

WHITE PAPER
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Building an Enterprise-wide Risk Appetite Framework

Highlights

Under Basel III, financial institutions are subject to additional liquidity, capital, and equity costs that will affect their investing and lending activities and returns for shareholders and investors. As a consequence, defining and analyzing the risk appetite statement has become a fundamental tool to maintain acceptable returns while exploiting potential competitive advantages linked to institutions' business models and portfolio compositions. This paper reviews these challenges and analyzes how an institution should address them when defining their risk appetite statement and strategic goals. The Strategy Resilience Analysis (S.R.A.) concept is also introduced, along with how to use it to understand the balance sheet resilience, identify vulnerabilities in the risk appetite statement, and reduce financial metrics' volatility. Finally, the advantages of having an enterprise-wide platform for data consolidation, analyzing, reporting, and managing risk appetite are discussed as well.

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The Risk Appetite Function at Financial Institutions

Risk Appetite defines the amount of risk a financial organization is willing to take to achieve an expected goal. In finance, risk is the probability that an investment's actual return will be different from expectations. Therefore, risk appetite is defined by a financial institution's sensitivity to adverse outcomes.

Risk appetite is a core metric when defining an institution's balance sheet composition and for on-going strategic decision making. Moreover, a financial institution's performance indicators depend on their risk appetite statement and balance sheet strategy since the risk appetite statement determines profitability. Therefore, balance sheet and portfolio sensitivity analysis is critical in defining risk appetite.

Although risk appetite is a critical component of a financial institution (for example, for ICAAP or capital planning purposes), it is not usually well implemented or understood by financial institutions given the difficulty they have in providing an integrated, realistic enterprise-wide view across scenarios, portfolios and metrics.

From a regulatory perspective, the regulators are also aware of the current weaknesses of risk appetite frameworks, their lack of practical application, and the need for further investment on enterprise risk management infrastructure and data aggregation. For example¹:

- "... risk appetite is not well understood in many firms to a level of clarity that provides a reference point for all material decision making. There is a big step between defining and applying risk appetite ..."
- "... while firms have made progress in developing risk appetite frameworks and have begun multi-year projects to improve IT infrastructure, considerably more work must be done to strengthen these practices. In particular, the aggregation of risk data remains a challenge, despite its importance to strategic planning, decision making and risk management..."
- "...data should be forward looking to provide early warnings of any potential breaches of risk limits that may be against the bank's risk appetite..."

From a practical perspective, the risk appetite sensitivity analysis is a strategic profitability and risk management decision making tool. Setting an appropriate risk appetite framework can negatively affect the overall business strategy, improve profitability, make the balance sheet more resilient and allow senior management to be prepared to respond to adverse scenarios.

Figure 1 shows the major indicators affected (1) risk, efficiency and performance metrics; (2) balance sheet profitability indicators; and (3) capital and liquidity measures.

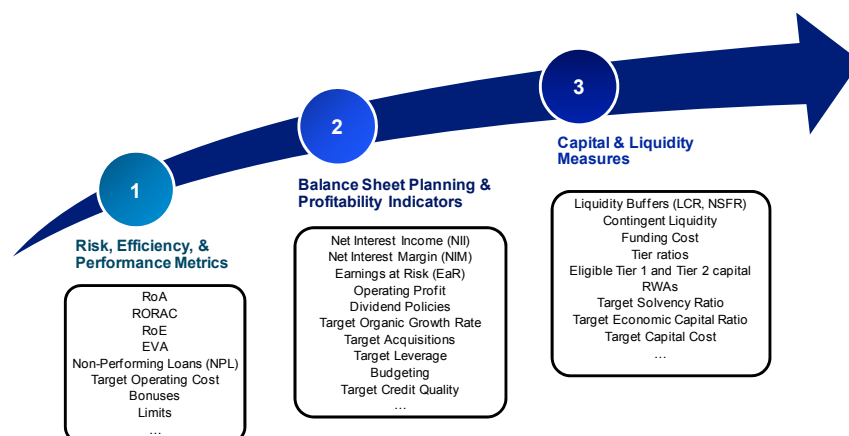


Figure 1: The risk appetite statement affects financial institutions' performance indicators

¹ Financial Services Authority (FSA), Federal Reserve of New York, and Basel Committee respectively.

