Building a Holistic Capital Management Framework
Embedding the strategic use of capital into banks’ internal cultures will help them gain competitive advantage.

Executive Summary
The 2008 financial crisis induced banks to rethink their capital planning approach and identify new ways to extract shareholder value in an increasingly risk-averse environment. A lower risk appetite and increased regulatory capital requirements have imposed new constraints forcing banks to optimize capital allocations, which in turn have required some difficult business decisions.

We believe capital management is not a one-dimensional problem. Developing a holistic capital management framework is a new imperative for banks.

In this white paper, we examine key developments and highlight the challenges facing banks that are looking to develop a holistic capital management framework. We analyze the impact of regulations on capital planning decisions. We also lay out the capital management value chain, and highlight the need for a strategic transformation of existing processes and systems.

Where Does Capital Generate Value?
A Strategy & Performance Management Perspective
Performance management allows businesses to decide which product or business lines to direct its resources to, so as to maximize profitability. ROE is a common way to measure the performance of a bank. However, ROE does not incorporate the risk element that the equity is exposed to, and hence it can be misleading. Risk-adjusted performance management is a method to allocate risks across the business on a consistent basis in terms of their contribution to capital requirements.

Given the constraints of capital availability and the cost considerations, banks must assess whether promoting certain business lines that generate high returns is indeed generating value for the business if the investment has to be financed at a greater cost and by meeting more stringent regulatory requirements.

To maximize shareholder wealth, banks undertake capital allocation – a process of planning, allocating and managing capital for a variety of products to
ensure that the return on investment outstrips the costs. To achieve success, banks must be able to appropriately balance growth, risk and return to remain in line with the interests of investors.

Clearly, capital management should be increasingly embedded in evaluating decision-making, costs, performance and incentives per group, business and product. Performing such an analysis would require identifying and continuously monitoring a set of metrics that use the same set of enterprise data and are consistent and comparable across business groups, lines and products. However, metrics are often unique to each business line or product, which makes comparisons difficult. The solution is a standardized performance management framework.

**How Much Capital? An Economic Perspective**

When considering a performance management framework that captures the risk underlying assets, one way of measuring that risk is by understanding economic capital requirements. Economic capital (ECap) represents an estimate of the worst possible decline in the institution’s capital at a specified confidence level, within a chosen time horizon. Hence, it can be used to gauge the amount of risk a bank is exposed to and can be seen as capital that a bank needs to hold on its balance sheet to support those risks and stay solvent. Since ECap incorporates not just a bank’s capital position but also the underlying risk, it is a very useful tool for capital management.

When considering a performance management framework that captures the risk underlying assets, one way of measuring that risk is by understanding economic capital requirements.

Banks have had to increasingly focus on two areas:

- Which risk-driven business area/project should we channel our capital to?
- Across business areas, is the capital sufficient to absorb the risk of insolvency?

ECap can support this dual agenda as it can be used to develop risk-driven profitability measures to compare businesses but also produce a single
aggregate figure for all risk types, products and business units.

The risk adjusted return on (economic) capital (RAROC) is the normative, risk-based leverage measure that allows comparison between different business areas and also enables banks to determine whether high return assets and investments are contributing toward higher economic capital. It addresses the shortcomings of regulatory capital, which is usually calculated at the company level and doesn’t allow comparative analytics to be performed across business areas. Executives can use RAROC to make better decisions on complex problems. It can be used ex post to decide which investments are generating target profits or ex ante to set transaction prices or determine which business lines deserve more resource injections that could include capital. A similar performance measure related to ECap is economic value added (EVA). EVA is positive if the absolute return on an asset is greater than the risk-weighted cost of capital needed to fund it. Hence EVA identifies which projects, products or business lines create value for shareholders.

An increased focus on risk management and the regulatory spotlight on banks’ internal risk management practices have prompted a revival in ECap model adoption. It also has an important role under Basel’s Pillar II as it represents a bank’s view of the amount of capital required to support its business activities.

ECap metrics bring their own challenges, and banks are weighing the benefits against the challenges (see Figure 2).

Incorporating an ECap analysis into the capital management framework will, however, allow banks to gain a more holistic view of their needs and generate significant value in the long run.

### Figure 2

<table>
<thead>
<tr>
<th>Benefits</th>
<th>Challenges</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complements regulatory capital measures</td>
<td>May require a rethink of IT strategy</td>
</tr>
<tr>
<td>Allows risk data to be aggregated at group level</td>
<td>ECap models traditionally difficult to back-test</td>
</tr>
<tr>
<td>Allows for comparison between businesses/products</td>
<td>Management complexities from parallel use of ECap and RegCap metrics</td>
</tr>
</tbody>
</table>

ECap is being increasingly used to measure capital buffer. Banks must maintain it in addition to regulatory capital to avoid falling short of regulatory requirements. ECap metrics are flexible and can be calculated across geographies and businesses and hence, can present the aggregate view of risk that regulators seek. ECap metrics can be calculated at a business level. This allows for risk-adjusted performance measure and comparison between different businesses which helps management decide capital allocation for businesses.

