

# The Evolving Complexity of Capital Regulation

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# Overview



- ✓ How did capital regulation become so complex?
  - What were the authorities trying to accomplish?
  - What went wrong?
- ✓ Why complexity has itself become a problem
  - Deadweight costs of compliance
  - Opacity of regulations to
    - Market
    - Regulators
    - And, in some instances, bankers themselves
    - Impedes monitoring the monitors
  - Partially redundant constraints obscure how system may respond to shocks
- ✓ Why is regulatory simplification so difficult?

# The Original Basel Accord

## *The Journey Begins*



# A First Attempt to Regulate a Global Industry



- ✓ The Basel Committee on Banking Supervision turned to capital regulation from shared sense of rising risk in the banking system
- ✓ Each country regulated capital, but used different measures of capital and the magnitude against which it was measured.
- ✓ The Original Accord determined
  - The definition of regulatory capital
  - The scheme for risk-weighting assets and off-b/s positions
  - The minimum standards that all internationally active banks must meet

# Required Years to Negotiate



- ✓ The definition of regulatory capital proved the most difficult element
  - German view
  - French view
- ✓ Compromise produced two kinds of regulatory capital: Tier 1 and Tier 2
  - Illustrated one force driving complexity
- ✓ Agreed to a very simple risk-weight scheme
  - Main objective: to incentivize banks to hold higher quality more liquid assets
  - Secondary objective: to facilitate international interbank market
  - Tertiary objective: to favor mortgage lending

# Outcome was Basel Accord



- ✓ The Accord defined
  - 2 kinds of regulatory capital
  - 4 risk categories of assets
  - 2 minimum capital ratios
    - 4% Tier 1 to RWA
    - 8% Tier 1 plus Tier 2 to RWA
    - Levels never justified, but remained for 20 years
- ✓ Remarkably simple and transparent
  - Could be written on the back of a postcard
  - Could be computed by any numerate clerk
  - Provided an improved way to compare capital strength across international banks
    - Of course differences in accounting practices distorted measures as did differences in tax laws

# Concerns Arose Over Regulatory Arbitrage

- ✓ A bank intent on increasing its exposure to risk without raising its regulatory capital requirements had several ready options
  - Shift toward higher risk assets within the 100% bucket
  - Shift in structure of loan from direct loan to emerging market government (100% risk weight) to short-term loan to government-owned bank (20%)
  - Transformation of portfolio of loans into securities with repurchase of first loss tranche
- ✓ Also growing awareness that banks had developed more sophisticated approaches to measuring and managing credit risk
  - Believed better alignment between regulatory risk weights and banks own measures of risk would eliminate incentives for arbitrage