Although the effects may be not noticeable in the short term, a problematic risk appetite statement can render an institution's business model unviable in the medium and long term². An institution's senior management has to analyze the sensitivity of the balance sheet during the strategic planning phase in order to identify vulnerabilities and opportunities.

An effective risk appetite statement is built through an integrated framework that includes both quantitative and qualitative inputs. In detail:

- Infrastructure and Data: An enterprise risk management infrastructure facilitates the aggregation of data, metrics and reporting across business lines, regions, and regulatory jurisdictions. An effective enterprise risk management infrastructure provides a unique, single platform to analyze and report the risk holistically at the enterprise level after consideration of strategic initiatives, regulatory requirements, scenarios or business planning.³
- Quantitative Analytics: Defining risk appetite is portfolio and business specific; therefore, a quantitative set of tools is needed to analyze and quantify capital, liquidity, and concentration risks on the portfolio. These main solutions are the basis for this analysis:
 - Concentration Risk Analytics: Measuring concentration risks is core to set risk limits properly and avoid misleading indicators like exposure-at-default.⁴
 - Risk Limits Analytics: In order to allocate the capital resources based on concentration risk metrics for an institution's portfolios.
 - Enterprise-wide Stress Testing Analytics: Stress testing is core to project the performance of the strategy, perform sensitivity analysis of the financial metrics for a given risk appetite statement, and identify vulnerabilities under different scenarios, regulatory requirements, and business strategies. Interdependencies between capital-liquidity-funding should be tested as well. Figure 2 provides an overview of the desired capabilities for an enterprise-wide stress testing solution.



Figure 2: Core capabilities for an enterprise-wide stress testing solution

- Reverse Stress Testing Framework: Tool to analyze tail risk and identify hidden vulnerabilities that may render the business model ineffective or unprofitable.⁵
- Liquidity and ALM Analytics: Tools to project cash flows and analyze the liquidity and funding position of the financial institutions' balance sheet.
- Qualitative Framework: The institutions should have a set of policies and governance documents to support better enterprise risk appetite decisions for strategic planning purposes by addressing the core risk appetite questions. In detail:
 - Enterprise Risk Appetite Framework: The institutions should have an integrated, enterprise risk appetite framework that entails centralized monitoring of core performance metrics (profitability, liquidity, funding, credit risk and efficiency).
 - Risk Appetite and Strategic Planning Policies, and Contingency Plan: Recommendations for risk appetite definition, allocation, management and monitoring. The vulnerabilities in the business model and risk appetite

² For example, the brokerage firm MF Global filed for bankruptcy as a consequence of the losses generated by their appetite statement and risk limits definition for some portfolio segments.

³ Moody's Analytics ScenarioAnalyzer™ platform provides a consolidate platform for on-going risk appetite definition, balance sheet forecasting, stress testing analysis and strategic planning.

⁴ "Enhancing financial institutions' risk limits framework", Moody's Analytics ERS white paper. Cayetano Gea-Carrasco, June 2012.

⁵ "Understanding tail risk: reverse stress testing", Moody's Analytics ERS white paper. Cayetano Gea-Carrasco and Mikael Nyberg, October 2012.

- statement detected during the sensitivity analysis and stress testing should be addressed in this set of documents as well.
- Risk Appetite Execution Plan: Execution plan to implement an enterprise risk appetite framework.
 - Governance Framework for On-Going Maintenance: Governance structure to be used for on-going operations regarding balance sheet management strategic planning, risk appetite definition, contingency planning and coordinating the perspectives of the CRO, CFO, CEO and treasurer.

