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The Future of Stress Testing

An Integrated Framework Aligned to Risk Appetite

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Since the global financial crisis of 2008, financial institutions have invested heavily in enhancing the risk models, processes, data, technology and human resources associated with Comprehensive Capital Analysis and Review (CCAR) frameworks. However, the integration of CCAR analyses into enterprise risk appetite (RA), capital and performance management strategies is still in its early stages.

In particular, many institutions have not used stress testing (ST) analyses and results for purposes such as RA allocation and capital and performance management. Stress test performance metrics are often not aligned with corporate strategies in these areas, as evidenced by monitoring, analytics and reporting frameworks where the integration with ST is not fully developed.

Institutions' original goal in establishing ST processes was to meet regulatory compliance requirements. However, as the focus is now shifting to the capture of efficiency gains and improvements in return on investment, we expect that, going forward, banks will increase their use of ST processes and results in managing RA, capital or performance management.

Aligned decision-making processes, a common set of key performance indicators (KPIs) and integrated monitoring, analytics and reporting should be the common denominator for the convergence of the CEO (Chief Executive Officer), CFO (Chief Financial Officer) and CRO (Chief Risk Officer) offices in shaping the risk profile and financial performance of the institution as expected by regulators.

While linking enterprise-wide (EW) RA metrics to business strategies and risk limits can be as much of an art as a science, we expect banks to further augment the use of ST processes and results for refining risk strategies and EW management of balance sheet and capital actions.

The Evolution of ST

In its first (or "inception") phase—as financial institutions scrambled to comply with CCAR requirements and to put in place the infrastructure, data, reporting and human resources capabilities needed to support immediate objectives—the focus of ST was almost exclusively on capital adequacy. ST results were only rarely used for risk and business decisions.

We have entered a second (or "current state") phase in which institutions, having met basic requirements, are now engaged in refining end-to-end CCAR processes, models and data flows. The greater quantity and specificity of information increases regulators' and shareholders' expectations that data derived from ST can be used for business as usual (BAU) purposes as well as for capital planning. We observe currently a limited use of ST results and processes in risk management activities such as reserving or pricing, but these are still disengaged from the economic capital (EC) or RA processes. This coincides with elevated regulatory and stakeholder expectations for application in capital and business planning, as supervisors shift focus to elements such as "use test," soundness of processes, data and documentation.

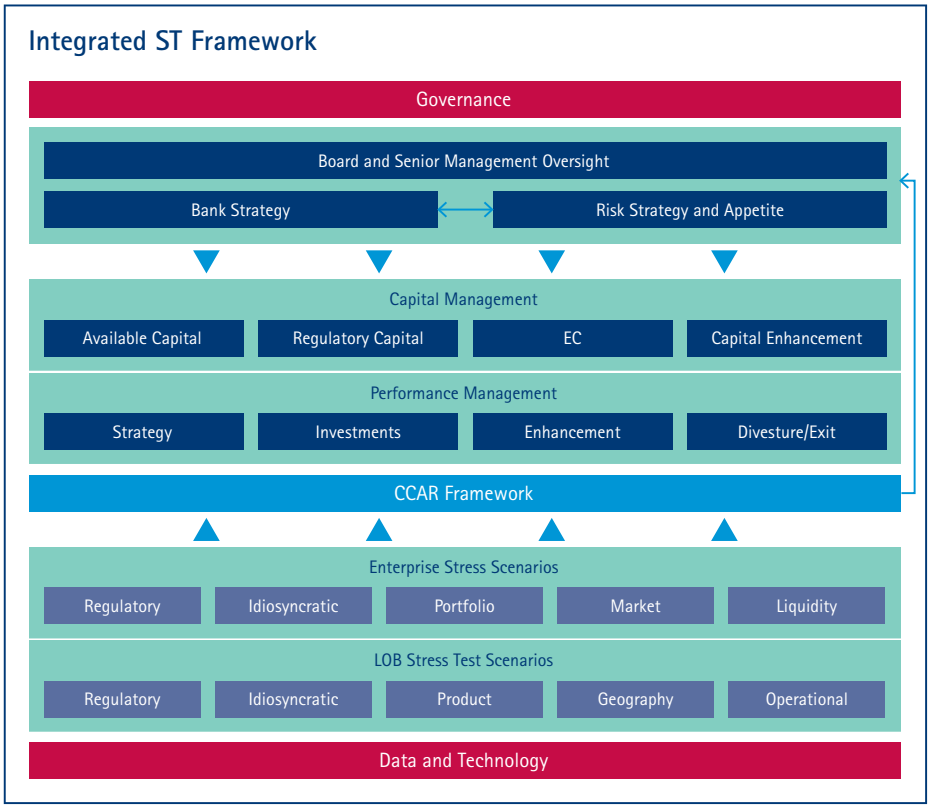
Some institutions have begun the transition to a third (or "target state") phase in which ST scenarios and results are integrated into EW risk and performance metrics. In this phase, we expect sophisticated analytics and reporting to embed ST results into BAU applications, across all lines of business (LOBs) and enterprise functions. Therefore, ST becomes an anchor for strategic planning and the management of RA, closely aligned to EC processes. We further envision that supervisors will take a more holistic view of the CCAR frameworks and leverage integrated frameworks for managing the risk and trajectory of the system.

