Stress Testing

Til Schuermann*

IMF Conference on Operationalizing Systemic Risk Monitoring

Washington DC, May 27, 2010

* Any views expressed represent those of the author only and not necessarily those of the Federal Reserve Bank of New York or the Federal Reserve System.

Disclaimer

The views in this presentation are those of the speakers and do not necessarily reflect the views of the Federal Reserve Bank of New York or the Federal Reserve System.

Prior to the Crisis

Some observations before the crisis on stress testing……

- Business line and product-level stress testing regimes were reasonably well-developed
  - Corporate-wide credit risk stress testing still at a developmental stage
- No firm had a fully-developed program of integrated stress testing that captured all major financial risks on a firm-wide basis
- Relative to market developments, counterparty credit risk management and stress-testing practices need to be strengthened
  - Dealers should focus is on the interplay of their proprietary risk positions with those of their counterparties

Lessons from the Crisis

Senior Supervisors Group II (Oct. 2009)

- Disparity between the risks that their firms took and those that their boards of directors perceived the firms to be taking.
  - Insufficient evidence of active board involvement in setting the risk appetite for firms in a way that recognizes the implications of that risk taking

- Rarely did supervisors see firms share with their boards and senior management
  - Robust measures of risk exposures (and related limits),
  - the level of capital that the firm would need to maintain after sustaining a loss of the magnitude of the risk measure, and
  - the actions that management could take to restore capital after sustaining such a loss.

- Firms have recognized the need to move beyond traditional stress tests involving deteriorating credit quality, rating downgrades, and/or historically based scenarios and to look increasingly at hypothetical situations that are more systemic in nature and longer in duration.

Key Question

- How much capital do you need to withstand a severe, prolonged economic stress

And

- Retain sufficient financial resources to maintain the confidence of your counterparties, funds providers, and regulators?

- Going concern, maintain credit intermediation

Expectations for capital planning/adequacy processes

- Bank holding companies (BHCs) should have in place processes to ensure that they hold adequate capital to remain a going-concern under adverse conditions.
  - Hold sufficient capital to maintain access to funding, continue to serve as credit intermediaries and continue operations in an adverse environment
- Proper and relevant time horizons
  - One-year is arbitrary, and insufficient
- A credible range of scenarios
  - Macroeconomic and market-wide events, firm-specific stress events
  - Relevant to the firm's risk profile and business activity, as well as the capital-planning horizon
- Project losses and resources taking into account relevant accounting, tax and regulatory considerations
- Estimate sources and uses of capital
  - Stressed pre-provision net revenue
  - Dividends, stock repurchases, contracted acquisitions, and increases to the allowance for loan losses
- Consider estimation uncertainty