Finally, institutions should have a roadmap to help plan risk appetite needs by understanding regulatory, infrastructure and institution-specific requirements. Figure 3 summarizes the major building blocks and dependencies of an enterprise risk appetite framework:

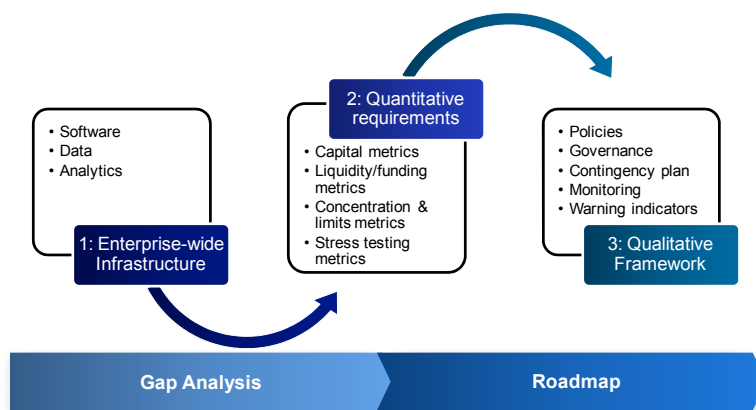


Figure 3: Building blocks for an enterprise-wide risk appetite framework

Basel III Brings Additional Liquidity, Capital, and Equity Costs to Financial Institutions

An effective risk appetite strategy is a game changer for financial institutions. Under Basel III, financial institutions' capital, liquidity, and equity cost have become elevated for some portfolio segments and asset classes. For example, the risk weighted asset (RWA) consumption can double for some assets compared with Basel II; therefore, the effect on the financial performance of investing and lending activities as well as efficiency metrics can be very severe. As a consequence, balance sheet strategic planning and risk appetite definition have become key to delivering acceptable returns commensurate with risks.

Institutions have moved from a "wait and hold" approach to a strategic redefinition of their risk appetite given the existing macroeconomic and regulatory uncertainties. For example, from 2007 on, many institutions around the world have started a strategic redefinition of their risk appetite and balance sheet, planning to address the regulatory requirements.

In detail, the balance sheet composition of many financial institutions has been tracking regulatory requirements. Capital conservation, targeted growth and smaller balance sheets have become the main priority across regions and institutions.

Figure 4 reflects these balance sheet behavioral trends from 2007 to date: under Basel III, the smaller the balance sheet the better. In order to achieve target profitability and efficiency goals, institutions are reducing the maturities of the portfolios, performing RWAs re-engineering and optimization, cutting their exposure to capital and liquidity-intensive business lines and deals,⁶ and reducing positions in illiquid assets.⁷

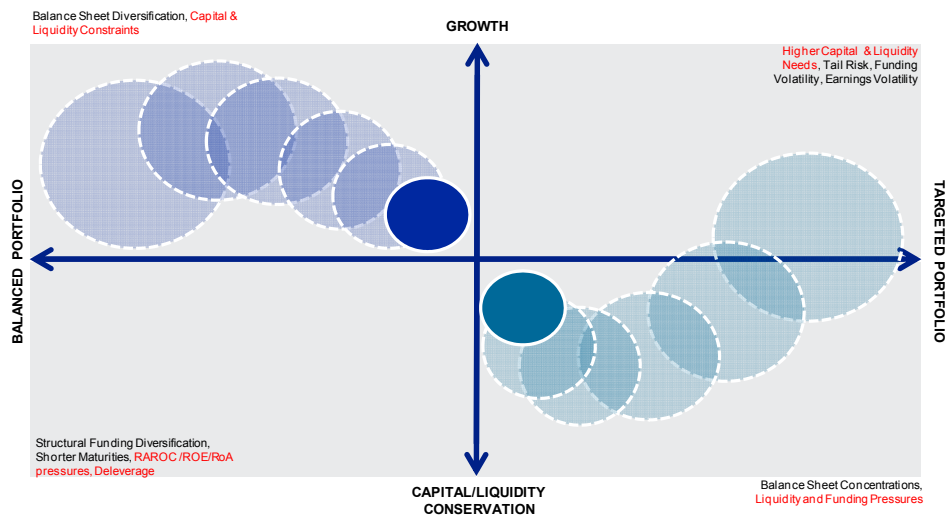


Figure 4: Basel III requirements are a constraint for financial institutions. Under Basel III, the smaller the balance sheet the better

Financial institutions' balance sheet metrics reflect the performance of an institution's risk appetite strategy. Figure 5 shows the effects in terms of Return-on-Assets (RoA). For example, Asia-Pacific financial institutions proved to be the most resilient amid the crisis. They have, on average, a more balanced risk appetite and a lower leverage ratio than their European and US peers, which help them to consistently deliver higher RoAs during the financial crisis.

