Moody's Analytics: Stress Testing and Capital Planning

Objectives

Primary: Leave the participants with a few key thoughts around stress-testing and capital planning, seeking to shift the exercise from a mere compliance mandate to an opportunity to revitalize internal processes to create a more flexible, resilient, and proactive financial institution where risk information and decisioning can be integrated, not silo'd.

1. Polling questions
2. What is the stress-testing requirement, operationally?
3. Moody's Analytics Perspective and Key Takeaway Themes

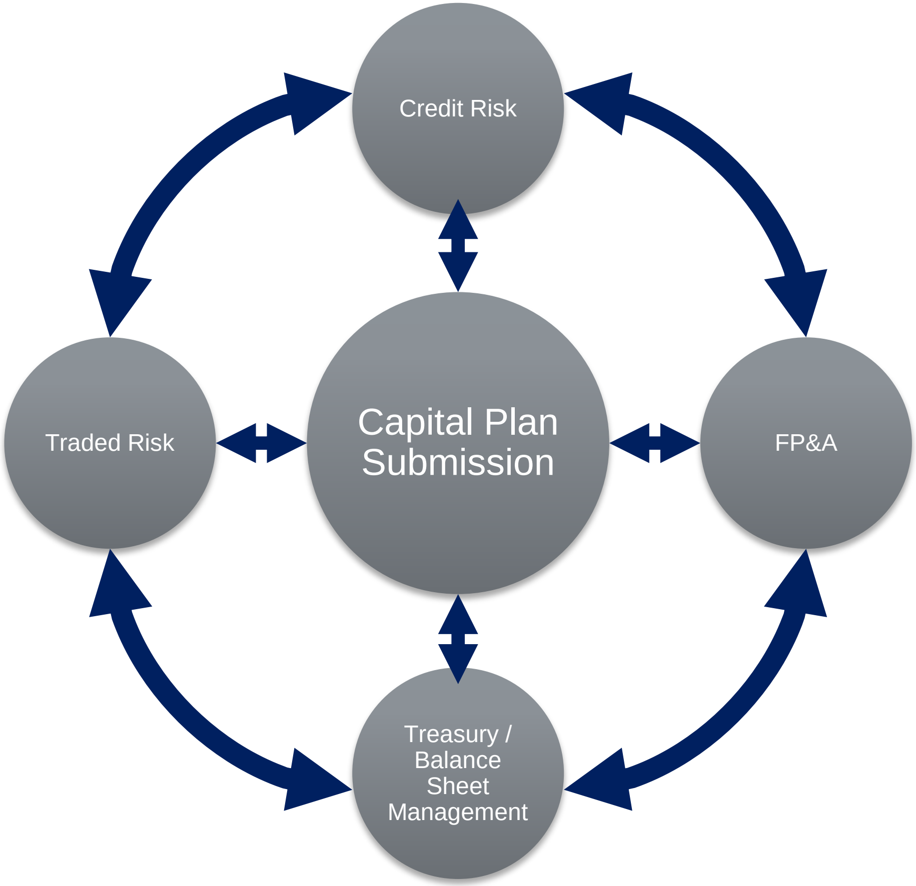
Polling Questions: Two groups – Bankers | Regulators

1. Is stress-testing and capital planning here to stay?
2. Do you consider integrated stress-testing an exercise of strategic internal importance, without regard to the regulatory requirement?
3. If you conducted a CCAR/DFAST stress-test and capital plan, raise your hand. Keep it up if you think the current process (internally and externally) is sustainable. (note: define sustainable)
4. There is a need for more detailed guidance around expectations (e.g., the bank should ideally be capable of performing a stress-test at a "monthly/quarterly/annual" operational tempo; must be consistent with the budget/plan, ALCO results, etc).
5. There is a need for significantly improved integration between credit, planning, treasury, capital calculations, and regulatory reporting.

Enterprise-wide Impact of CCAR Exercise

"One of our biggest challenges is coordinating amongst the different stakeholders in a way that is transparent, controlled, auditable, dynamic, and repeatable. It requires Board and C-Suite level commitment."