# **Basel II**

The effort to increase the  
risk sensitivity of capital requirements



# Basel II

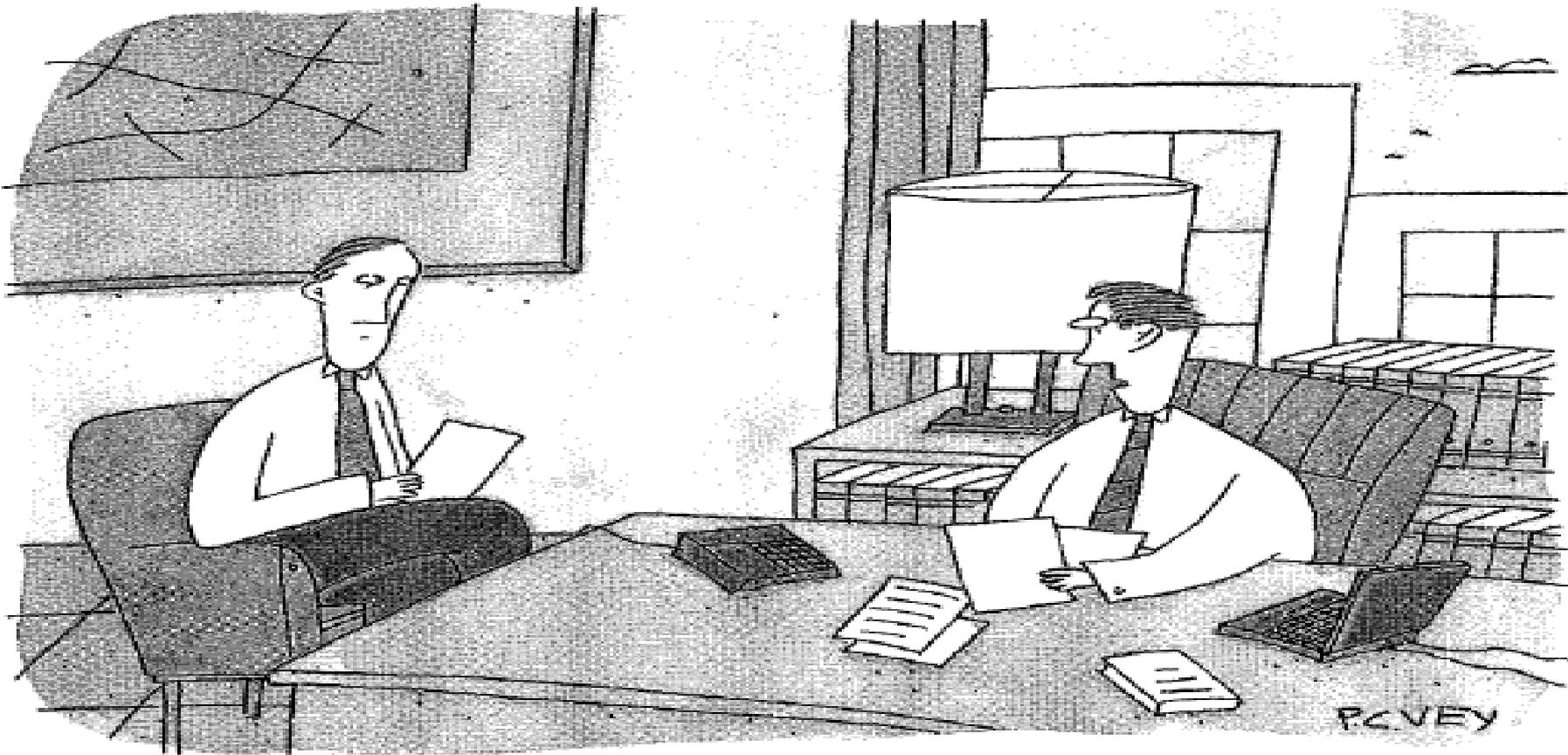
- ✓ Retained definition of regulatory capital
- ✓ Retained 4%/8% minimum required ratios
  - Again without justification
- ✓ But greatly complicated the RWA denominator
  - In quest to make capital regulation more risk sensitive, Basel II added considerable complexity
  - Risk buckets expanded to over 200,000\*\*
  - Computation of regulatory capital requirement entails over 200 million calculations\*\*
    - Defied effective monitoring by supervisors or market
    - Impeded comparison across banks or for the same bank over time

\*5 categories in some countries

\*\*Haldane (2011)

# Greater Complexity Did not Stop Regulatory Arbitrage

*Regulation and supervision is a continual contest between regulatees and less-well-paid & less-well informed regulators*



*"These new regulations will fundamentally change the way we get around them."*

# Example: CDOs



- ✓ An innovation that averted prudential oversight and obscured the transfer of risk
- ✓ Financial institutions sold assets to off-balance sheet entities, SIVs, that funded purchases by selling claims to the cash flows. Mitigated risk thru
  - Diversification
  - Overcollateralization
  - Subordination of tranches
  - Private insurance
- ✓ Each mortgage-backed CDO might contain ca. 750k mortgages\*
  - Accompanying documentation might run 30k pages

\*Haldane, 2009

# Increased vulnerability of system to crisis



- ✓ Inflated volume of debt based on same underlying collateral
  - Implicit leverage defied market or supervisory scrutiny
- ✓ Many of securities were short-term commercial paper
  - Liquidity risk addressed with 364-day lines of credit from banks
  - Maturity limit averted capital requirement for standby line of credit 365 days and over
- ✓ When value of CDOs questioned, markets seized up because of difficulty in linking to value of the underlying collateral