Regarding European and US financial institutions, RoAs suffered a sharp decline in 2007 which has continued due to poor balance sheet performance, higher regulatory capital and liquidity costs,⁸ deleveraging effects, and the sovereign crisis in Europe. RoA at US institutions however, is starting to increase versus European peers, although the levels are still substantially below historical averages.

⁶ Long-term businesses may suffer a substantial increase in their capital and funding costs. For example, project finance or commercial real estate loans.

⁷ Some central banks are pushing banking regulators to relax the LCR asset requirements by including or changing the classification of asset-backed securities, covered bonds, and loans to businesses in the calculation. This would increase the liquidity of those assets, most of which are illiquid at this stage.

⁸ "Adapting financial institutions' liquidity risk management framework to the new regulatory environment". Moody's Analytics ERS white paper, Cayetano Gea-Carrasco, July 2012.

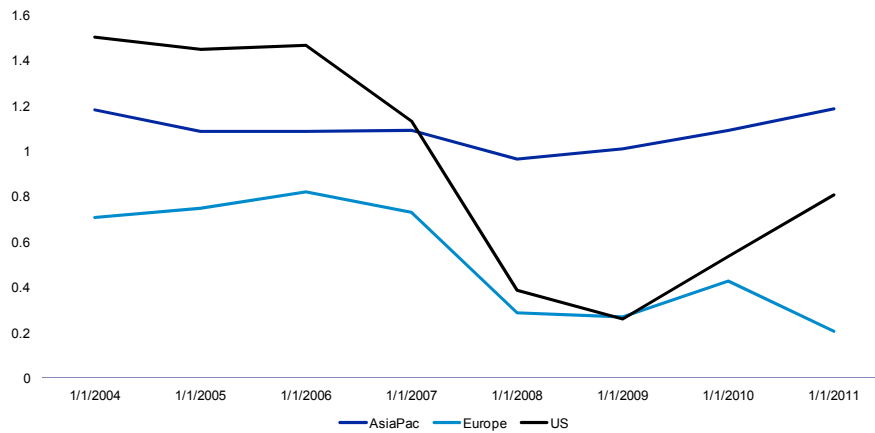


Figure 5: Average quarterly RoA for Financial Institutions (%)

Finally, non-performing loan (NPL) dynamics also reflect how well an institution's risk appetite framework performed in the medium and long term. For example, although the Asia-Pacific region's NPL levels are below 2% – driven by the upper economic cycle and buoyant economy in the region – the risk appetite statement should be analyzed and monitored proactively to avoid a spike in losses when the cycle changes in the region. Figure 6 illustrates those trends.