Director at a G-SIFI CCAR Institution



Areas of CCAR Risk Quantification

- **Basel 3 / DFA / Regulatory Capital**
- **Pre-Provision Net Revenue (PPNR)**
  - Interest Income, Non-Interest Income
  - Interest Expense, Non-Interest Expense
- **Operational Risk**
- **Credit Risk**
  - Default, Recovery, and Loss and Loss "Timing" (accrual, not MTM)
  - Credit Related Accounting
  - Concentration(s)
  - Retail – International and Domestic
    - Auto
    - Card
    - Home Equity
    - Mortgage
    - SME
    - Student
    - Other Consumer
  - Wholesale – International and Domestic
    - C&I
    - CRE
    - ADC
  - ALLL
- **Securities**
- **Trading Book**
- **MSR**
- **MTM (non-trading; FVO; FAS 157/159)**

The New Regulatory Landscape: Requirements

- Unprecedented coordination between Risk, Credit, Finance, Treasury, and Planning Processes
- Efficiency of operations and integration across these functional areas
- Effectiveness of operations such that investments made support internal and external reporting, inclusive of capital planning and regulatory requirements
- Open design to include a variety of multiple, conceptually sound models, methods, and process management workflows
- Data-driven analysis with proper SME overlay
- Best of breed validation and process controls
- Multiple design choices depending on platforms and priorities.

Consequences of Failure

“I was being asked to attest to this. It is worse that SOX 404. I hired [CRO] to have him sign it. I’m not signing this thing.”

In a word:

SEVERE

Actions that can be taken for poor CCAR data, analytics, and processes:

1. Inability to pay dividends
2. Prohibition from buying back stock (treasury stock repurchase programs)
3. Leverage limitations
4. Capital and liquidity surcharges
5. Prohibition on growth – organic and M&A
6. Fines
7. Informal and formal actions (e.g., WA, MOU, C&D, Capital Directive)

Failure can originate from poor processes, governance weaknesses, analytical, infrastructure and reporting shortcomings. Most often (to date): data and infrastructure

Computational Complexities – Data, Modeling, Reporting

Year 1

Q1 Q2 Q3 Q4

Profit & Loss Forecast

+ Net Interest Income
+ Trading Revenues
+ Non Interest Income
-Non Interest Expense

+ Pre-Provision Net Revenues

- Charge-Offs
+ Recovery

Expected Net Charge-Offs (NCO)

-ALLL forecast

+/ - Net Revenues for non-banking activities (asset mgmt, insurance, etc.)

Taxes
Dividend Payout
+/- Accounting Adjustments
(effect of changing acct standards)

= Available Capital

Year 2 + 1Q

Q5 Q6 Q7 Q8 Q9

Profit & Loss Forecast

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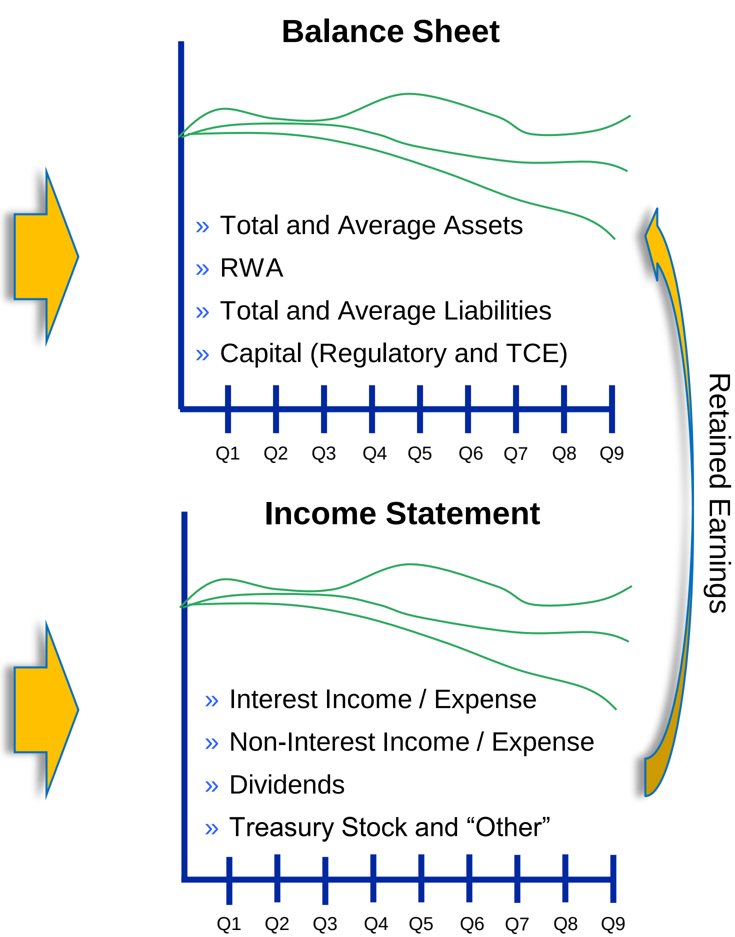
Macro/Regional Economic Scenarios
Business Plan (Basic/Advanced)