SCAP: Methods for Projecting Losses and Revenue

- Basic calculation

$$K_{t+1} = K_t + Resources - Losses - Dividends$$

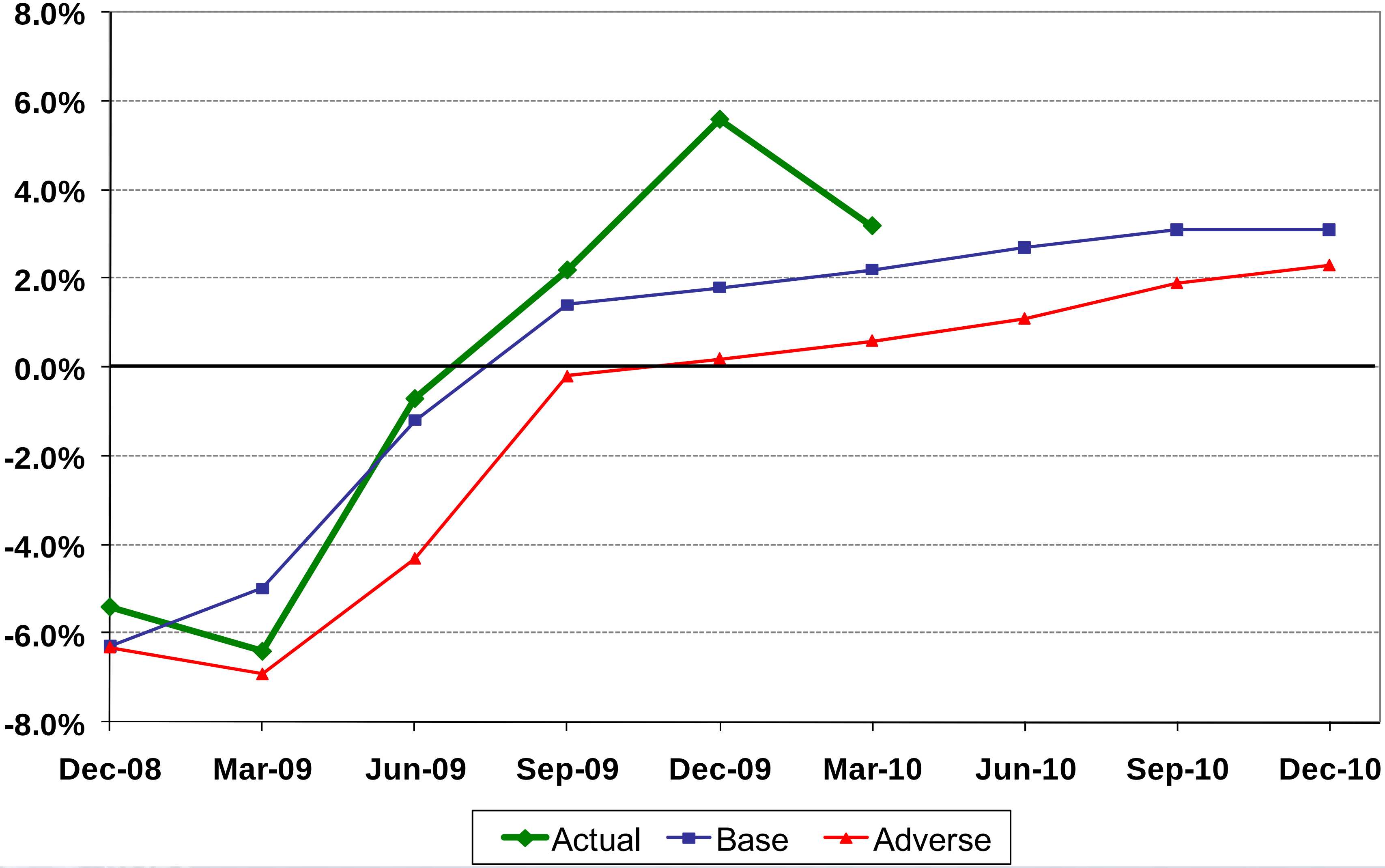
- Resources to absorb losses
  - Revenue after operating expenses, but before credit costs
  - Reserve release / build by the end of 2010 for expected losses in 2011

- Project losses on
  - Loan portfolios – cash flow losses
  - Securities held for investment – accounting recognition of market losses
  - Trading portfolios (including derivatives) – mark to market shock

- Calculate impact on regulatory capital based on supervisors' estimates
  - After taxes
  - After preferred dividends
- Compare to capital ratio targets to assess any needed capital buffer