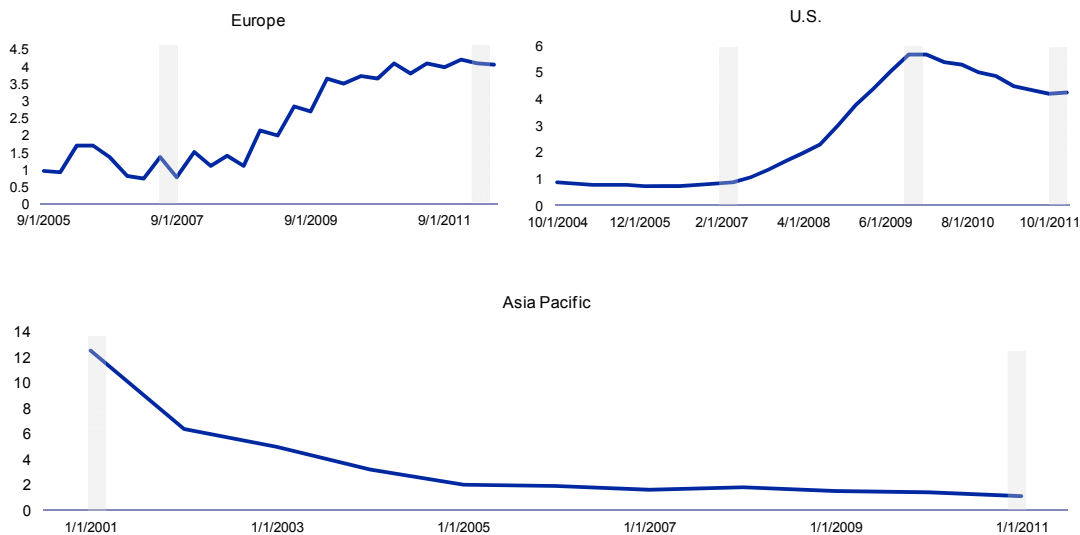


Figure 6: Average NPL series by region (%). Grey areas show the dates with the NPL minimum and maximum values

In contrast, European and US NPL ratios are still above historical averages, reflecting the excessive risk taken on the real estate sector, as well as the deterioration of their credit portfolios due to their risk appetite statement. A sensitivity analysis of their balance sheet would have reduced these effects and helped these institutions to take actions and prepare a response before changes hit.

Defining An Institution's Risk Appetite Statement

From a practical perspective, we propose to define an institution's risk appetite in terms of how sensitive financial goals are for a given strategy. In order to explore the risk appetite implications of these goals, balance sheet sensitivity must be assessed under different scenarios.

This balance sheet analysis allows financial institutions to forecast the behavior of their balance sheet by analyzing revenues, capital, funding, solvency ratios, operating costs, dividend policies and liquidity buffers. At this stage, institutions should compare the adequacy of those forecast with the board's strategy and quantify deviations by performing a sensitivity analysis under different scenarios. This analysis helps to understand how resilient the balance sheet is, thus identifying potential vulnerabilities. Figure 7 provides an example.⁹

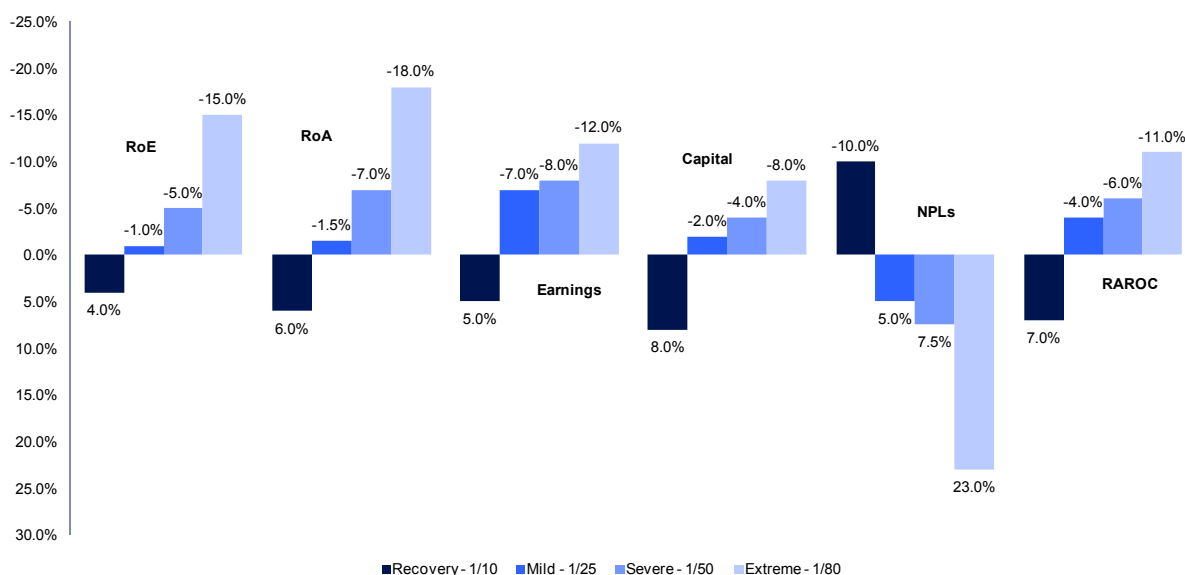


Figure 7: Enterprise-wide risk appetite sensitivity analysis, deviation from target values (% annual forecast), under four macro economic scenarios