Current Industry Pain Points

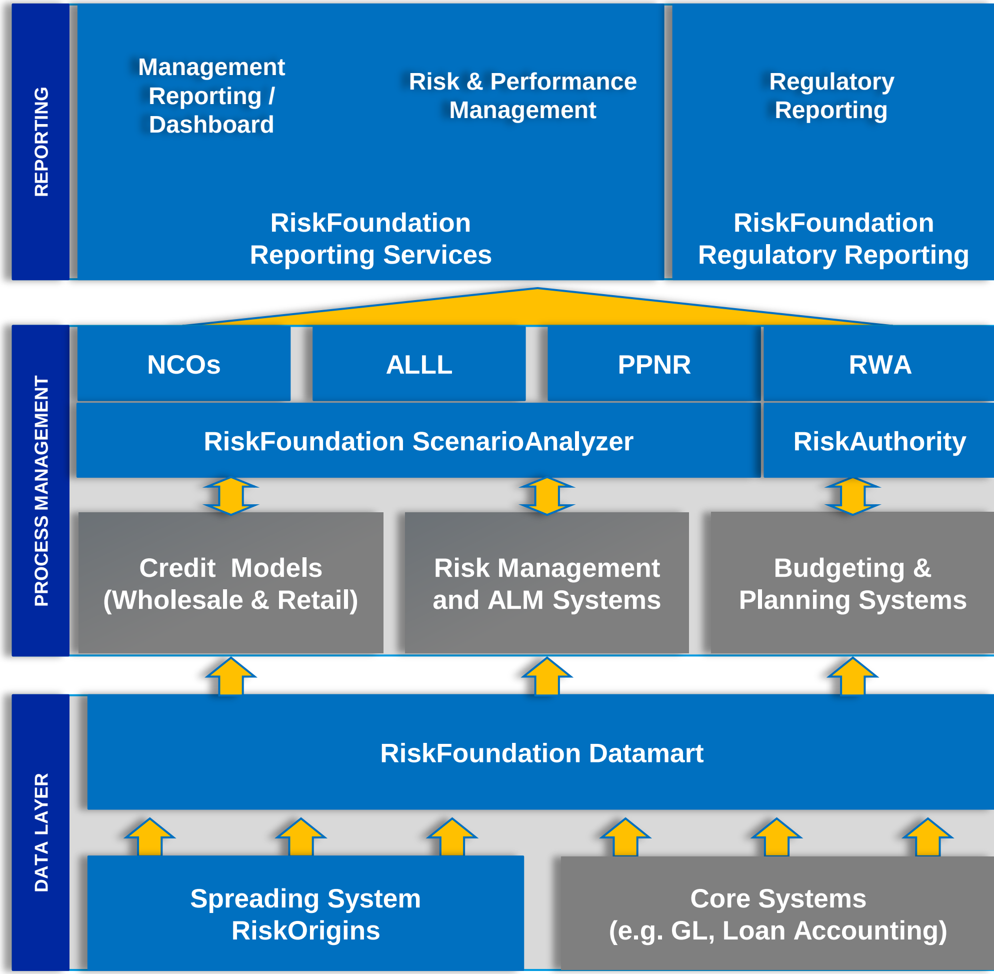
- Improving the Efficiency and Effectiveness of the Stress-Testing Process (governance)
- Regulatory and Management Reporting – US FRY14M-Q-A/15/Y9 et al
- Credit sensitive new business production conditioned on scenarios; integration with planning
- Infrastructure – Dynamic, pro-forma RWA, risk and finance data integration, reconciliation, validation, and lowering "spreadsheet" risk
- Validation and Transparency
- Idiosyncratic scenarios – beyond regulatory scenarios
- Data Modelling
- Asset modelling – sound practices: Retail, Wholesale, Funding
- Modelling Methodologies – Top Down and Bottom Up
- Default, loss and recovery timing
- Conditional Measures
- Managing Multiple Hierarchies and Workflow/Dependencies