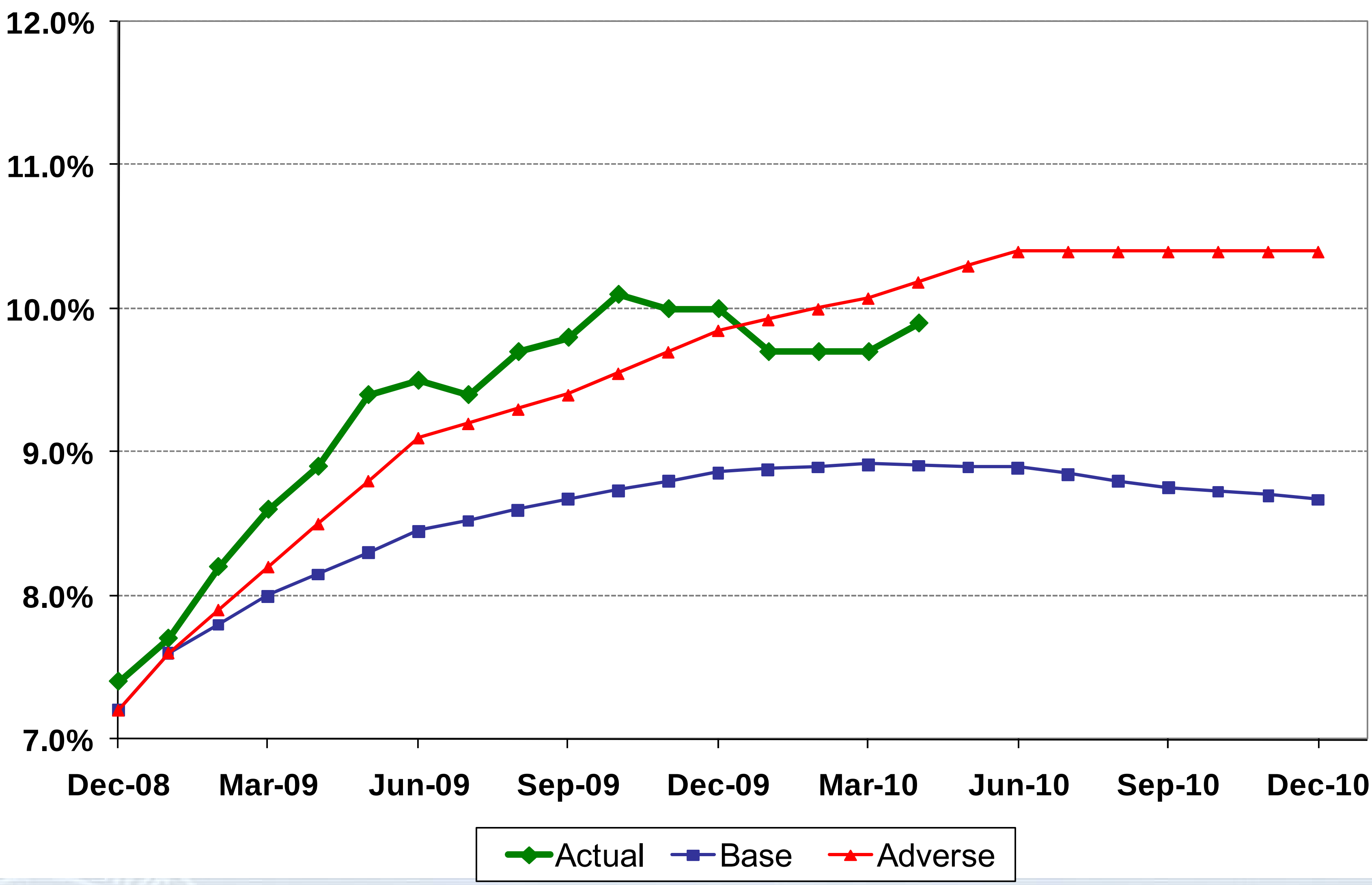
Macro Scenarios

GDP (Annual Rate)