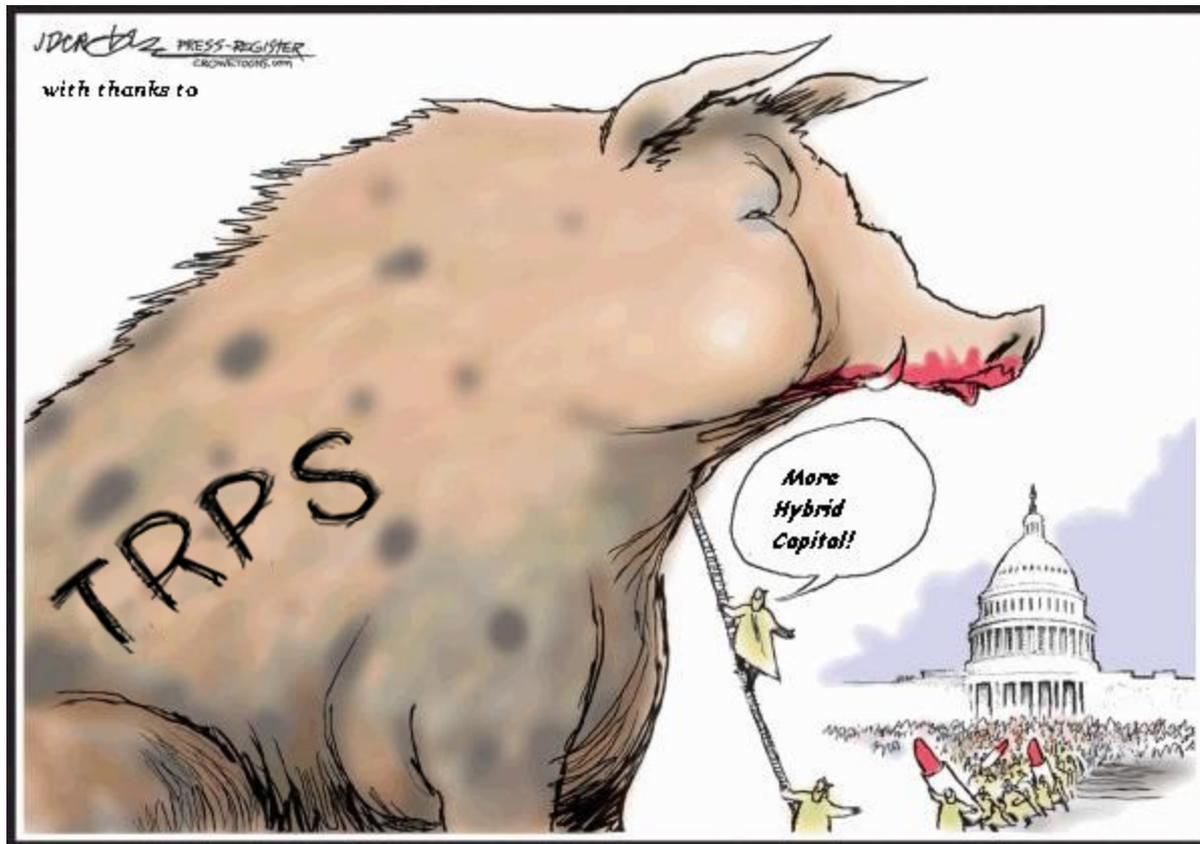
**The Numerator in the RWA Ratio was also  
Subject to Erosion Under Basel II**



# Complexity of Definition of Regulatory Capital Invited Lobbying and Innovations to Reduce Burden

- ✓ Basel I defined two kinds of regulatory capital: Tier 1 and Tier 2
  - Bankers view Tier 1 capital as most burdensome because mainly equity
  - Virtually all tax systems favor debt over equity creating strong incentives to design instruments that
    - Regulatory authorities will count as Tier 1 capital and
    - Tax authorities will treat as debt and permit deduction of interest payments
- ✓ Thus investment bankers were incentivized to create new instruments that
  - Would seem sufficiently like equity to qualify for Tier 1 capital in the eyes of the regulators.
  - Would seem sufficiently like debt to qualify for tax deductions in the eyes of the tax authorities.

# *Tier 1 was Degraded by innovations in hybrid capital*



# Permitted Instruments with Features of Debt to Comprise as Much as 50% of Tier I

- ✓ TruPS were popular in the US, Step-up Perpetuals were popular in Europe
  - Equity proportion of Tier 1 permitted to fall to 2% of RWA →
  - RWA/Equity = 50:1
- ✓ But as conventionally measured, implicit permissible expansion of leverage was even more reckless
  - Assume RWAs are roughly 50% of Total Assets\*
  - Permissible leverage (Equity / Total Assets) increased to 100:1!
  - Basel Committee lacked clarity re: role of Tier 1 as going concern capital
- ✓ Most hybrids proved worthless in sustaining banks as going concerns or in protecting tax payers in the crisis