An Integrated ST Framework

In the target state, institutions should link the bank's capital needs to its strategic plan and RA targets. As seen in Figure 1 below, the ideal framework should embody this linkage.

Figure 1. Integrated ST Framework

An integrated ST framework should link the bank's capital needs to its strategic plan and RA targets.



Key Characteristics

- Integration of LOB and EW scenario-driven outcomes into risk strategies via measuring impact on RA metrics
- Assess business-specific and firm-wide resilience to regulatory and idiosyncratic stress scenarios as well as extreme market and liquidity events
- Refinement/calibration of RA targets and tolerances based on key stress scenarios
- Measure and monitor key risk indicators (KRIs) (e.g., risk limits, capital use) and performance through integrated CCAR/RA metrics, analytics and monitoring capabilities
- Fine-tune risk strategy, capital management and performance decisions via dynamic impact assessment of CCAR and EC results
- Enhancement of risk-adjusted performance within risk tolerances through:
  - Forward-looking capital planning (regulatory and EC)
  - Balance sheet improvement

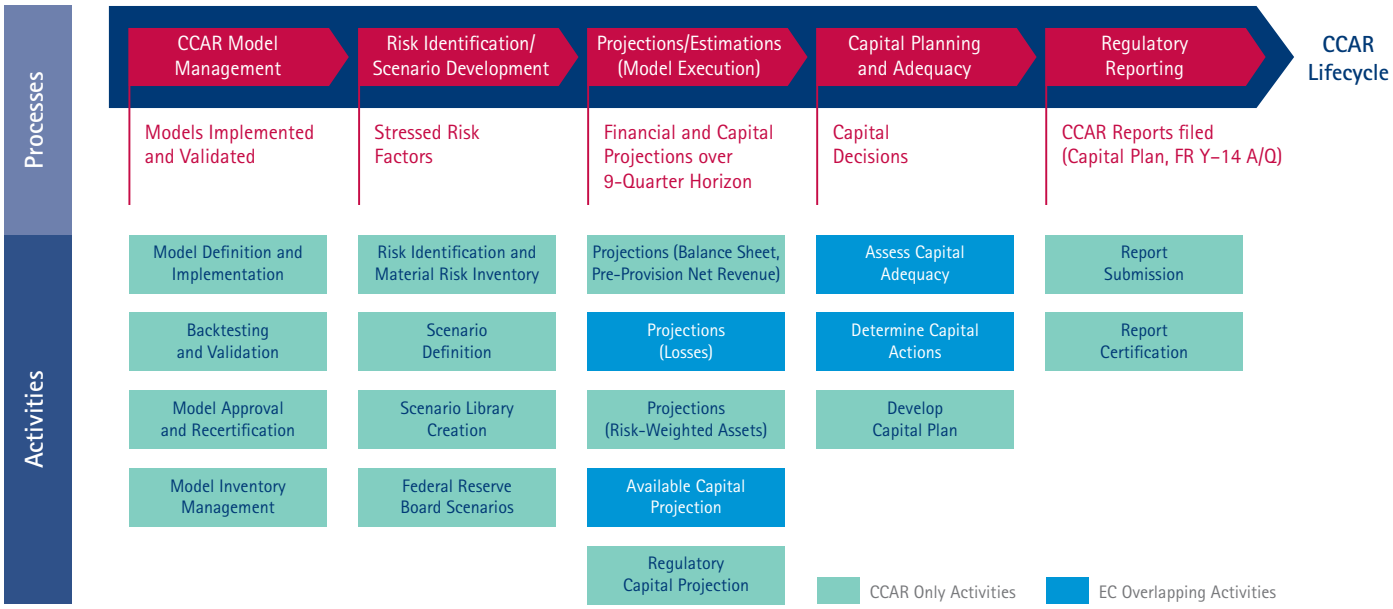
Source: Accenture, January 2017

Integrating CCAR and EC Programs

Reaching this target state requires institutions to integrate, rather than separate, their risk and capital management programs.