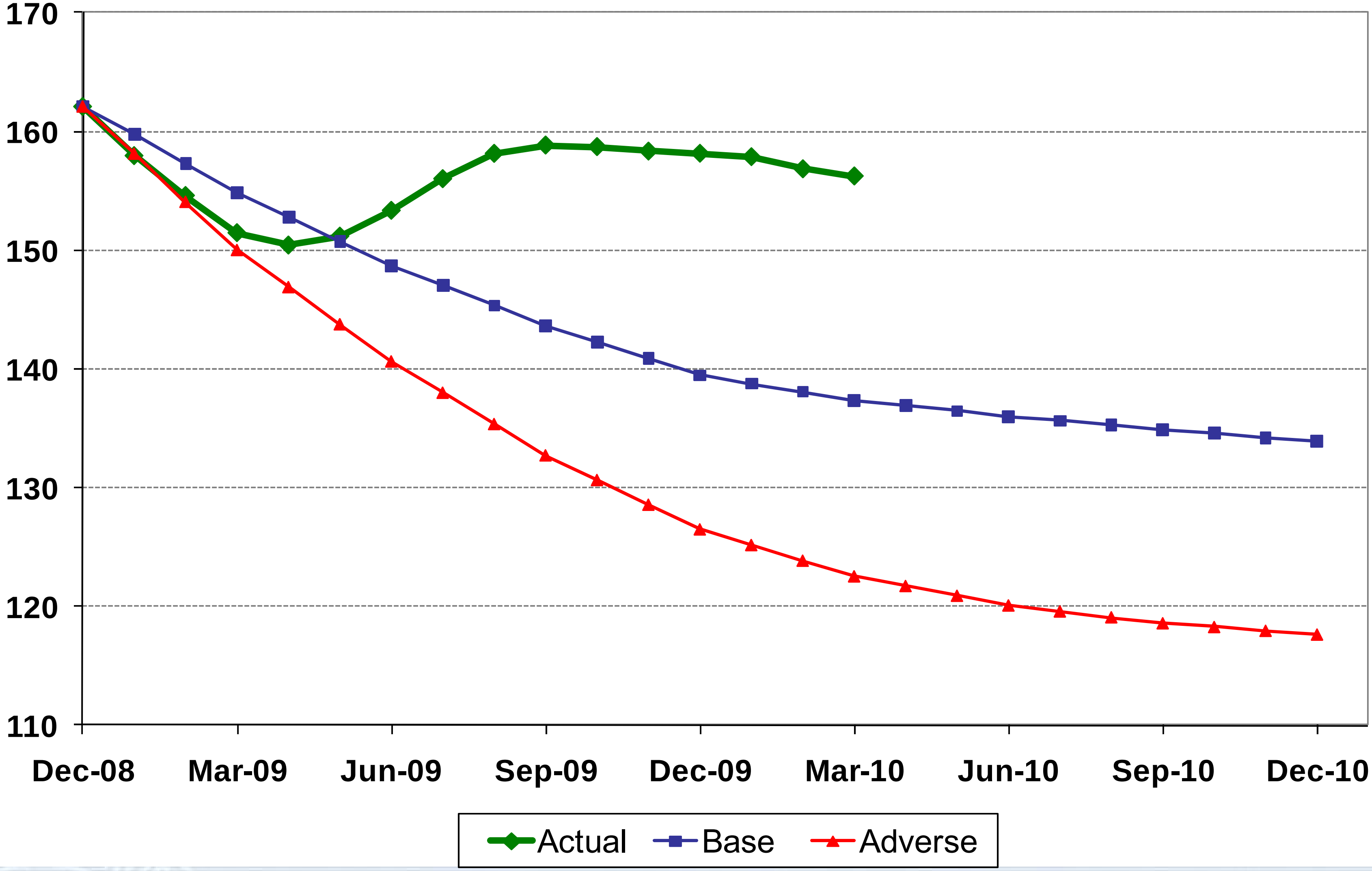
Macro Scenarios

Unemployment Rate



Macro Scenarios

Case-Shiller 10-City (Level)