Intensive back-testing of models is needed to ensure the robustness of the model, but this could be challenging due to unavailability of data and longer time horizons.

Regulatory capital is reported to the regulator at group level while ECap metrics can be used at business/product level.

A Regulatory Perspective

In contrast to economic capital, the framework for regulatory capital is laid out by regulators and is meant to ensure the soundness of the banking system, protect depositors and prevent financial crises. Increased capital and funding costs along with the heavy investment in infrastructure to
deal with regulatory changes have put a strain on profitability and brought capital management to the forefront.

Despite the extended implementation timeframe, many financial institutions are tackling the balance sheet consequences of the new regime only now. An overview of all regulations that may affect responses in capital management is provided in Figure 3. The regulatory initiatives have tried to tackle various elements of the banking system and their multipolar nature requires that banks conduct impact analysis on different fronts.

**Basel III and Beyond**

**Components of Capital**

BASEL III has introduced stricter capital standards by increasing the quality of capital that banks are to set aside for risk management as well as a stricter definition of what constitutes regulatory capital. The total capital ratio\(^3\) under Basel III remains 8% of RWA but its composition has changed.

Regulatory capital comprises Common Equity Tier-1 capital (including Core Tier 1) and Tier 2 but common equity requirements have increased. Basel III also introduced a capital conservation buffer of 2.5% of RWA as well as a countercyclical capital buffer in the range of 0 to 2.5% to address excessive build-up of systemic risk.

Under Basel III, the predominant source of Tier 1 capital is common shares and retained earnings. In order to qualify as common equity, capital has to be recognized under both accounting and insolvency law as “own funds” and must not have obligatory distributions. Share premium accounts can be considered common equity only if the

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**Overview of Regulatory Timelines**

<table>
<thead>
<tr>
<th>Theme</th>
<th>Sub-Theme</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
<th>2019</th>
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<tr>
<td>Capital</td>
<td>Core Tier 1</td>
<td>4.5%</td>
<td>4.5%</td>
<td>4.5%</td>
<td>4.5%</td>
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<tr>
<td></td>
<td>Tier 1</td>
<td>6.0%</td>
<td>6.0%</td>
<td>6.0%</td>
<td>6.0%</td>
</tr>
<tr>
<td></td>
<td>Tier 2</td>
<td>2.0%</td>
<td>2.0%</td>
<td>2.0%</td>
<td>2.0%</td>
</tr>
<tr>
<td></td>
<td>Countercyclical Buffer</td>
<td>0.625%</td>
<td>1.25%</td>
<td>1.875%</td>
<td>2.5%</td>
</tr>
<tr>
<td></td>
<td>Conservation Buffer</td>
<td>0.625%</td>
<td>1.25%</td>
<td>1.875%</td>
<td>2.5%</td>
</tr>
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<td>Liquidity</td>
<td>LCR</td>
<td>70%</td>
<td>80%</td>
<td>90%</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>NSFR</td>
<td>Observation period</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td></td>
<td>Liquidity Risk tools</td>
<td>Tools include Concentration of funding, Contractual maturity mismatch, LCR by significant currency, available unencumbered assets</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leverage</td>
<td>Leverage ratio</td>
<td>Tracking ratio’s components</td>
<td>3%</td>
<td>3%</td>
<td>3%</td>
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<tr>
<td>Trading Book</td>
<td>FRTB</td>
<td>BIS Consultative Documents were issued in 2012/2014 for FRTB. Updated Market Risk standards issued in January 2016. The deadline for this framework to be implemented is in 2019</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Banking Book</td>
<td>IRRB</td>
<td>BIS Consultative Documents were issued in 2015 for IRRB. Updated Basel IRRB standards were issued in April 2016. Banks are expected to implement the standards by 2018</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pillar 2 Requirement</td>
<td>ICAAP, ILAAP, Stress Testing (CCAR, DFAST)</td>
<td>For US IHC’s that meet the asset threshold(total consolidated assets of $50 billion or greater) are required to submit first capital plan to Federal Reserve in January 2017</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Despite the extended implementation timeframe, many financial institutions are tackling the balance sheet consequences of the new regime now.
shares that gave rise to the premia were eligible as common equity. As for instruments other than common equity to be included in Tier 1, specific criteria have been introduced to ensure these are loss absorbent on a going-concern basis. In particular, this means that dated and innovative Tier-1 instruments will be phased out. Regulatory adjustments set out in Basel do not apply in fair value changes of additional Tier 1 and Tier 2 capital instruments that are recognized on the balance sheet. Guidance from each competent authority is available on what is considered an incentive to redeem for additional Tier 1 capital (e.g., a call option combined with an increase in the credit spread of the instrument if the call is not exercised or a call option to convert the instrument into shares if the call is not exercised).