Figure 2. CCAR and EC Processes for Integrating Risk and Capital Management

Despite earlier divergence, CCAR and EC can make a powerful combination for integrated risk and capital management going forward.



Source: Accenture, January 2017

As seen in Figure 2 above, the processes for CCAR and EC follow quite different paths, however they can be bridged in context of ever-growing integration aspirations among internal and external stakeholders.

The framework requirements for CCAR are built upon provision and consolidation of end-to-end data, methodology and forecasting components from all LOBs and relevant functions across the enterprise. Capital forecasts for portfolios, LOBs and for the enterprise are based on the institution's business and risk strategy, tested under stressed conditions.

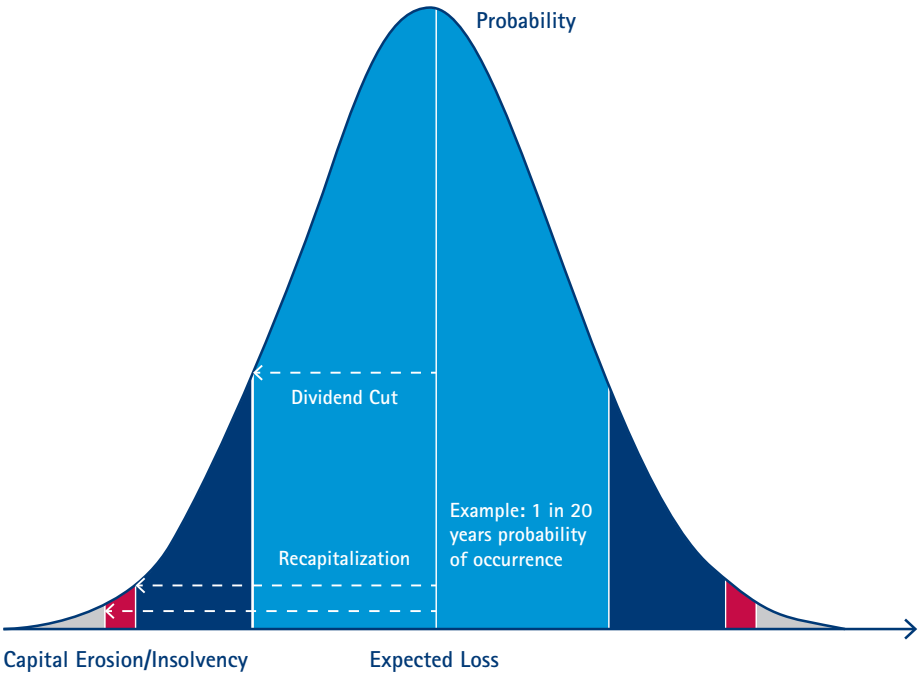
EC processes, in contrast, exclude such stressed forecasts. Unlike CCAR, EC planning typically takes place under a centralized operating model, as the methodology and forecasting requirements do not require the active involvement of different groups across the enterprise.

The results of EC analysis do not provide insights into the consequences of specific stress scenarios or events. This is in sharp contrast to CCAR processes, which identify risks and design scenarios that are pertinent to the size and complexity of the institution; a typical inventory might include 50 to 100 risks.