*\*Actual among G-SIBs varied from 22.93% to 73.66% at yearend 2014.*

# Basel II failed to

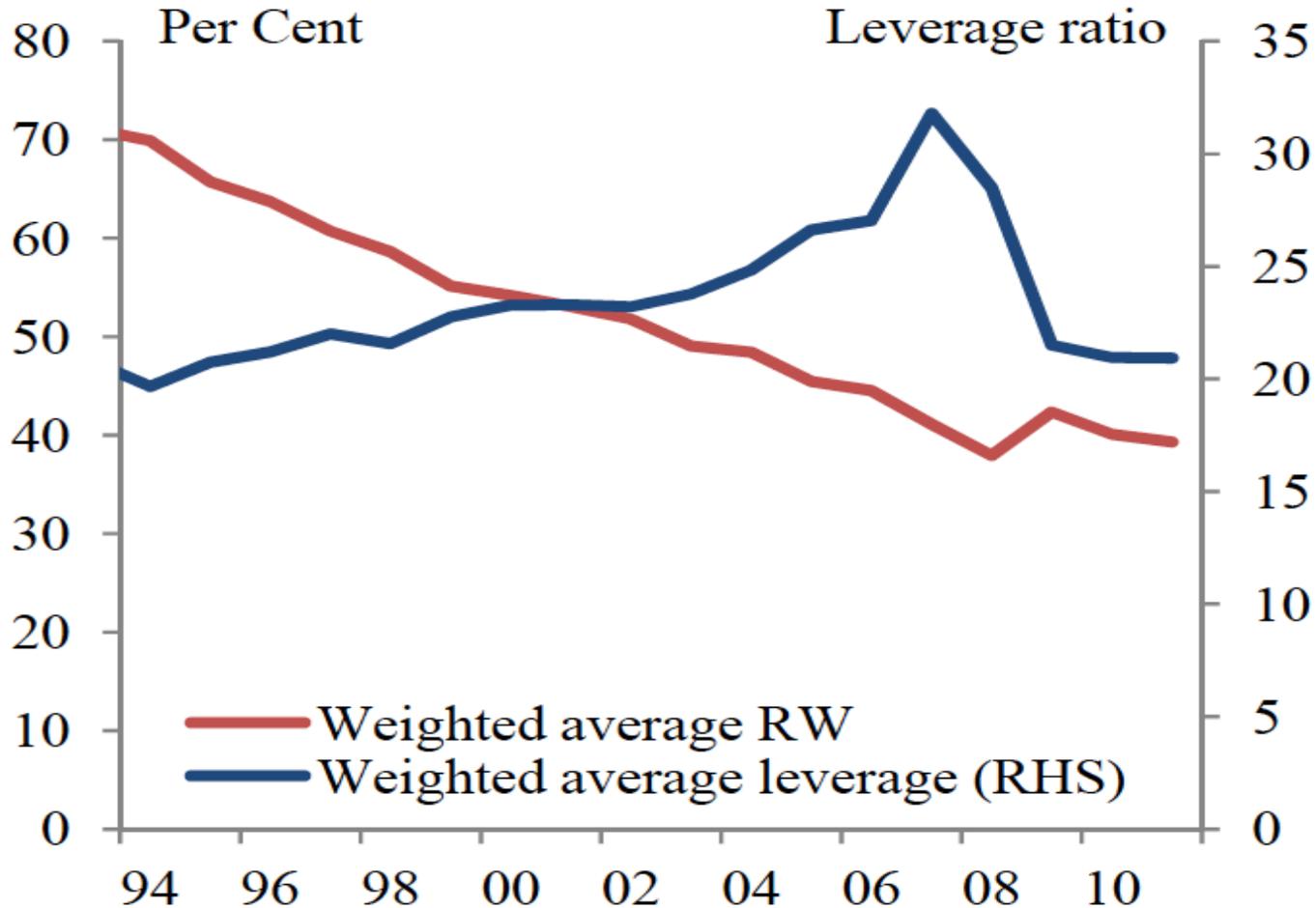
1. Warn of emerging weaknesses in the banking system
  2. Identify the weakest banks during the crisis
  3. Provide sufficient loss absorption capacity in the banking system
- ✓ Troubled banks reported higher risk-weight capital ratios than stronger banks
  - ✓ Risk-weighted ratios remained remarkably steady up to and during crisis
    - *Citi Tier 1 ratio peaked at 11.8% when market cap was roughly 1% of account value of assets*