From macro-scenario to micro-outcomes

- Concretely, the micro, not the macro, matters
  - Care about micro-outcomes (losses, revenues)
- Little guidance was provided on how to translate macro-scenario to the micro-outcomes
  - Credit/lending: indicative loss ranges
  - Market/trading: specific time period (market risk factor changes from June 30 – Dec 31, 2008)
- Supervisors are usually reluctant to specify stress test parameters narrowly
- But: macro-scenario provided a focal point for discussion, concrete guidance on “state of the world”

From macro-scenario to micro-outcomes (cont'd)

- Mapping from macro-scenario to micro-outcomes is hard
  - What is the "beta" of lending volume or pricing to GDP growth?
  - Sometimes you get "lucky": beta of unemployment on credit card charge-offs is about 1
  - Some businesses may be counter-cyclical (e.g. collateral of auto leasing becomes more valuable in recession)'
    - But: do you want to count on that in a tail stress scenario?

- Next actual stress (crisis) can't be the last one – you just prepared for it

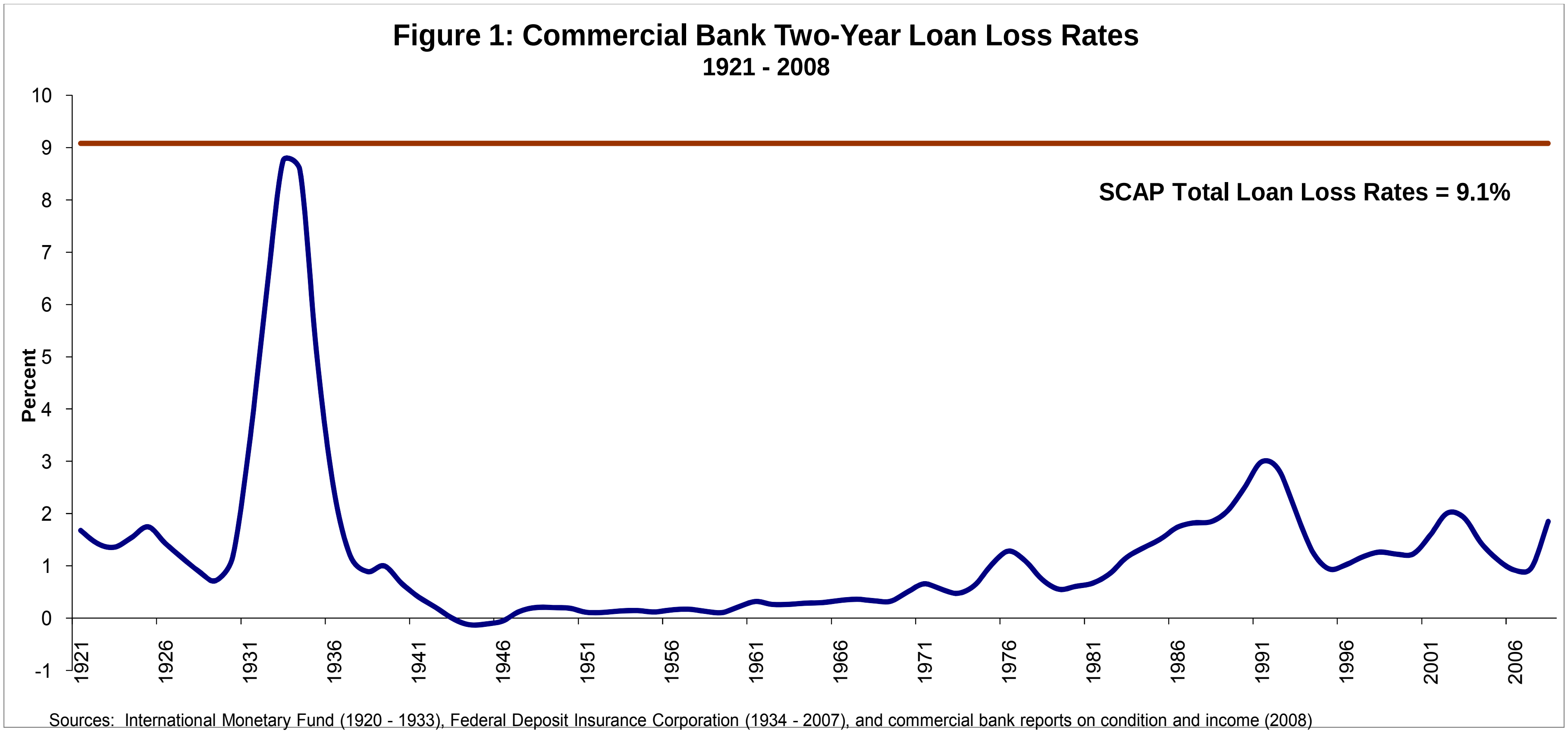
- We're "living" it again with current strains in euro-land
  - What is the impact on consumer finance from a Greek sovereign default?