FALSE

"You don't really have to do anything different, and it won't be expensive or disruptive."

Moody's CCAR Solution: Areas of Focus

Modular, Flexible and Comprehensive – allowing for Straight Through Risk Processing



- Our solution design accommodates comprehensive regulatory reporting, internal risk and LOB reporting, plus dimension / hierarchy management:
  - Executive and board-level reporting
  - Instantiation of the organization's Risk Appetite Framework(s)
  - Existing and expected liquidity risk reporting
  - Drill-through and scenario dependent PPNR, balance sheet, new business volume
  - Comprehensive wholesale and retail credit portfolio reporting

RISK REPORTING

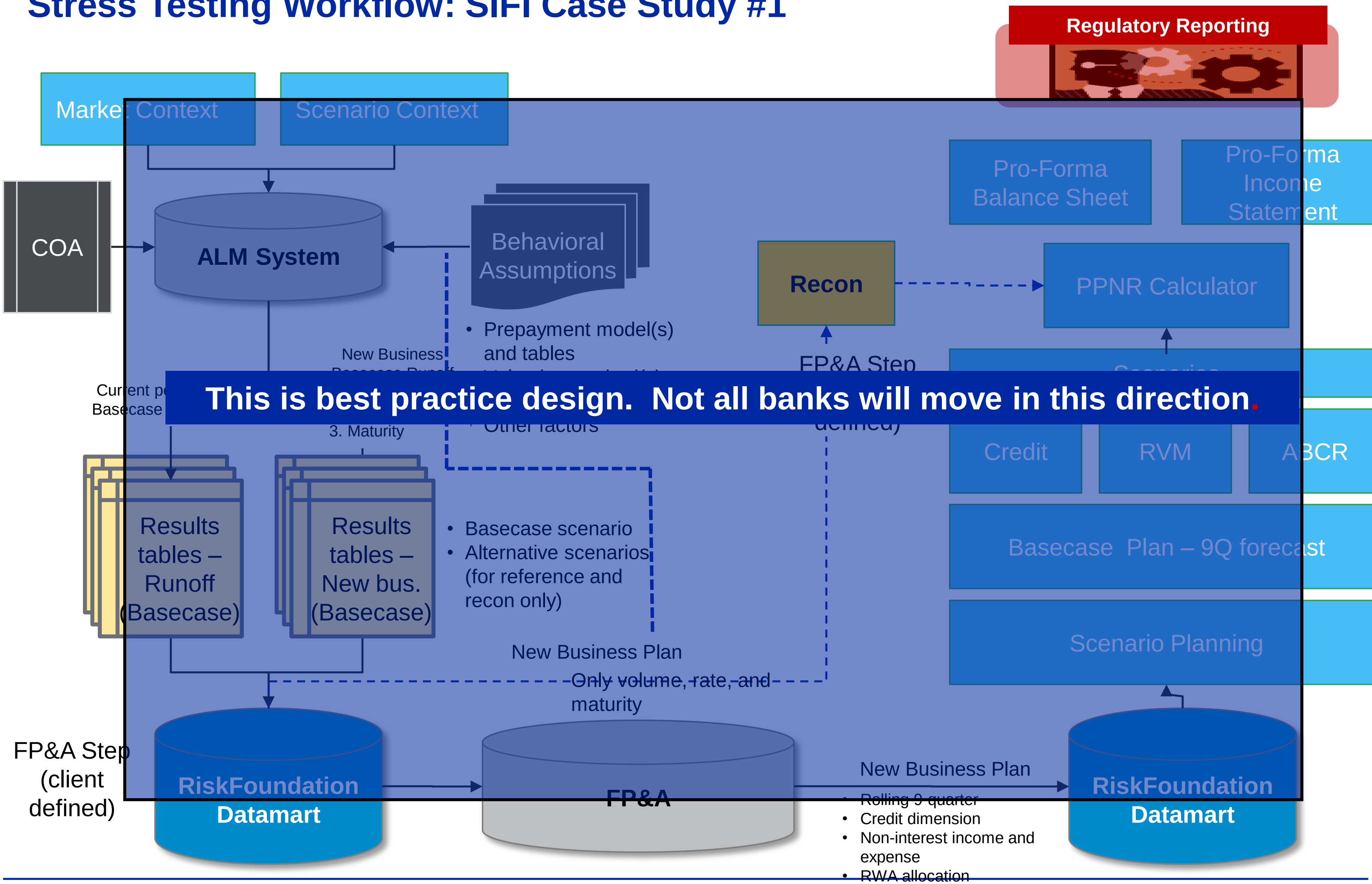
- Moody's is able to work within existing analytical layer to coordinate, enhance and improve risk transparency
- By linking results from point solutions to the reporting layer (RiskFoundation), Moody's can empower the bank by providing key linkage between input data and output results.