Deductions from capital (e.g., for goodwill and intangibles, minority interests, deferred tax assets, defined benefit pension fund assets, shortfall of provisions to expected losses for IRB institutions) and prudential filters have been harmonized on a global basis and are applied almost entirely to common equity. Regulations require that banks deduct investments in capital instruments of other institutions from the class of component of capital for which the capital would qualify if issued by the bank itself.

**Tougher capital requirements will primarily impact areas such as sales and trading, securitizations, securities lending and OTC derivatives.**

Basel III has simplified and reduced Tier 2 capital by eliminating Upper Tier 2 from the capital structure. Tier 2 capital ensures loss absorption in case of liquidation (going-concern) since banks must hold further debt securities that can convert to equity in times of stress.

Tougher capital requirements will primarily impact areas such as sales and trading, securitizations, securities lending and OTC derivatives. Institutions may choose to exit capital-intensive areas of business (OTCs, commodities) where levels of return on higher capital levels dilute shareholder value.

Higher capital costs have forced banks to reconsider their business models unless they are able to manage both elements of the capital ratio. Thus, comprehensive capital management that incorporates capital planning, calculation and strategic optimization has become inevitable for all banks. Banks will need to measure and monitor the quality of capital defined under the regulatory initiatives, and this may require an analysis of data and system requirements to support the review.

**Counterparty Credit Risk (CCR)**

During the 2008 crisis, two-thirds of the losses generated from counterparty risk was due to credit spread and market variables movements. So the CCR charge under Basel II, which was not originally designed to consider market movements of the exposure, has now been redesigned by the Basel Committee to adopt a further capital charge, the CVA charge, to cover for credit spread volatilities and market volatility of the CCR. The CVA charge materially increases the capital requirements for OTC derivatives activities and has attracted considerable attention from banks and regulators alike.

Standard and advanced CVA are the two common methods used by banks to calculate the CVA capital charge. The standardized approach allows less flexibility in incorporating market implied data. It should theoretically result in a higher capital charge compared to the advanced approach due to regulatory implied alignment between risk weights and external ratings and other more conservative VaR calibrations. However, the standardized approach also removes complexities associated with market risk VaR methodologies/IMM approval and testing. The standardized CVA risk capital charge methodology requires the development of a number of heuristic approaches to estimate the exposure at default, the discounted notional of single name and index CDS hedges, the effective maturity of the transaction with the counterparty and the maturity of the hedges for index CDS.

Calculation of the advanced CVA RWA is a market risk computation and may be used by institutions that have regulatory approval to use the internal model method (IMM) for CCR and specific VaR model approval for market risk capital. If the VaR models use a sensitivity-based approach, the credit spread values in the 1st and 2nd order sensitivities are the current levels as of valuation dates for both the stressed and unstressed VaR capital component of the advanced CVA. Hence, no additional period of stress may be required for credit spread parameters in determining future
counterparty EE profiles. Calculation of effective EPE profiles and EAD are common on both methods and may not have been subject to any adjustments arising from credit protection that the bank intends to include as an eligible hedge in the CVA risk capital charge. However, the use of other types of credit risk mitigation such as collateral or netting set that reduce the effective EPE and EAD amounts in the CCR framework can be maintained when feeding the risk capital charge. Also, the VaR model for eligible CDS and CDS swaptions should capture their nonlinear risk. Banks will need to assess which model is best suited and evaluate if legacy systems are capable of supporting those models.

Market Risk
Interest Rate Risk in the Banking Book (IRRBB)
The post-crisis period witnessed record low interest rates to boost the economy. Policy makers are now concerned about the impact when interest rates rise. Hence banks are being urged to consider keeping more capital aside to deal with increases in interest rates. Based on a set of qualitative principles largely backed by stress testing and internal audits, banks are required to manage rate fluctuations. The Basel Committee was considering bringing interest rate risk in banking book (IRRBB) under Pillar 1 but it published new standards for IRRBB in April 2016 and concluded that IRRBB will remain (will be captured) in Pillar 2. Banks are expected to implement an enhanced Pillar 2 approach to identify, measure, monitor and report IRRBB. This involves adequate procedures, policies, systems and controls. Banks are also required to assess and measure IRRBB and the impact of interest rate shocks on economic value (NPVs of future cash flows and interest income) of assets, off-balance sheet items and liabilities and on earning-based measures (change to future gains or losses) of the banks.

Fundamental Review of the Trading Book (FRTB)
An analysis of FRTB reveals that it:

- Proposes standardized criteria for defining the boundary between the trading and banking books.
- Places restrictions on changing this classification to provide better alignment in the quantification of capital across the industry as well as reducing arbitrage between banking and trading books.