Indicative Loss Rate Ranges

Table 1: Indicative Loss Rates Provided to BHCs for SCAP (cumulative two-year, in percent)

	Baseline	More Adverse
First Lien Mortgages	5 – 6	7 – 8.5
Prime	1.5 – 2.5	3 – 4
Alt-A	7.5 – 9.5	9.5 – 13
Subprime	15 – 20	21 – 28
Second/Junior Lien Mortgages	9 – 12	12 – 16
Closed-end Junior Liens	18 – 20	22 – 25
HELOCs	6 – 8	8 – 11
C&I Loans	3 – 4	5 – 8
CRE	5 – 7.5	9 – 12
Construction	8 – 12	15 – 18
Multifamily	3.5 – 6.5	10 – 11
Nonfarm, Non-residential	4 – 5	7 – 9
Credit Cards	12 – 17	18 – 20
Other Consumer	4 – 6	8 – 12
Other Loans	2 – 4	4 – 10

High Loan Loss Rates by Historical Standards



Summary of Results

- Aggregate results for the 19 BHCs participating in the SCAP in the more adverse scenario
  - Projected losses of $600B
  - Projected resources to absorb losses of $360B
  - Net capital need of $185B
    - $75B after capital actions

- BHC-specific results
  - 10 BHCs identified as needing additional capital
  - Considerable variation in losses, revenue, and capital needs across BHCs

Firms significantly increased the amount of common equity in 2009

- The 19 BHCs added nearly $200 B in common equity through issuance, preferred conversions, asset sales and other capital actions in 2009

- The combined Tier 1 Common ratio increased from 5.3% in 2008:Q4 to 7.8% in 2009:Q3
  - After adjusting for capital actions for TARP repayment in 2009:Q4, the ratio rose to 8.3%

- The combined Tier 1 ratio increased from 10.8% in 2008:Q4 to 11.8% in 2009:Q3
  - After adjusting for capital actions for TARP repayment in 2009:Q4, the ratio fell to 11.2%

GRAB
<MENU> to return

EquityMA

More Deal Info | Target Info | Acquirer Info | Acquisition Detail

Target:GMAC LLC GM1 US Price:
Industry:Diversified Banking Inst SIC Code: PERSONL CREDIT
Country:U.S.

Acquirer:United States of America 3352Z US Price:
Industry:Sovereign SIC Code: GENL GOVT NEC
Country:U.S.

Announced Date: 5/21/09
Completion Date: 5/21/09 % owned:
Status: Completed % acquired:

Currency: USD
Annd tot. value: 7500.0000 Mln Announced premium:
Final tot. val: 7500.0000 Mln Final premium:
Paym't Type: Cash Arbitrage profit:
Cash Terms: 7500.000000 Mln Cash Value:
Stock Terms: Comp Bid Prem:
Net Debt: Comp Bid Date:
Nature of Bid: Friendly Action ID:37502101

MANDATORY CONVERTIBLE PFD MCPS. SOURCE: {NSN KKONCX3T6SQP <GO>}.