Institutions should leverage the results of the sensitivity analysis in order to ensure that the financial, budget and risk management targets are met given their risk appetite strategy by taking mitigating actions such as hedging, equity issuance, provisioning, assets securitization, asset transfers for intra-group capital and/or liquidity buffers planning.

Finally, an enterprise risk appetite governance framework articulates the structure to be used for on-going operations regarding balance sheet management and strategic planning, risk appetite definition and execution, and coordinates the perspectives of the CRO, CFO, CEO and treasurer.

⁹ Analysis performed using Moody's Analytics ScenarioAnalyzer™ and RiskFrontier™ credit portfolio model. For illustrative purposes only.

Strategy Resilience Analysis (S.R.A.)

The Strategy Resilience Analysis (S.R.A.) facilitates testing the sensitivity of the balance sheet under different macroeconomic scenarios and stress testing conditions. The S.R.A. helps financial institutions to understand how resilient the balance sheet is under different scenarios and identify vulnerabilities in their risk appetite statement.

The S.R.A. links an institutions' financial performance metrics, risk appetite statement, and stress testing. In detail, the S.R.A. forecasts the balance sheet's future performance in order to quantify the strategic impacts of the risk appetite statement. The S.R.A. helps institutions to reduce future financial metrics' volatility, equity, funding, and capital costs; therefore, the institutions' senior management can consider those critical effects when defining the institutions enterprise-wide risk appetite according to their strategic goals for the future and/or regulatory-driven requirements.

Among the major balance sheet metrics of interest for S.R.A. purposes are those related to liquidity, capital and equity costs under different business models and across scenarios. The S.R.A. finalizes answering core questions like:

- What impact will an adverse scenario have on your efficiency ratios?
- How much sensitivity are you willing to take in your financial metrics?
- What risk appetite level is the most adequate to achieve a target profitability level?
- How resilient is the balance sheet under different scenarios and stress testing conditions?
- Which vulnerabilities am I likely to face – and what are the effects on tail risk?
- ...

Figure 8 illustrates an example of the S.R.A.¹⁰ In this particular case, an institution's return-on-equity (RoE) is forecasted on a quarterly basis under a set of macroeconomic scenarios and stress testing conditions for a given risk appetite strategy driven by Basel III regulatory requirements. Finally, the S.R.A. presented in this example also quantifies the risk appetite effects on the institution's operating profit that is used to trigger an indicator when the forecasted value is below analysts' expectations or senior management target goals.