- Argues for a move from VAR to ES for market risk calculation to capitalize for loss events in the tail of the P&L distribution.
- Provides validation criteria that banks must use to approve the soundness of internal models, and where found inappropriate, banks will be forced to use standardized models.
- The Basel Committee also proposes a revised, more risk-sensitive standardized market approach that includes calculation of the risk sensitivities based method (delta and gamma), the default risk charge and the residual risk add-on.

Banks are being urged to implement a robust risk management framework to identify, measure, monitor and report IRRBB.

Compliance with FRTB would require extensive interaction between multiple desks - trading, market risk, analytics, regulatory reporting, technology, finance, project management and business analysts. This is both time-consuming and expensive. Banks will have to invest heavily in data management, business process reengineering and technology. However, some argue that FRTB provides an opportunity for banks to enhance their system capabilities and replace their legacy IT infrastructure.

Liquidity Risk
The liquidity measures mandated by Basel III aim to reduce reliance on unstable sources of funding, highlight the importance of managing funding costs and encourage banks to review the composition of assets and liabilities on their balance sheets. Liquidity coverage ratio (LCR)\(^4\) and net stable funding ratio (NSFR)\(^5\) will likely drive banks away from sourcing shorter-term funding and toward longer-term funding arrangements. This will also increase the competition for retail deposits, affect funding costs and margins, and result in lower RWAs.

LCR reduces complexity but interpretive guidance is necessary for all banks to follow a consistent implementation approach. Key examples of high quality liquid assets (HQLA) implications that banks will face are as follows:

- Unused portions of eligible HQLA assets, already pledged, that are part of the collateral pool can be used toward the bank’s stock of HQLA with associated haircuts considered.
Where the bank cannot determine which collateral remains unused it may be assumed that these assets are encumbered in order of increasing liquidity value.

- Lower-rated (BBB+ to BBB-) sovereign and central bank securities that cannot be included in the definition of Level 1 assets may be included in the Level 2B assets with a 50% haircut but will not constitute more than 15% of level 2B assets.

The liquidity measures mandated by Basel III aim to reduce reliance on unstable sources of funding, highlight the importance of managing funding costs and encourage banks to review the composition of assets and liabilities on their balance sheets.

- Non-0% risk-weighted sovereign/central bank debt securities included in the Level 1 assets and the amounts of foreign currency exposures should be limited to the jurisdiction of the issuing sovereign/central bank.
- Common equities, which are exchange-traded and are part of a major market index within the home jurisdiction of the bank, should be denominated in the same currency.

NSFR enables better assessment of funding risk across on- and off-balance sheet items, and promotes funding stability by reducing reliance on short-term wholesale funding. This ratio reduces the possibility that a disruption at a bank’s standard source of funding will impact its liquidity position to cause the bank’s failure and trigger systemic risk (Basel Committee). The amounts of available and required funding are calibrated to reflect the presumed degree of stability of liabilities and liquidity of assets. The calibration promotes the use of more stable, long-term sources of funding. This calibration reflects which stable funding type and counterparty is used (e.g., longer term is assumed to be more stable) to fund the resilient credit creation of the asset side of the balance sheet.

The Basel Committee has proposed a set of supplementary monitoring tools to assist supervisors with the analysis of bank-specific and system-wide liquidity risk trends. Additionally, the committee has introduced tools to monitor data on the quantity, type, currency and location of available unencumbered assets. These include market-related monitoring tools that allow monitoring of market-wide information (e.g., market data from debt markets or specific products such as securitized products), financial sector information (to check how the financial sector is reacting to broader market movements) and bank-specific information (to gauge market confidence in and risks associated with specific banks).

**Leverage Ratio**

Basel III introduced a non-risk-based leverage ratio to complement the risk-based capital requirements so as to reduce the excessive buildup of on- and off-balance sheet leverage. This will diminish destabilizing deleveraging exercises during periods of stress. The leverage ratio measures the relationship between the capital base and the assets of an institution. The ratio is designed to put a floor under the buildup of leverage in the banking system as well as to introduce additional safeguards against model risk and measurement errors by supplementing the risk-based capital requirements with a simple, transparent measure of risk. In addition, off-balance sheet positions shall be included in the denominator. In contrast to capital requirement calculation and accounting, collateral and netting for derivative and repo transactions will not be considered. To ensure international comparability of the ratio, it will be adjusted for differences in accounting standards.

The exposure measure is the sum of five components:

- On-balance-sheet exposures, including collateral for derivatives and securities financing transactions but not the corresponding assets as they form the next two points.
- Derivative exposures - accounts for replacement cost, potential future exposure and adjustment for certain collateral.
- Securities financing transaction exposures - accounts for counterparty credit exposure related to repos, reverse repos, securities borrowing/lending and margin lending transactions.
- Other off-balance-sheet items.
- Leverage ratio acts as a backstop measure to the risk-based capital requirements and therefore provides added protection against model risk and measurement error.
The implementation of the leverage ratio will entail changes to regulatory reporting processes and potentially require system changes.