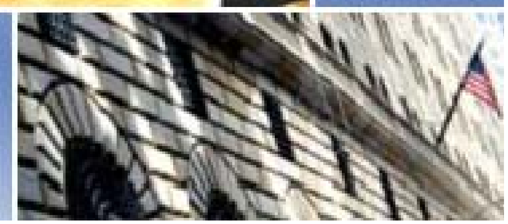
Australia 61 2 9777 8600 Brazil 5511 3048 4500 Europe 44 20 7330 7500 Germany 49 69 9204 1210 Hong Kong 852 2977 6000
Japan 81 3 3201 8900 Singapore 65 6212 1000 U.S. 1 212 318 2000
H655-361-1 22-May-09 9:34:22

Stress Testing

Til Schuermann*

IMF Conference on Operationalizing Systemic Risk Monitoring

Washington DC, May 27, 2010



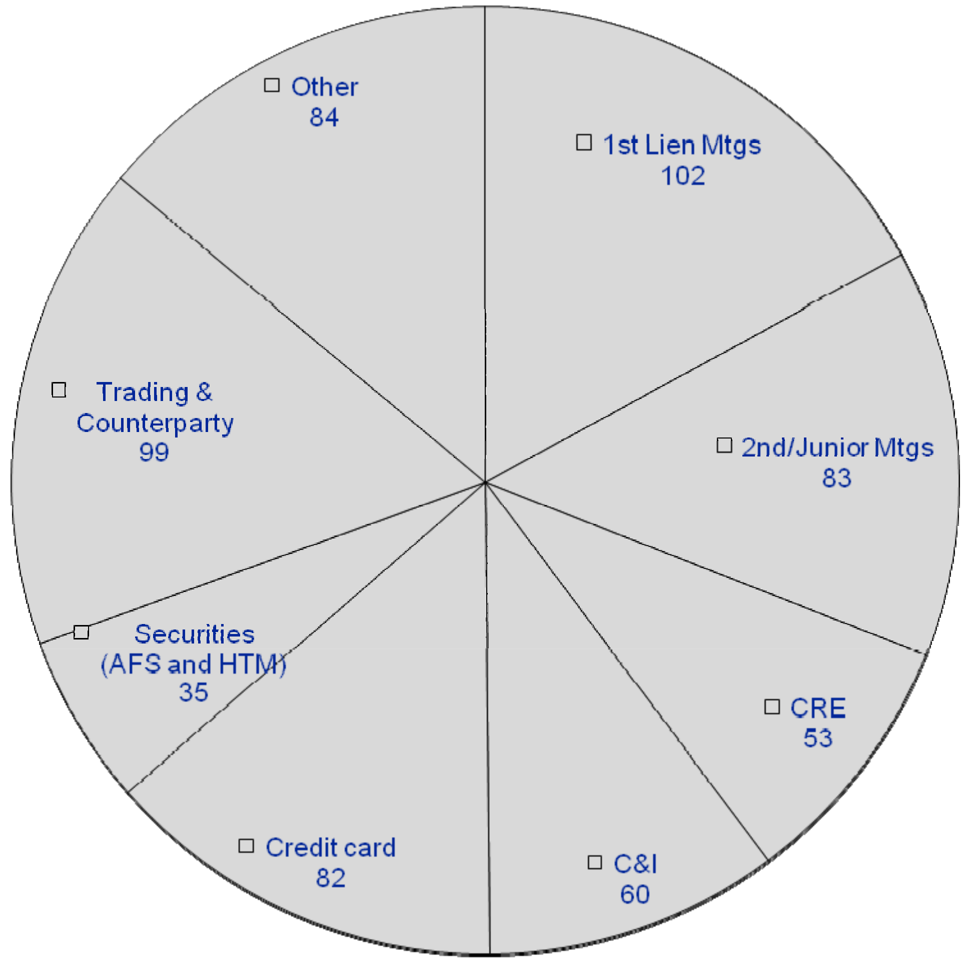
* Any views expressed represent those of the author only and not necessarily those of the Federal Reserve Bank of New York or the Federal Reserve System.