Another important difference relative to EC is that CCAR processes require a comprehensive data management framework, complete with accounting-quality transaction data and an understanding of data anomalies, while EC computations are made using a hybrid of point-in-time and through-the-cycle risk parameters. These are calculated over a one-year period and invariably cause at least some dilution in results.

Figure 3. Projected Loss Distribution under EC (Illustrative)

CCAR stress tests and scenario analysis at the LOB and enterprise levels can complement EC results for a more holistic view on capital and RA impact.



Source: Accenture, January 2017

The loss distribution sets the EC requirements against probabilities of loss events. On the other hand, in ST we define specific risk drivers and appropriate stress scenarios that have similar likelihood of occurrence, in order to facilitate aggregation of risks and losses at the EW level. Having these sets of results in hand—and then triangulating among them—the Board can decide the level of risks and tolerances that the firm is willing to accept under stressed conditions.

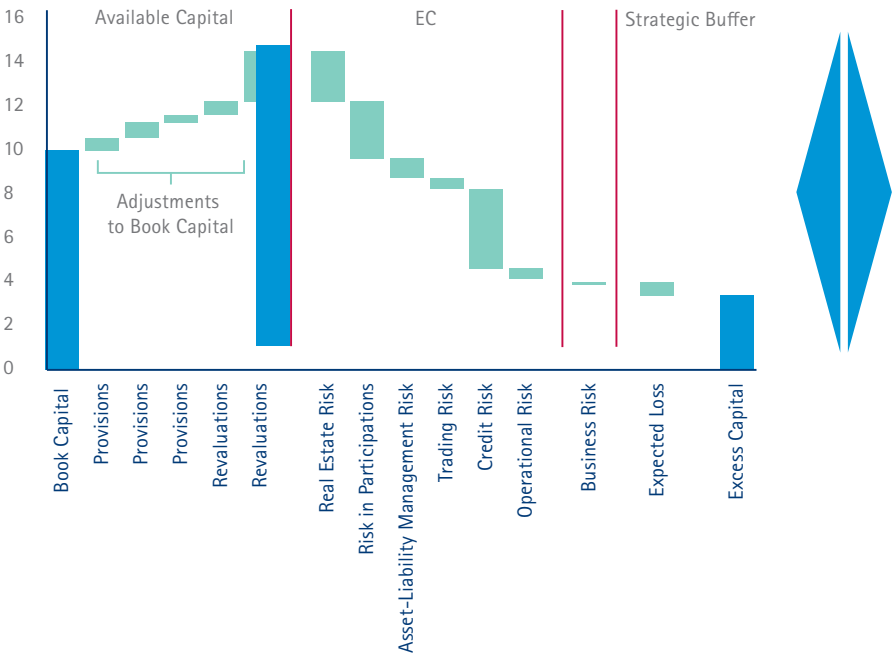
As shown in Figure 4 below, EC allocation coupled with ST enables more realistic RA allocations while shedding light on potential capital shortfalls.

Banks should take steps to have available capital that is sufficient to withstand extreme loss events (such as one-in-1000 year events), leaving a strategic buffer based on the RA set by the Board. A bottom-up calculation of EC supplemented with CCAR stress scenario assessments can help inform the RA targets and tolerances more effectively than stand-alone regulatory capital or EC approaches. Institutions may consider linking RA targets and tolerances to capital, as a ratio of strategic buffer to EC or strategic buffer to risk-weighted assets (RWA) under stressed conditions.

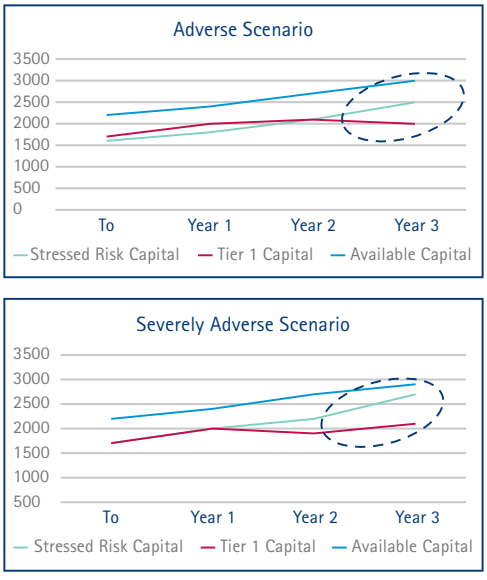
Figure 4. Coupling of EC Allocation and ST

EC allocation coupled with ST enables more realistic RA allocation while shedding light on potential capital shortfalls.