**Revisiting Pillar 2**

The purpose of the second pillar under Basel is to supplement existing regulatory capital requirements for banks’ capital planning process and risk management. Pillar 2 guidance intends to help banks better identify, assess, manage and mitigate risks in their internal capital adequacy assessment process (ICAAP). Pillar 2 should exceed Pillar 1 capital requirements so that all risks are adequately covered. The ICAAP process should be commensurate with the size and complexity of the bank’s business as well as its risk appetite. A supplemental guidance was issued by the Basel Committee to support their ICAAP exercise. It addresses the following areas:

- Risk concentrations.
- Off-balance-sheet exposures with focus on securitization.
- Valuations.
- Sound stress-testing practices.

ICAAP should incorporate stress testing to complement other processes such as setting risk appetite and assessing economic capital so that the bank has the shock absorption capability to adequately protect against severe stress events. The bank’s capital planning should incorporate rigorous and forward-looking stress testing in order to withstand uncertain market conditions and volatility over time. Banks should also assess their capital adequacy under stress conditions against a variety of capital ratios (e.g., RWA, Tier 2).

Banks will be forced to move further away from holding risky and costly assets (e.g., OTC derivatives) on their balance sheet, and will reshape their strategies toward client businesses.

U.S. intermediate holding companies (IHCs) with $50 billion or more in total consolidated assets are subject to assessments by bank regulators to check if the banks have effective capital planning processes and sufficient capital to absorb losses during stressful conditions. The assessment includes the comprehensive capital analysis and review (CCAR) and Dodd-Frank Act stress testing (DFAST).

CCAR evaluates an IHC’s capital adequacy, capital distributions and capital adequacy processes. For the annual CCAR submission, IHCs are required to assess capital adequacy under three supervisory scenarios provided by the FRB (baseline, adverse and severely adverse), as well as at least two internally developed scenarios (baseline, severely adverse). As part of CCAR, the Federal Reserve evaluates whether IHCs have sufficient capital to continue operations through times of economic and financial market stress and whether they have robust, forward-looking capital planning processes that account for their unique risks. As such, banks have to perform key tasks to be compliant with CCAR: conduct stress tests based on relevant scenarios; ensure a control and governance structure is in place to reduce risks; and enable accurate and timely reporting of annual, quarterly and monthly reports.

DFAST is a complementary exercise to CCAR that assesses whether financial institutions have sufficient capital to absorb losses and support operations during adverse economic conditions. A snapshot of the CCAR taxonomy indicates that these developments will significantly increase
### Snapshot of CCAR Taxonomy

#### Schedules that need to be submitted as part of the annual FRT-14A report and financials reporting impact

<table>
<thead>
<tr>
<th>Report Year</th>
<th>Schedule</th>
<th>Constituent Worksheets</th>
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<tbody>
<tr>
<td>FY14A</td>
<td>Summary</td>
<td>Income Statement</td>
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<td>Balance Sheet</td>
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<td></td>
<td>1 Capital - CCAR and 2 Capital - OTS</td>
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<td>Standardized RWA</td>
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<td>Retail Balance and Loss Projections</td>
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<td>Projected OTT for AFS Securities and HTM by Security</td>
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<td>Projected OIT for AFS and HTM Securities by Portfolio</td>
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<td>OTTI Methodology and Assumptions for AFS and HTM Securities by Portfolio</td>
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<td>Projected OCI and Fair Value for AFS Securities</td>
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<td>AFS and HTM Fair Market Value Sources by Portfolio</td>
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<td>Operational Risk: Scenario Inputs &amp; Projections</td>
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#### Measures used against reporting schedules/worksheets

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<tr>
<td>Liquid Assets</td>
<td>FR Y-14A</td>
<td>Summary</td>
<td>Liquid Assets Schedule: Captures details about redemptions and issuances at the Security CUSIP/identifier and Instrument Type level.</td>
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<tr>
<td>Projected OCI and Fair Value for AFS Securities</td>
<td>FR Y-14A</td>
<td>Summary</td>
<td>Projected OCI and Fair Value for AFS Securities Schedule: Captures BHC's granular data on various asset classes, projected OCI and fair value for AFS securities and HTM securities and OTT for securities and OTI for securities for the period.</td>
</tr>
</tbody>
</table>

#### Schedule description and data granularity

- **Legend**
  - **B**: Bank | **C**: Capital | **L**: Liquid Assets | **S**: Suppliers | **V**: Variable
  - **R**: Regulator | **D**: Deposit | **W**: Weighted Assets | **P**: Projected | **A**: Actual

- **Net**
  - Captures the difference between two values, where the value in the numerator is subtracted from the value in the denominator.

- **Actuals**
  - Represents the actual values for the period.

- **Balances**
  - Represents the balance at the end of the period.