Graveyard

Losses by Type in the More Adverse Scenario

- $600B in total losses
  - 8 categories

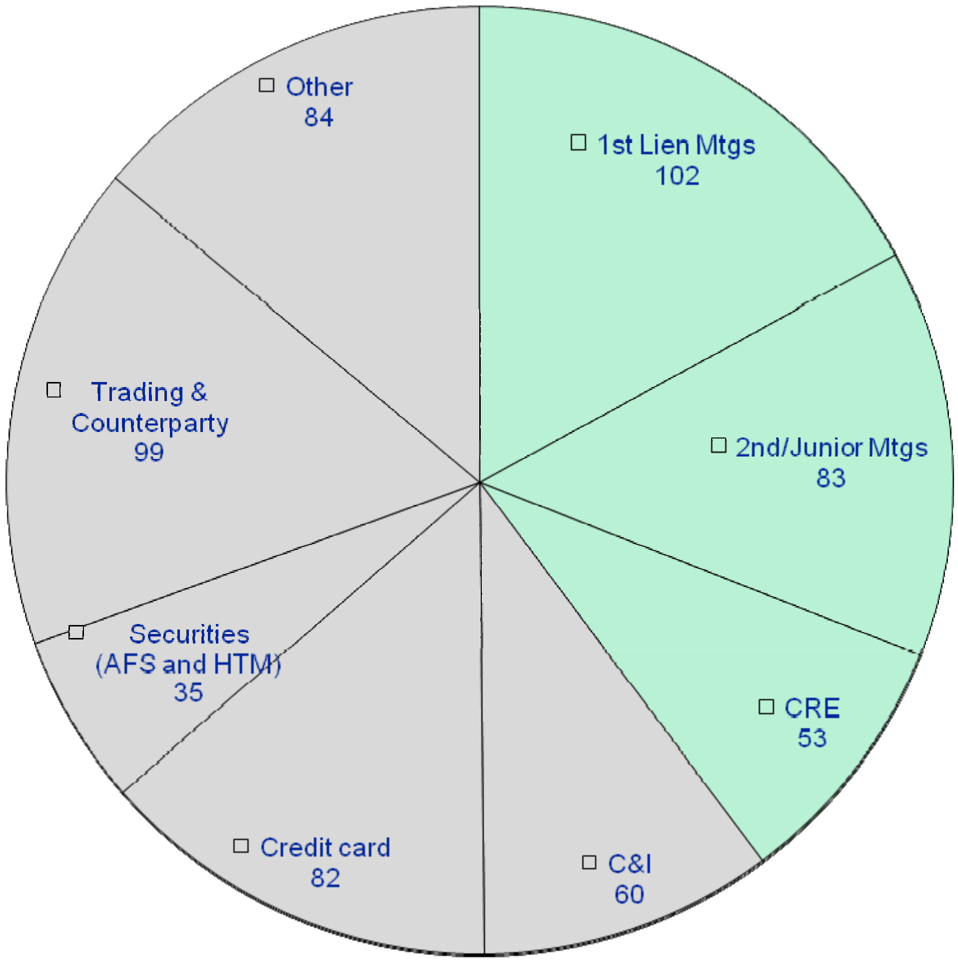
Aggregate Projected Losses ($B)



Losses by Type in the More Adverse Scenario

- $600B in total losses
  - 8 categories
- $240B real estate-related losses
  - 40% of total

Aggregate Projected Losses ($B)



Losses by Type in the More Adverse Scenario

- $600B in total losses
  - 8 categories
- $240B real estate-related losses
  - 40% of total
- $100B trading-related losses
  - 15% of total
  - 5 BHCs with large trading portfolios
  - Drivers:
    - Counterparty
    - Private equity
    - Traded credit products

Aggregate Projected Losses ($B)