EC View (Illustrative)



Stress Tests (Illustrative)



*Stressed risk capital is an illustrative stressed estimate of EC over a 3 year forecasting period

Source: Accenture, January 2017

Moving Toward Closer Alignment with RA Allocation

Leading institutions are now focusing on integrating frameworks for RA allocation and capital management.

Essentially, RA defines how much risk an institution is willing to take while balancing the interests of various stakeholders. These include creditors and regulators, who are concerned with the potential impact of extreme downside events, as well as shareholders, who are concerned with earnings or share price volatility.

Reconciling top-down RA targets and bottom-up risk limits has been a key challenge for the industry over the years, but more and more institutions are enhancing their data integration and analytics capabilities to monitor and manage the impact of limits at the LOB or portfolio level on EW RA. The integrated nature of CCAR and ST processes and data flows is likely to make such reconciliation easier going forward.

There are a number of prevalent measures of RA, including solvency risk (which includes EC or CCAR stressed capital); concentration RA (exposures to sectors, counterparties and geographies as well as profits earned from specific sectors and regions); and volatility RA (reflecting earnings, economic profit, dividends and provisions for losses and other events). In the case of solvency measures, the available capital level and composition becomes the defining factor (such as Tier 1 Capital/EC, Tier 1 Capital/RWA, Common Equity Tier 1 (CET1) Capital/ RWA and the leverage ratio under stress scenarios). Finally, qualitative statements regarding non-financial risks (such as policy breaches or the number of risk incidents) should be used to inform overall tolerance levels.

The Four Pillars of an Integrated Framework

As seen in Figure 5 below, key components of an integrated framework include continuous alignment and rebalancing of balance sheet, risk and capital decisions in four key areas.

Figure 5. Key Components of an Integrated ST Framework

Source: Accenture, January 2017

Benefits of a CCAR and Capital Framework and the Intersection of C-Suite Functional Regimes

In an integrated framework, key components of strategic planning, RA, balance sheet management, risk management and capital management are dynamically refined to support and inform balance sheet, risk and capital decisions.

Figure 6. Integrated ST Framework

This integrated framework involves extensive cross-functional collaboration across the C-suite and centered around common KPIs.

