countries. It is uniquely-suited to offer banks the tools and expertise to help transform evolving regulatory challenges into regular opportunities—and achieve enduring, sustainable growth.

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