RECONCILIATION

- RiskFoundation Datamart as an integrated risk and finance data layer is the foundation for stress testing
- RiskFoundation can be integrated with various data sources, including enterprise data warehouses and core banking systems
- This platform layer is used for Dodd-Frank-mandated reporting (e.g. CCAR stress testing), Basel II and III

- Part of Moody's Solution
- Bank's Internal / Third Party Systems

Stress Testing Workflow: SIFI Case Study #1



This is best practice design. Not all banks will move in this direction.

Credit Loss Results – Differences: Average 198.8bps

		Averages	Min	Max
A	**INTERNAL MODELS**			
	Portfolio Loss	5.19%	4.10%	7.20%
	1REM	3.66%	2.10%	5.90%
	Junior Lien/HELOC	7.69%	2.80%	12.80%
	Commercial and Industrial	3.96%	2.90%	5.30%
	CRE	4.40%	2.20%	6.20%
	Credit Card	14.96%	9.50%	18.80%
	Other Consumer	5.84%	3.30%	13.20%
	Other Loans	2.24%	0.70%	4.50%
B	**FRB MODEL**			
	Portfolio Loss	7.08%	5.50%	9.20%
	1REM	6.65%	2.80%	10.30%
	Junior Lien/HELOC	9.08%	6.10%	13.40%
	Commercial and Industrial	6.89%	5.10%	9.50%
	CRE	8.18%	7.10%	11.30%
	Credit Card	16.84%	14.40%	19.10%
	Other Consumer	6.91%	3.50%	16.50%
	Other Loans	2.23%	1.30%	3.80%

C	BP Differences	188.75	140	200
	1REM	298.75	70	440
	Junior Lien/HELOC	138.75	330	60
	Commercial and Industrial	292.5	220	420
	CRE	377.5	490	510
	Credit Card	187.5	490	30
	Other Consumer	107.5	20	330
	Other Loans	-1.25	60	-70
	Average Difference (bps)	198.75		

There is a “group-think” pattern that has emerged as a result of the FRB being statutorily forced to disclose its model results.

The goal is not to mimic the FRB estimates, but to be able to defend internal loss estimates.

It is hard to see how this goal will be attained with the existing process, paucity of guidance, and “by committee” thinking that appears to be occurring.