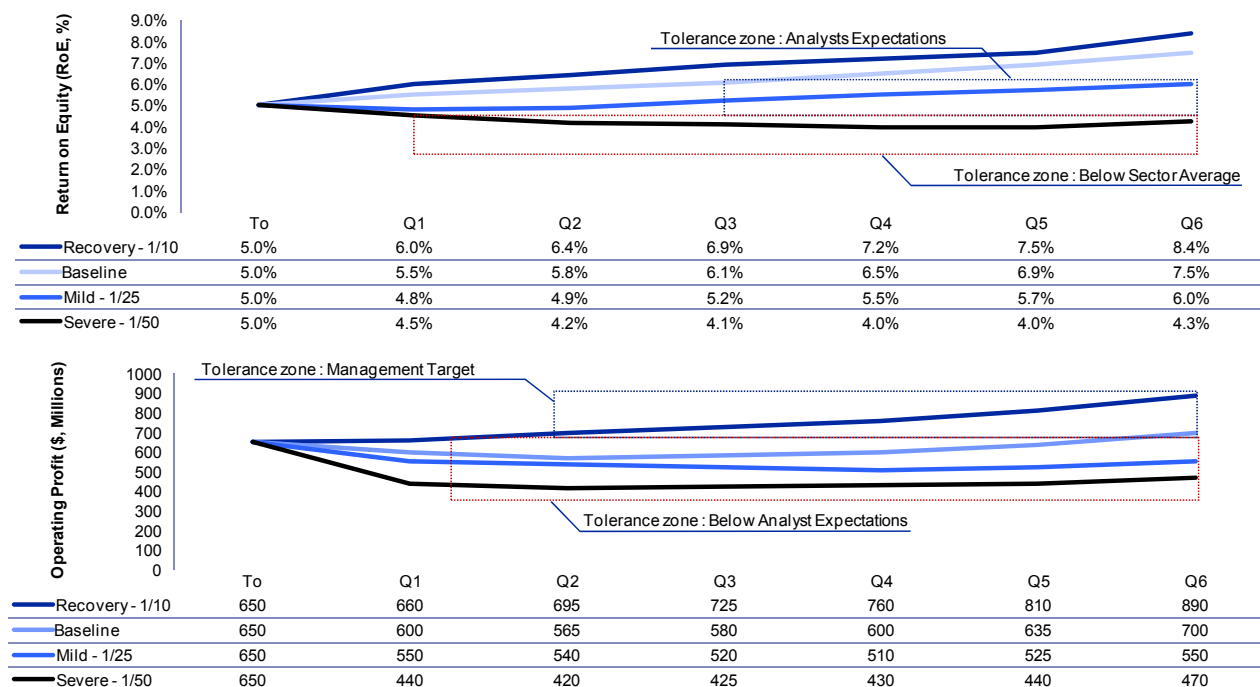


Figure 8: S.R.A. is performed by forecasting RoE and Operating Profit under four macro scenarios (quarterly basis)

¹⁰ Analysis performed using Moody's Analytics ScenarioAnalyzer™ and RiskFrontier™. For illustrative purposes only.

Toward an Enterprise-wide Risk Appetite Framework

Having an enterprise-wide risk management framework to manage the risk appetite is a game changer for financial institutions. In order to be successful, three major building blocks are necessary: infrastructure, analytics and policies. These blocks help to improve profitability versus peers, prepare better business and strategic plans, reduce regulatory costs, and meet financial and efficiency targets while limiting risk.

This infrastructure helps to integrate scenarios, data, reporting, stress testing models, and maintain the metrics' history for trend analysis, auditing, and benchmarking. All information critical to calculating, managing, reporting and monitoring the performance of the portfolios under different risk appetite strategies should be easily and cost-effectively available.

The forecasting capabilities of an enterprise solution facilitate the quantitative testing of the performance of the risk appetite statement and the optimal allocation of capital by scenarios, geographies, asset classes or business lines as well.

The analytics should quantify the impact of the strategy and the risk appetite statement on the financial institution's core metrics. S.R.A. would identify hidden vulnerabilities of the risk appetite statement and help planning in advance before changes hit. At this stage, holistic quantification of the core financial metrics' sensitivity under different stress scenarios, growth strategies, and regulatory effects must be performed as well. A silo-based risk sensitivity analysis should be avoided.

A set of policies should execute the risk appetite statement, define the governance structure and be used for on-going operations regarding balance sheet management, strategic planning, risk appetite redefinition, and coordinating the perspectives of different divisions at the institution (e.g., Treasury, Risk Management, Liquidity and ALM, board of directors,...etc).

Finally, the correspondent contingency plans should be aligned with the institutions' financial metrics sensitivity for a given risk appetite statement and overall business strategy. This would make the business model and balance sheet more resilient, and allow senior management to be prepared to respond to adverse scenarios that may affect the institution risk appetite statement before changes hit as well as future regulatory requests.

About Us

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This whitepaper presents Moody's Analytics insights on Enterprise Risk Management Solutions based on our experience with clients around the world, research, and expertise. It is part of a broader series of documents aimed to share good practices and expertise among practitioners.

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