# Problems Arising from Complexity in Capital Regulation

- ✓ Opaque
  - Difficult to verify compliance or exercise effective supervision
  - Impede effective market surveillance and discipline
- ✓ Facilitates lobbying and innovations to undermine regulatory constraints
  - Highly technical regulations largely escape public scrutiny that might otherwise serve as a counterforce
  - Increases danger of regulatory capture
- ✓ Increases costs of implementation, monitoring and compliance
  - Growth in regulatory workforce and in compliance functions in industry should raise questions about opportunity costs
  - Prior to 2008 very difficult to argue that resources enhanced safety and soundness
- ✓ “Regulatory capital ratios may have become too complex to verify, too error-prone to be reliably robust and too leaden-footed to enable prompt corrective action”\*

\*Haldane’s (2011) summary of possible criticisms

# RWAs Declined Even as Leverage Increased



Source: Haldane, 2013, "Turning the Red Tape Tide." Weighted averages for 16 European and U.S. G-SIBs

# Basel III

How did regulatory reform address the problem of complexity?



*By introducing still more complications*

# Acceleration of New Legislation & Rulemaking



- ✓ Elaborate financial reforms in virtually every major country
  - Most will affect G-SIBs
- ✓ Dodd-Frank reforms (2010) still being implemented
  - 848 pages vs. 37 pages for Glass-Steagall (1933)
  - Tens of thousands of pages of rulemaking and guidance
- ✓ A virtual blizzard of new legislation and rulemaking since 2010



**We'll focus on the subassembly regarding  
capital regulation**



# Tightened Definition of Regulatory Capital, but Multiplied Number of Ratios

- ✓ Tier 1 capital recast as “Going Concern Capital”
  - Purged of innovative instruments that facilitated greatly increased leverage by stealth
  - But retains reliance on accounting values that differ across countries and badly lag economic values in an economic downturn
    - Did eliminate some of the most dubious accounting entries such as Deferred Tax Assets
  - Introduces an odd distinction between
    - CET1 (Common Equity Tier 1)
    - Additional Tier 1 (Non-Common Equity Tier 1)
- ✓ Tier 2 recast as “Gone Concern Capital”
  - Importance downgraded, matters only as a component of total capital
  - But still retained
- ✓ Introduced TLAC (Total Loss Absorbing Capital)
  - Equity and debt claims qualifying as Tier 1 and Tier 2 plus other external debt that is unsecured, subordinated to most other claims, with remaining maturity > 1 year
  - Cannot count regulatory buffers
  - Must be 16-20% of RWA and at least 2x the Tier 1 Leverage Ratio\*
  - At least 33% of TLAC is expected to be debt other than Tier 1 and Tier 2

## *Increased Complexity in RWA Capital Framework from 2 ratios to >12 (expressed as % of RWA)*

|   | Common Equity Tier 1 | Tier 1 Capital | Tier 2 Capital | Total Capital           |
|---|----------------------|----------------|----------------|-------------------------|
| Minimum                                   | 4.5%                 | 6.0%           | 2.0%           | 8.0%                    |
| Conservation Buffer                       | 2.5%                 |                |                |                         |
| Minimum <u>plus</u> Conservation Buffer   | 7.0%                 | 8.5%           | 2.0%           | 10.5%                   |
| Countercyclical Buffer Range              | 0-2.5%               |                |                |                         |
| SIFI Add On range*                        | 0-3.5%               |                |                |                         |
| Discretionary Pillar 2 Add On             | ?                    | ?              |                | ?                       |
| Minimum <u>plus</u> maximum Basel buffers | 13%                  | 14.5%          | 2.0%           | 16.5%                   |
| TLAC                                      |                      |                |                | 16-20%                  |
| Totals                                    | 7.0%-13.0%           | 8.5%-14.5%     | 2.0%           | 36.5%<br>Including TLAC |

\*US SIFI surcharge will be at least 200 basis points higher, with larger increments based on SIFI index

The Basel Committee took note of the uncomfortable fact that a simple leverage ratio outperformed more complex risk-based ratios



# *Risk-based Ratios did not help explain failures*

## *Leverage Ratios did*

### Risk-Based Capital Versus Leverage for Major Global Banks

| Variable                 | Model 1             | Model 2         | Model 3           |
|--------------------------|---------------------|-----------------|-------------------|
| Leverage ratio           | -0.37 ***<br>(0.13) |                 | -0.35**<br>(0.13) |
| Risk-based capital ratio |                     | -0.16<br>(0.11) | -0.07<br>(0.11)   |

Notes: For all models, the dependent variable is "failure." Standard errors are shown in brackets.