Goal: Use FRB loss rates in the supervisory process only. There is no ‘real’ need to disclose FRB model results.

Key Takeaway Themes:

1. Done correctly, **stress-testing is merely a special case of on-going bank risk and financial planning operations**. There is a need to achieve a "normal course of business" standing, and we are a long way away from this given discordant and inconsistent feedback and guidance.

2. There must be an acknowledgement that **existing systems are ill-suited to handle the current expectations**. In April of 2010, former Comptroller Dugan made this point at the Richmond FRB. I don't think it was fully appreciated. Feedback to banks seems to stop short of driving the proper points home on needed integration points.

3. **Until we achieve a "closed-system" structure, banks will continue to see stress-tests as a chore and a compliance exercise**, not as a way to better manage their firm. If the goal of the FRB is to improve safety and soundness through data-driven analytical capabilities, changes to the current process should be considered, starting with more effective guidance driven, perhaps, from a horizontal review and report on best practices.

MOODY'S ANALYTICS

INDUSTRY INSIGHT

Summary of 2013 Comprehensive Capital Analysis and Review and Dodd Frank Act Stress Tests

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Summary of Dodd Frank Act Stress Tests

On March 7, 2013, the U.S. Federal Reserve System released the results of the 2013 Dodd-Frank Act Stress-Test (DFAST). As expected, the overall result of the exercise reflects improvement in the capital strength of the industry, with an aggregate tier-1 common equity of 11.1% versus a 10.1% level for the 2012 stress-test results.

In the 2012 stress-test results, four banks breached the 5% minimum tier-one common equity threshold while only one firm – Ally Financial – breached the minimum tier-one level in 2013. The post-stress capital levels also improved, with a 7.7% post-stress tier-one capital level compared to a 6.3% level in 2012 (see Table 1 below). Overall pre-provision net-revenue (PPNR) levels moved lower year-over-year, with a 2012 level of $294 billion versus a 2013 level of $268 billion. This lower level of earnings strength is attributed to lower market interest rates and narrower spreads, a reflection of the continued effort by the Federal Reserve to support broader economic growth through easing monetary policy.

Table 1: Summary: 2013 versus 2012 Stress-Testing Results

	2012	2013
Aggregate Projected Loss	($534)	($462)
Aggregate PPNR	$294	$268
Other Revenue	$2	$1
Provisions	($324)	($317)
Securities Losses	($31)	($13)
Trading and C/P Losses	($116)	($97)
Other Losses	($45)	($36)
Aggregate Pre-Tax Net Income	($220)	($194)
Threshold Breaches	4	1
Tier-1 (beginning)	10.1%	11.1%
Tier-1 (ending)	6.3%	7.7%
Tier-1 Change	-3.8%	-3.4%
THRESHOLD	5	5
Accrual and Trading % of Loss	85.8%	89.5%

Regarding aggregate portfolio-level loan losses, the loss rate for 2013 is 7.5% versus an 8.1% level for 2012. The estimated "severely adverse loss" for the 18-firms comprising the 2013 results was $462 billion, comprised of an estimated $211 billion in consumer loan losses, $97 billion in estimated trading and counterparty losses, $93.4 billion in C&I and CRE losses, and $61 billion in securities and other losses. Notably, over 89% of all losses are driven by the accrual loan portfolio (68%) and potential trading losses (21%).