- **Financials**
  - Captures financial information for the period.

- **Loans**
  - Captures information related to loans for the period.

### Figure 4

- **Cognizant 20-20 Insights**
  - Page 9
data and reporting requirements. However, there are multiple commonalities between CCAR and DFAST in terms of data, processes and supervision. Hence, there is significant scope for banks to align processes to gain synergies while ensuring compliance with both, provided they reassess their current operating model.

Both regulations should serve to inform the Federal Reserve and the general public of how these financial institutions’ capital ratios might change during a hypothetical set of adverse economic conditions and the same three FRB-provided supervisory scenarios as under CCAR are required of the IHCs for the year-end DFAST.

For institutions with significant trading businesses, extensive data template submissions are required to support supervisory stress tests and analysis of the firm’s trading operations.

A thorough understanding of the CCAR reporting requirements of all regulatory reporting templates will help banks identify the level of data granularity in each schedule and regulatory requirement demand. The regulatory risk taxonomy analysis in Figure 4 (see previous page) will also help banks ensure that the required data is available in an appropriate structure.

**Risk-Based Pricing: A Pressing Imperative**

Risk-based pricing is the alignment of pricing of a trade by reflecting the riskiness of the product in the trade. A borrower’s credit risk determines the price as well as the interest payment, and thus the higher the perceived risk, the higher the fee that should be charged on the OTC trade. Risk-based pricing closely aligns the cost structure with the real costs by incorporating considerations such as cost of capital, cost of funding, expected and unexpected losses, and other allocated expenses to provide a price that maximizes value.

Along with CVA, rising funding costs that affect a firm’s P&L should be included in the valuation of a product - i.e., fair value adjustment (FVA). FVA incorporates the PV of funding cost into the value of the product rather than accruing it over the life of the product. Banks also use fund transfer pricing (FTP) to charge a lending business or desk the cost of raising funds. FTP allows a bank to allocate funding costs to each business unit or product based on how much capital is required for that particular product.

**Recovery and Resolution Plans (RRPs): Lessons from the Past**

The 2008 global financial crisis resulted in new regulations aimed at increasing the resilience of banks; a key focus has been the preparation of a recovery and resolution plan (RRP). The RRP determines the operational procedures related to liquidity crisis solution and thus highlights the need for more effective tools to resolve financial distress. The responsibility of the ongoing monitoring of the emergency liquidity plans lies under the responsibility of treasury, risk and the asset liability committee (ALCO). The RRP should prevent a liquidity crisis from happening, with its actions mainly dependent on the exposures and the systemic importance of the financial institution.

The 2008 global financial crisis resulted in new regulations aimed at increasing the resilience of banks; a key focus has been the preparation of a recovery and resolution plan (RRP).

Banks use stress scenarios for recovery planning purposes. Scenarios range in severity but banks use both internal and external (usually driven by macroeconomic indicators) ones for stress testing in order to estimate the likely future impacts on income statement, balance sheet, RWA, regulatory Tier I common equity, economic capital and liquidity.

RRPs set out what will be expected of banks with regard to planning for a stressed situation that will require a bank to take action to recover or undertake resolution in an orderly manner without the need for public funded support. RRP aims to minimize the adverse impact on the financial system of firms failing to meet their liabilities when they fall due. All the firms are required to provide the authorities with sufficient information to assess the preferred recovery and resolution strategy.

**Challenges and Complexities**

Banks are tasked with the dual agenda of meeting economic and regulatory requirements. They face challenges on four fronts: governance, processes, systems and data. The challenges manifest from these individually, and also due to inefficient interaction between them. To manage
capital effectively, banks need to have stricter governance and oversight to instill shareholder confidence in business strategy and performance. The processes have to be streamlined to reduce complexity and response times, and achieve synergies while integrating functions within teams. Systems and data management need to be overhauled in order to manage capital accurately and in a timely manner. This will allow banks to spend more time analyzing the data to gain insights rather than simply aggregating and reporting data.

**Bringing Order to Chaos: Implementing Effective Capital Management Processes**

In order to effectively manage the indicated challenges, it is important to analyze and fully appreciate the complexity of the capital management value chain in Figure 6 (see next page).