Source: Accenture, January 2017

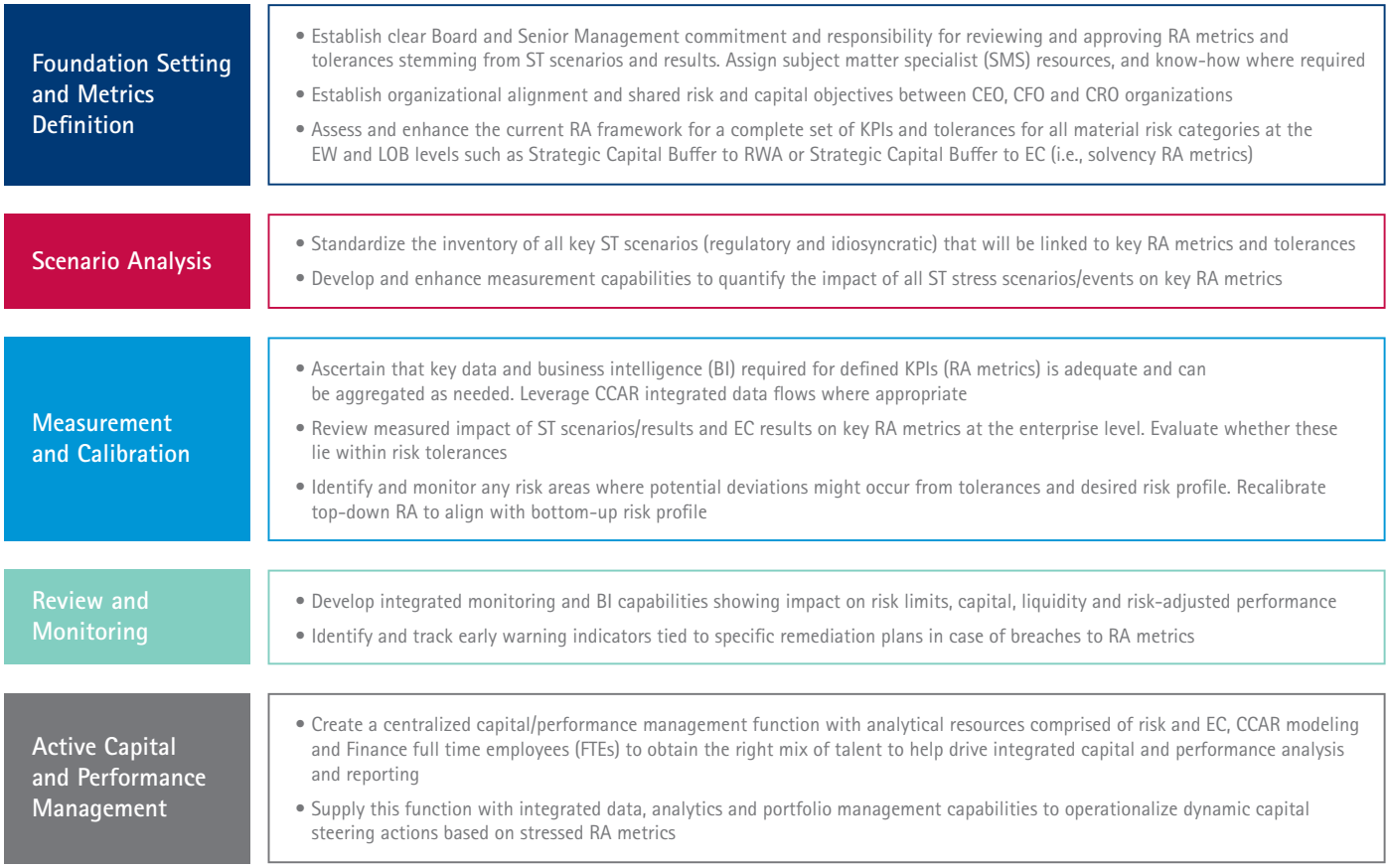
However, this integrated framework requires extensive collaboration among key corporate functions, particularly strategy (usually the province of the CEO); capital management (the CFO's domain) and risk management (the responsibility of the CRO). In order to accomplish this, the organization should align its decision processes, agree upon KPIs and use common metrics, analytics and reporting standards. We depict this intersection at the C-suite level in Figure 6.

Historically, each C-level office had a different stance on optimal trade-offs among strategy, capital and risk. However, the convergence across the three offices is spurred on by an unprecedented regulatory and market urgency to align strategy, capital and risk objectives. In recent years we have observed that the office of the CRO has become the "trusted business partner" with a much higher visibility in shaping the strategic direction and RA of the institution and working in much closer proximity with the CEO and CFO offices. A common set of KPIs that facilitate unified objectives across the C-suite is key and should be based on RA measures. Key enablers in this convergence include organizational alignment; RA allocation granularity and dynamic recalibration capabilities; aligned decision processes, shared KPIs; as well as integrated metrics, analytics and reporting.

Elements of an Integrated ST Framework

Financial institutions are encouraged to establish key milestones and capabilities to help embed CCAR scenarios and results into the RA framework and capital management processes.