Year-over-year, the loss estimates for most loan categories stayed flat or declined, with the notable exception of commercial real estate (CRE) loans. Losses on commercial and industrial (C&I) portfolios declined to 6.8% from 8.2% relative to 2012 results, but remained significantly higher than historical experience of the banking industry. Though disclosure remained limited, it appeared that the Federal Reserve has adjusted its modeling approach from modeling groups of loans (by industry, credit quality and geography) to a transition path approach specific to given loan type. Within CRE, the loss rate increased from a 5% estimated level in 2012 to a 2013 level of 8%. While difficult to compare loss results due to modeling and economic scenario differences on year-over-year basis, the rise in expected CRE loss exposure may warrant increased focus for 2013 as U.S. commercial property indices continue to rise and are close to pre-crisis levels. It is also interesting to note that there is a somewhat unintuitive measure coming out of this year's stress-test. For the 2013 stress-test result, there is a dramatic decline in loss estimates for junior-lien loans and HELOCs. Even while first-lien mortgages showed a small increase (20 basis points) in the estimated portfolio loss rate (7.3% to 7.5%), the junior-lien/HELOC portfolio segment showed a full 3.6 percentage point improvement over the 2012 results, moving from 13.2% for 2012 to a much reduced 9.6% level for 2013. With a flat-to-slight increase in first-lien residential mortgage losses, it would be natural to assume a flat-to-higher level of loss for junior lien portfolios and HELOCs. This unintuitive result may, like CRE above, encourage some additional analysis and review to determine the underlying rationale for the significant improvement.

Overall loan balances declined by approximately $99.2 billion year-over-year, with CRE, junior-lien consumer, and HELOC loans leading the decline. Of note, commercial and industrial lending increased at a brisk 8.9% rate even while the loss estimate for this category improved from 8.2% to 6.8%. Given some of the recent market indicators that suggest an increased risk appetite and more aggressive pricing within this segment, evaluating stressed C&I exposure levels at a far more granular level may be prudent for banks experiencing significant growth in this loan category.

It is important to note that 2012 and 2013 results are not entirely comparable, as both the macroeconomic scenarios and modeling methodologies used for the analysis have changed. This makes it difficult to assess the magnitude of overall improvement in the banks' capital position.

It is also worth noting the disparities between the risk measures submitted by the large banks (for example JP Morgan, Goldman Sachs, Morgan Stanley) and the Federal Reserve System's (FRS) internal model estimates. For example, Goldman Sachs projected a tier-1 capital ratio of 8.6% whereas the FRS estimate was 5.8%, under a sharp economic downturn. Similar differences in the magnitude of impact exist across a number of submissions, indicating material differences in modelling methods and loss and revenue estimates. These disparities highlight the importance of benchmarking results and using multiple, conceptually sound modelling approaches, and the need for model validation that is supported by robust default, recovery, and pre-provision revenue data and analytics.

Summary of Comprehensive Capital Analysis and Review Results

On March 14, the Federal Reserve released the results of its Comprehensive Capital Analysis and Review (CCAR). The CCAR report assesses the quantitative and qualitative aspects of a firm's capital planning and risk measurement processes. For the 2013 CCAR review, two banks – Ally and BB&T – received objections to their capital plans. This means that the Federal Reserve must pre-approve any capital actions of these two institutions. For Ally the objection was based on both quantitative and qualitative criteria, while the objection to the BB&T capital plan was based, in part, on perceived weaknesses in the firm's capital planning process, which includes, in part, erroneous reporting of risk-weighted assets due to the incorrect assessment of unfunded commitments.

Beyond the two capital plan objections, Goldman Sachs and JPMorgan Chase received conditional approval for their capital plans. This means that all capital actions can proceed as planned; however, certain process weaknesses require remediation by the end of the third-quarter of 2013. Failure to properly address the identified weaknesses could risk possible Federal Reserve objection to the submitted capital plan for each institution. It is worthy to note that PPNR at broker banks is usually driven by the volatility of their trading portfolios (major source of earnings for these banks). This volatility increases during periods of stress thus affecting the PPNR and their ability to build reserves and capital under those scenarios (versus retail banks with usually more resilient and less volatile earnings for PPNR projection purposes).

Notably, the loss estimates for Goldman Sachs and JPMorgan Chase exhibit significant differences from the Federal Reserve modelled loss estimates. While JPMorgan Chase amended its submission from March 7, 2013 to show increases in loss estimates for residential and junior-lien/HELOC loans, the overall loss estimates of JPMorgan Chase are 62% of the Federal Reserve's estimate. Similarly, Goldman Sachs loss estimates are significantly below the Federal Reserves' estimates due, in large part, to a significant difference in analytical result. The Federal Reserve estimates over $2 billion in credit losses in a severe stress while Goldman Sachs' internal estimates reflect loss of $300 million, or 15% of the Federal Reserve's estimate. For example, the Goldman Sachs C&I loss rate estimate is 7.3% versus the Federal Reserve's estimate of 49.8%. This difference seems to suggest the need for additional detail.