Capital planning and supervision is an enterprise-wide exercise that encompasses various functions within a bank, including strategy and business

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**Key Challenges Related to Capital Planning, Allocation & Management**

<table>
<thead>
<tr>
<th>The Regulatory Agenda</th>
<th>The Economic Agenda</th>
</tr>
</thead>
<tbody>
<tr>
<td>How do I allocate my capital across assets to ensure minimal risk and compliance with regulatory requirements?</td>
<td>How do I allocate my capital across assets to generate the highest risk-weighted return on assets?</td>
</tr>
<tr>
<td>Accurately measure quality of capital to ensure regulatory compliance both across lines of business and on an entity level.</td>
<td>Define risk profile needed to support overall capital planning.</td>
</tr>
<tr>
<td>Accurately capture and monitor leverage.</td>
<td>Obtain accurate risk-based product pricing.</td>
</tr>
<tr>
<td>Have accurate view of asset classification to accurately forecast regulatory capital requirements.</td>
<td>Set risk-adjusted performance measures to drive decision-making.</td>
</tr>
<tr>
<td>Monitor counterparty credit exposure.</td>
<td>Compare performance between different lines of business.</td>
</tr>
</tbody>
</table>

**Challenges**

<table>
<thead>
<tr>
<th>Governance</th>
<th>Process</th>
<th>Data</th>
<th>Systems</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capital planning not adequately responsive due to lack of alignment between senior management.</td>
<td>Difficult to fully utilize capital planning resource due to lack of synergy between business and IT, and between risk and finance.</td>
<td>Defragmented data architecture makes it difficult to capture performance and risk measures both across lines of business and on an entity level.</td>
<td>Difficult to scale systems to address increased modelling requirements.</td>
</tr>
<tr>
<td>Difficult to compare business lines due to lack of standardized metrics or KPIs.</td>
<td>Processes slow, inefficient and prone to human error due to reliance on manual processes.</td>
<td>Degree of data granularity between businesses inconsistent which makes KPIs difficult to design and comparison between businesses difficult.</td>
<td>Systems incapable of supporting increased stress testing requirements.</td>
</tr>
<tr>
<td>Delayed response to resolve identified issues due to absence of ownership and accountability.</td>
<td>Processes cannot be adapted during transformational phases.</td>
<td>Data produced is inaccurate, incomplete and out of date and hence, decisions based on data are unreliable and flawed.</td>
<td>Lack of real time or on-demand data due to system design and performance limitations.</td>
</tr>
<tr>
<td>Decision-making slow due to fragmented and poorly defined approval process.</td>
<td>Processes pose operational risk due to lack of robust control framework.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 5
planning, risk management, finance, front office, compliance, executive management and the board of directors. Capital management requires data and system interactions within the various functions. For instance, in planning for an organization’s overall capital needs, its risk appetite will in part advise an organization – and the risk appetite, in turn, will be facilitated by extensive stakeholder discussions and risk calculations. Similarly, when an organization is monitoring capital risk associated with a line of business, it will seek advice from its control framework in determining how frequently capital needs to be monitored. The firm will also require significant firepower from risk management teams that often make use of sophisticated risk management platforms. A disparate set of processes and systems must come together to support and guide capital management at each step. To enable a successful framework, firms need to rethink their enterprise data management strategy and develop a standardized data dictionary. Banks will also need to strategize and define the target operating model for effective capital management and transform their processes, systems and data infrastructure.

This transformation has largely been ad hoc, reactive and tactical to accommodate the immediate regulatory requirement. Banks need to
engage in strategic rather than ad hoc enterprise-level change programs. Our experience suggests that business and IT transformations are often disconnected and poorly aligned with enterprise-level strategy. Hence, a change that can improve multiple functions often addresses only a few due to lack of relevant stakeholder involvement in the early stages. By the time other functions are involved, implementation deadlines force singular changes, and firms fail to leverage potential synergies. Enterprise-wide change management programs would enable proper integration, address challenges at the outset and avoid workarounds that often create governance issues.

For instance, embedding a strategic transformation process will help banks successfully optimize their regulatory capital and hence optimize RWA. Reviewing current systems and data can help make granular data available to achieve this.

Based on our analysis of the underlying challenges within the capital management process, we propose an efficient IT platform model that facilitates and automates the complex challenges covered in this paper. At the outset, the model collates data from multiple disparate systems in the “enterprise service bus” before transforming it appropriately in the “warehousing layer.”

The transformed data is ready to support various processes underlying capital management. Several of these processes are performed in the core “computation” layer. In particular, the model allows the organization to gauge capital demand, and allows planning and forecasting to be performed on a “dynamic” basis by incorporating the changes within the industry and regulatory landscape.

It is important to recognize that there are various levers within an organization that influence its RWA. The allocation module incorporates these various levers to provide re-optimized capital allocations across LOBs and products and ensure a firm’s RWA is minimized. The capital risk materiality module generates relevant capital risk calculations and advises on the materiality of limit breaches to ensure organizations can be well-prepared. The information must be presented through function-specific dashboards that allow stakeholders to monitor risks and control outcomes.