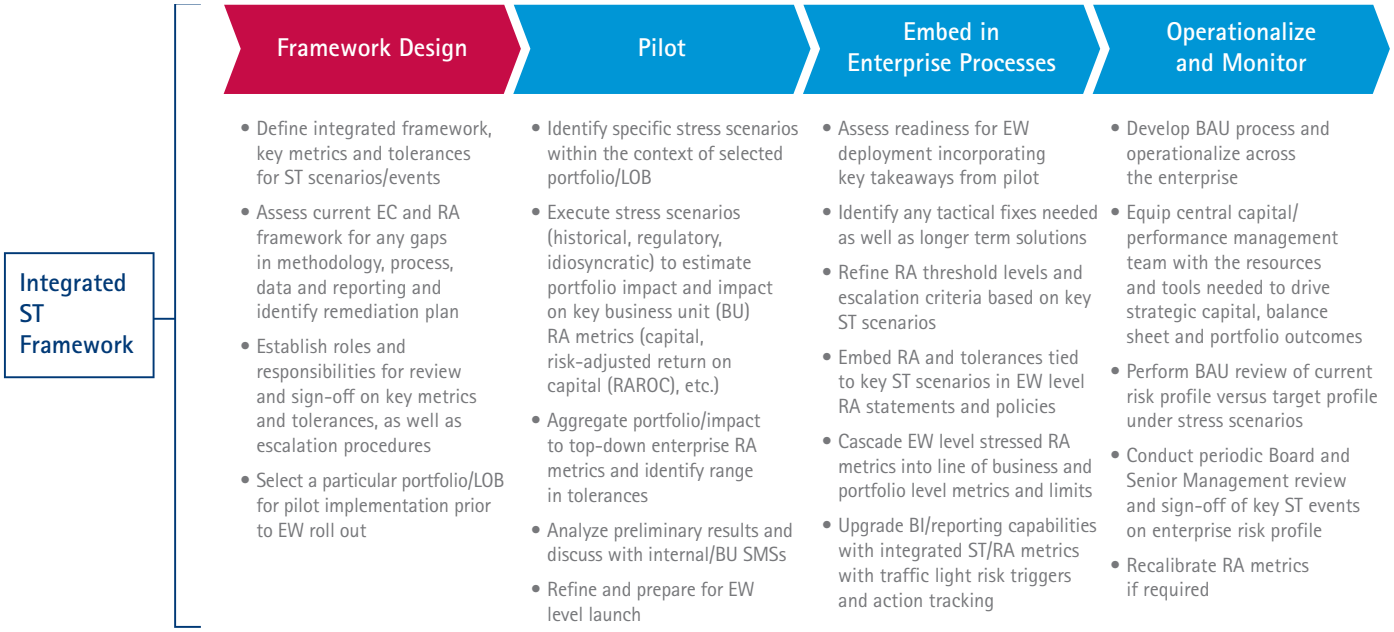
Figure 7. Building Blocks of an Integrated ST Framework



Source: Accenture, January 2017

Figure 8 presents the stages and component elements of an illustrative integrated testing implementation framework.

Figure 8. High-level Implementation of Integrated ST Framework



Source: Accenture, January 2017

Despite earlier divergence, CCAR and EC can make a powerful combination for integrated risk and capital management going forward (see Figure 9).

Figure 9. Overview of CCAR Stressed Capital vs. EC

	EC
Description	• Total capital required to safeguard the enterprise against economic insolvency based on economic risks undertaken over the specified time period
Operating Model	• Oversight, modeling and management of EC allocation is typically centralized at the enterprise level within Risk or EW level risk analytics • LOBs, Risk, Finance, Treasury serve as input providers for parameterization and modeling purposes
Risks and Methodology	• EC results reveal the economic risks of the institution • Typically encompasses credit, market and operational risk categories with sub-risks included in respective categories (e.g., counterparty risk in credit risk, ALM risk in market risk) • Mostly top-down capital allocation based on BU/portfolio-level estimates (e.g., probability of default (PD), loss given default (LGD) and exposure at default (EAD) and portfolio-level default correlations in the case of credit risk; factor sensitivities and correlations in the case of market risk; or parameters of frequency/severity distributions and dependency structures in the case of operational risk) • More granular allocations require simulation-based approaches with borrower, factor or loss type-level correlations mainly applied to selective portfolios/transactions (e.g., large corporates in credit, equities in market) • Calculated over a one-year time period
Enterprise Applications	• Regulatory communication of risk profile • Capital planning/management • Transaction structuring, pricing and limit setting • Portfolio enhancement and risk-adjusted performance decisions