Given some of the noted differences in loss estimates across several asset classes, particularly around residential mortgage, C&I and CRE, various modelling assumptions and methodology concerns exist. It remains unclear whether the challenges derive from the Federal Reserve's or the various banks' modeling assumptions. At this stage, the quality and granularity of data is a big issue when calculating and projecting the PPNR components. This, in turn, may affect the capital projections and the capital plan.

In December, using Stressed Expected Default Frequency (EDF) measures conditioned on the Federal Reserve's severely adverse scenario as default probabilities, Moody's Analytics estimated C&I loss rates under a range of loss-given default (LGD) assumptions for pseudo-portfolios of the banks modeled on published default rates. In the aggregate, Moody's Analytics' estimate of 6.7% - using a 50% LGD assumption - was closely aligned with the Fed's 6.8% for C&I loans. Although one might infer from this that the Federal Reserve used an average LGD of 50% for C&I loans, it is not possible to make such an inference without presupposing that the Federal Reserve's and Moody's Analytics' post-stress default probabilities were similar. However, what may be instructive is the observation that Stressed EDF measures based on the severely adverse scenario for many firms rise in a manner consistent with historical experience , and when they rise by more than may appear warranted by the experience of the 2008 financial crisis, it is largely due to the fact that the obligor would enter the Federal Reserve's hypothetical stress scenario from a higher level of credit risk than at the start of the 2008 recession.

C&I loss estimates derived from the banks' models were most closely aligned with Moody's Analytics estimates based on a 40% LGD assumption. The two banks whose C&I loss rate estimates were closest to Moody's Analytics were Goldman Sachs and JP Morgan.

Other interesting components of the March 14, 2013 capital plan review include:

» Many firms are planning significant share buybacks and dividend increases, returning capital to shareholders.
» There are several banks seeking to replace existing common equity with various forms of qualifying tier-2 capital.
» Two banks – Ally and American Express – took the opportunity to resubmit their capital plans prior to any final Federal Reserve decision on the plan. In American Express's case, the revision was made, in part, due to the Federal Reserve's analysis showing a breach of the 5% common equity threshold, derived in large part from a $3.1 billion difference in the Allowance for Loan and Lease Loss (ALLL) modelling approach.
» Only four banks failed to disclose their own internal loss estimates: Ally, Capital One, Fifth-Third, and SunTrust, highlighting some differences in transparency and disclosure expectations.
» $393 billion has been added to tier-one common equity since FYE 2008.
» The Federal Reserve opined that "…all 18 BHCs are on a path to successfully meet the Basel III requirements."
» There appears to be a need to improve various stress-testing processes in order to ensure capital planning "…is conducted in a well-controlled manner."

About Moody's Analytics Solutions for CCAR and Dodd Frank Act Stress Testing

Moody's Analytics comprehensive solution is modular, flexible, and encompasses three distinct tiers of design: 1) data infrastructure, 2) analytical models (internal and external), and 3) integrated management and regulatory reporting. The solution has been designed to ensure a comprehensive approach to all three of these elements, enabling regulatory compliance, operational efficiency and strategic business decisions. We also complement our enterprise-wide offering with data and expert implementation and advisory services.

For more information, please visit www.moodysanalytics.com/manageccaranddfast.

About Moody's Analytics

Moody's Analytics, a unit of Moody's Corporation, helps capital markets and credit risk management professionals worldwide respond to an evolving marketplace with confidence. The company offers unique tools and best practices for measuring and managing risk through expertise and experience in credit analysis, economic research and financial risk management. By offering leading-edge software and advisory services, as well as the proprietary credit research produced by Moody's Investors Service, Moody's Analytics integrates and customizes its offerings to address specific business challenges.

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MOODY'S ANALYTICS

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