Consistent projections of balance sheet, risk-weighted assets, and income

Model Symposium
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The views expressed in this presentation are those of the author and do not necessarily reflect the position of the Federal Reserve Bank of New York or the Federal Reserve System.
Consistency is hard to achieve

Changes to capital

Provisions

Net income

Capital Ratio

Changes to RWA

Change in asset mix

Change in asset amount

Change in asset quality
Even before projections need to vary with changes in macroeconomic conditions.
But consistency is critical

• If there is no consistency across models, the sum of the parts may be very different from what would occur in an adverse macroeconomic environment
  – Do riskiest borrowers refinance? Are credit standards tightening?
  – Does reducing risk of trading assets impair market making revenues?
  – Is the expectation for interest income in the AFS/Securities portfolio similar to the expectation for interest income when the same assets are directly held?

• If model errors are correlated, the capital forecast will be biased
Federal Reserve Approach I
Federal Reserve Approach II

Model Oversight Group
- Single group reviews all models
- Encourages consistency
- Eg. Connects modeling of MBS exposures in securities book to on balance real estate exposures

Modeling team
- Content experts

Model Validation Unit
- Encourages robust processes

Benchmark Models
- Alternate approaches to same question (eg. top down vs. bottom up, different specifications) can reveal inconsistencies

External Model Validation Council
- Insight from outside of Federal Reserve System on modeling approaches

Consistent, robust models of capital
Consistency across multiple dimensions

Consistent data:

- 18 CCAR BHCs, next including the CAPR firms
- Pro forma for acquisitions where practical

Consistent principles:

- Flight to quality is not consistent with the spirit of a stress test
- Revenues, expenses, assets, and risk weighted assets are linked
  - higher revenues come at a cost; expense cuts may not materialize as planned; growth strategies may not be deployed as planned
- Unexpected negative events may occur
Adapting a budgeting methodology to forecasting a stress case can be difficult

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<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>Interest income</th>
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Balances / Revenues / Provisions

• Severely adverse scenario: Increase in price of risk (BBB spreads), Decrease in LT treasury rates, ST rates remain at lower bound

• What might happen to loans?
  – Interest income:
    • Constant / lower interest income from OLD floating rate loans
    • Assuming constant portfolio risk (including new originations and existing borrower renegotiations) $\Rightarrow$ Higher interest income
    • Assuming risk decreases $\Rightarrow$ Higher or lower interest income
  – Loan balances:
    • Are same borrowers more or less risky? (given adverse macro environment)
    • How are maturing and defaulting loans replaced? (if at all)
    • How do new originations compare to the existing portfolio?

• While next slides show what happened historically, just because we see it 2007-8, doesn’t mean it is in the spirit of a stress test
Balances / Revenues / Provisions

- In aggregate, when price of risk increases, loan balances stop growing and change in price of risk of loan portfolio dominates de-risking in the loan portfolio (coefficient on BBB spread is positive for interest income)

Source: Pro forma adjusted Y-9C data for sum of 18 CCAR firms. Includes firms only as they become Y-9C filers.
Compensation

• Compensation to assets has been trending down, but is not nearly as variable as the stock market.

Source: Pro forma adjusted Y-9C data for sum of 18 CCAR firms. Includes firms only as they become Y-9C filers.
Deposits

• Deposit rates vary negatively with balances – even after controlling for the fall in ST rates and even in crisis period
Models vs. Expert Judgment

• Hard to evaluate if expert judgment is consistent across models (even if the same expert is doing everything)

• But, unvalidated models may be no better than expert judgment
  – Would we rather be right or consistently, replicably wrong?

BUT

• Experts can be wrong and have been

• Understand how and when different methods produce different answers
Challenges and trade-offs

Pros
• Deeper understanding of implicit and explicit assumptions
• Challenges and testing of assumptions across models

Cons
• Benefits of expert judgment likely diminished
• Hard to translate some implicit assumptions
• Time and resource intensive
A foolish consistency is the hobgoblin of little minds, adored by little statesmen and philosophers and divines.

Ralph Waldo Emerson