Roadmap: Strategic Transformation and Implementation of Target Operating Model

<table>
<thead>
<tr>
<th>As-is analysis</th>
<th>Gap identification &amp; recommendations to address gaps</th>
<th>Implementation of optimization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Activities</td>
<td>• Analyze and document as-is state:</td>
<td>• Define data requirements to enable the automation of processes and reporting.</td>
</tr>
<tr>
<td></td>
<td>• Review of IT architecture.</td>
<td>• Design future state by mapping data process based on to-date recommendations.</td>
</tr>
<tr>
<td></td>
<td>• Analysis of interdependency of data and systems.</td>
<td>• Start implementing optimization in systems, data and processes.</td>
</tr>
<tr>
<td></td>
<td>• Test robustness of control framework (including IT controls).</td>
<td>• Ensure business users are adequately informed of change.</td>
</tr>
<tr>
<td></td>
<td>• Review and confirm as-is state with relevant stakeholders.</td>
<td>• Confirmation with relevant stakeholders that requirements have been met post implementation.</td>
</tr>
<tr>
<td>Output</td>
<td>• Documentation of as-is state.</td>
<td>• Target state achieved.</td>
</tr>
<tr>
<td></td>
<td>• Approval from relevant stakeholders.</td>
<td>• Endorsement of target state from relevant stakeholders.</td>
</tr>
<tr>
<td></td>
<td>• Identification of gaps and weaknesses in existing structure.</td>
<td>• Identification of gaps and weaknesses in existing structure.</td>
</tr>
<tr>
<td></td>
<td>• List of prioritized gaps and potential impact of each gap.</td>
<td>• List of prioritized gaps and potential impact of each gap.</td>
</tr>
<tr>
<td></td>
<td>• Recommendations and actions to close gaps.</td>
<td>• Recommendations and actions to close gaps.</td>
</tr>
<tr>
<td></td>
<td>• Cost estimates.</td>
<td>• Cost estimates.</td>
</tr>
</tbody>
</table>

Figure 7
Conclusion

In this increasingly dynamic post-crisis era, banks’ decision-makers will need to work through layers of complexity when implementing a comprehensive capital management strategy. Banks need to perform an in-depth assessment of the existing governance structure, processes, systems and data. Adopting a holistic approach will not only allow banks to improve operationally through streamlined processes, but also help identify the areas where capital is being inappropriately allocated. This will help establish greater predictability on capital demand.

In addition to encouraging greater collaboration between various stakeholders, the change in approach will enable banks to fully utilize existing resources and generate greater return on pre-existing investments and assets. Ultimately, a holistic capital management framework will enable banks to comply with regulations while also ensuring that they generate sustainable value for their shareholders.
Footnotes

1 ROE = Net Income / Capital

2 A certain iteration of EVA can be given by EVA = (Revenues - Costs - Expected Loss - Tax) - (Economic Capital * Cost of Capital Employed)

3 Capital Ratio = Regulatory Capital (Tier 1 + Tier 2) / RWA Assets (Credit, Market, Operational)

4 Liquidity Coverage Ratio = Stock of high quality liquid assets / Net cash outflows over a 30 day period ≥100%

5 Net Stable Funding Ratio = Available amount of stable funding / Required amount of stable funding ≥100%

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### About the Authors

**David Paris** is Governance, Risk & Compliance (GRC) head within the Banking and Financial Services sector for Cognizant Technology Solutions in the UK. He has over 30 years of experience in financial services management and advisory globally, focused on credit, market, liquidity and operational risk management. This includes roles at Wells Fargo Bank, First Interstate Bank, Ernst & Young, Reuters Instinet, IBM and Cognizant. David has an M.B.A. in finance from the American Graduate School of International Management and a degree in Chinese and Russian history from Washington University. He can be reached at [David.Paris@cognizant.com](mailto:David.Paris@cognizant.com).

Guruprasad Chavan is an Associate Director (Consulting Senior Manager) within Cognizant Business Consulting’s BFS Governance Risk and Compliance Practice. He has over 16 years of experience in business/IT consulting and auditing across various areas such as strategy consulting, enterprise-wide risk management, accounting policy, SOX compliance, AML, information security and business continuity management. Guruprasad has in-depth knowledge and experience across various domains within banking and capital markets. He can be reached at [Guruprasad.Chavan@cognizant.com](mailto:Guruprasad.Chavan@cognizant.com).

**Nick Palamaras** is a Senior Manager (Consulting Manager) within Cognizant Business Consulting. He has over 12 years of experience in risk consulting and investment banking. Nick has significant experience across the risk, finance and treasury functions, and with regulatory teams of global investment banks. He has in-depth knowledge of prudential regulation, liquidity risk and Basel (CRDIV and CRR), and has led assignments in the assessment as well as the design and implementation of treasury and liquidity risk management frameworks. Nick is a Chartered Accountant (ACCA) and holds a postgraduate degree in economics and banking. He can be reached at [Nikolaos.Palamaras@cognizant.com](mailto:Nikolaos.Palamaras@cognizant.com).

Zareef Anam is an Associate (Business Analyst) within Cognizant Business Consulting. He has worked on multiple consulting engagements including business transformation, regulatory compliance and operational risk. He can be reached at [Zareef.Anam@cognizant.com](mailto:Zareef.Anam@cognizant.com).

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