Source: Accenture, January 2017

CCAR Stressed Capital	Key Differences
• Total capital required to safeguard the enterprise against regulatory insolvency under a set of stress scenarios over the specified forecasting period	• EC is designed to reflect real economic risks facing the firm in terms of unexpected movements in the value of assets and liabilities and on the confidence level selected by management • CCAR stressed capital forecasts are based on defined stress conditions designed to result in a more comprehensive assessment of capital under such conditions, which trigger regulatory action when thresholds are breached • Under the CCAR framework, portfolio, LOB and enterprise-level balances/cash flows are forecasted based on the risk strategy of the institution under stress conditions whereas EC excludes such forecasts
• Oversight and modeling of CCAR stressed capital displays a more hybrid operating model with individual LOBs developing models but aggregated results are managed and communicated jointly by CFO and CRO offices • LOBs, Risk, Finance and Treasury have responsibilities around modeling and forecasting of specific CCAR components (e.g., balances, expenses, losses)	• EC attribution takes place under a more centralized operating model as the methodology and forecasting requirements do not necessitate the active involvement of different constituents across the enterprise • In contrast, CCAR framework requirements are focused around provision and consolidation of end-to-end data, methodological and forecasting components from all LOBs and relevant functional units across the enterprise • While institutions target more centralization of CCAR frameworks, most institutions are in the early to mid stages of that process
• Capital impact of specific stress scenarios/events is modeled by stressing the balance sheet volumes and key risk parameters • Most CCAR banks developed/refined specific modeling approaches to forecast CCAR capital or adapted existing approaches (e.g., conditioned an internal ratings-based credit risk parameter model on macroeconomic variables) • Forecasting of risk-weights under the Basel III regulatory framework though there are differences in RWA calculation methods across institutions • Portfolio/LOB balances, revenues, losses and RWAs are modeled via numerous pre-provision net revenue (PPNR) and risk models across the forecasting horizon by LOBs and aggregated across the enterprise • Capital adequacy based on regulatory minimum thresholds for CET1, Tier 1 and total regulatory capital levels relative to RWAs • Calculated over a nine-quarter forecasting time period	EC: • EC results do not provide insights into the consequences of specific stress scenarios/events • "Tail" risks are still difficult to model due to limited data around extreme stress events; however, additional data accumulated during the recent crisis can shed some light in ongoing modeling efforts • Requires use of a capital multiplier based on selected confidence level for calculation • Most institutions use a hybrid of point-in-time and through-the-cycle risk parameters to compute EC, which is calculated over one year, invariably causing dilution in results CCAR STRESSED CAPITAL: • CCAR methodologies require a longer horizon with nine-quarter forecasting of cash flows and risk drivers • The CCAR capital framework is designed to estimate financial and capital impact (revenues, losses, RWAs) of specific regulatory and idiosyncratic scenarios with respect to each financial institution
• Regulatory compliance • Scenario analysis • Reserving	• EC planning and use for risk management is more established across the industry. Allocation granularity and risk and capital management applications vary significantly across institutions • CCAR capital planning mainly focuses on meeting regulatory requirements with limited use in other enterprise areas • Elevated expectations for CCAR integration into BAU decisions create new opportunities for reconciliation with EC processes

Conclusion

The intense focus on CCAR framework requirements in the post-crisis era has overshadowed the importance of sound EC management practices and past achievements.

Nonetheless, institutions can benefit from the convergence of these two areas. For example, scenario-driven forecasts of CCAR stressed capital can complement scenario-agnostic EC estimates in shaping the true RA of an institution as seen by regulators, creditors and shareholders.

Reconciliation between EC allocations, CCAR results and RA targets can serve as both bases and catalysts for an integrated risk and capital management framework going forward. We envision that, from an organizational perspective, EC teamed with risk management can serve as the final consolidation point in the CCAR lifecycle, providing review and oversight of CCAR results, while highlighting and bridging the differences with EC allocation and results.

To accomplish this, the offices of the CEO, the CFO and the CRO should make a concentrated effort to collaborate in instituting an integrated framework, accounting for the strengths and limitations of previously separate and stand-alone capital planning approaches, loosely connected with the RA of the institution and leveraging the cumulative benefit of the heavy CCAR investments made over the years. Despite the divergent paths they have taken in the past, CCAR and EC can combine to realize significant improvements in risk and capital management going forward.


CCAR
FRAMEWORK

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