(\*) Significant at the 10 percent level

(\*\*) Significant at the 5 percent level

(\*\*\*) Significant at the 1 percent level

Haldane and Madouros (2012) based on the Laeven/Valencia (2010) classification of 37 major banks that required intervention during the crisis).

# + Leverage Ratios

## ✓ Standard Leverage Ratio

- Tier 1 capital to average consolidated on b/s assets
- All banks, minimum of 4%

## ✓ Supplementary Leverage Ratio

- Tier 1 capital to on b/s assets and off b/s exposures
  - Off b/s exposures include derivatives exposures, securities transactions financing exposures, and other off b/s commitments
- All banks with >\$250 bn in assets or foreign exposure >\$10 bn, minimum of 3%

## ✓ Enhanced Supplementary Leverage Ratio

- Tier 1 capital to on b/s and off b/s exposures
- US-based G-SIBs, minimum 5% applied to holding company, 6% applied to insured depository institutions

# + CCAR

## (Comprehensive Capital Analysis & Review)

- ✓ Banks must show that they can meet 5 different minimum capital ratios under a regulator-specified severely adverse stress test over a 9-quarter period
  1. Common equity tier 1 ratio of 4%
  2. Tier 1 risk-based capital ratio of 5.5%
  3. Total risk-based capital ratio of 8%
  4. Tier 1 Standard Leverage Ratio 4%

# The Outcome of Post-Crisis Reforms



- ✓ **39** different minimum regulatory requirements for U.S. G-SIBs
  - Does not take account of transitional arrangements and parallel runs
  - Does not take account of ratios imposed by regulators abroad
  - Does include
    - RWA requirements
    - Leverage requirements
    - CCAR & DFAST requirements
    - Broad TLAC requirements

# Regulatory Capital Requirements for U.S. G-SIBs

|                                 |      | Denominator   |  | C  | D   |
|---------------------------------|------|---|--|--|---|
|                                 |      | <u>RWA Advanced Approaches</u>  | <u>RWA Standardized Floor<sup>f</sup></u>  | <u>Average On-Balance Sheet Assets<sup>c</sup></u>                             | <u>Average On-Balance-Sheet Assets + Off-Balance Sheet Items</u>  |
| Numerator                       | CET1 | 1   | <b>Minimum Common Equity Tier 1 Ratio (CET1) = 4.5%<sup>a</sup></b>                    | <b>Minimum CET1 = 4.5%</b>   |   |
|                                 |      | 2   | <b>CET1 Capital Conservation Buffer</b> 2.5% above Minimum CET1 Ratio <sup>d</sup>     | <b>CET1 Capital Conservation Buffer</b> 2.5% above Minimum CET1 Ratio          |   |
|                                 |      | 3   | <b>CET1 Counter-Cyclical Buffer</b> , 0-2.5% above Capital Conservation Buffer         | <b>CET1 Counter-Cyclical Buffer</b> , 0-2.5% above Capital Conservation Buffer |   |
|                                 |      | 4   | <b>G-SIB Minimum CET1 (method 1)</b> = 7% + Method 1 G-SIB Surcharge <sup>f</sup>      | <b>CCAR Post-Stress Test CET1 Ratio</b> ≥ 4.5%                                 |   |
|                                 |      | 5   | <b>G-SIB Minimum CET1 (method 2)</b> = 7% + Method 2 G-SIB Surcharge                   | <b>DFAST Post-Stress Test CET1 Ratio</b> ≥ 4.5%                                |   |
| Tier 1                          | 6    | <b>Minimum Tier 1 Ratio</b> = 6% <sup>a</sup>   | <b>Minimum Tier 1 Ratio</b> = 6%   | <b>Standard Leverage Ratio</b> ≥ 4% minimum <sup>a</sup>                       | <b>Supplementary Leverage Ratio<sup>b</sup></b> for Advanced Approaches Bank <sup>a</sup> ≥ 3%                      |
|                                 | 7    | <b>Tier 1 Capital Conservation Buffer</b> 2.5% above Minimum Tier 1 Ratio               | <b>Tier 1 Capital Conservation Buffer</b> 2.5% above Minimum Tier 1 Ratio              |  | <b>Enhanced Supplemental Leverage Ratio for G-SIB holding companies</b> ≥ 5%  |
|                                 | 8    | <b>G-SIB Minimum Tier 1 Ratio (method 1)</b> = 8.5% + Method 1 G-SIB Surcharge          |  |  | <b>Enhanced Supplemental Leverage Ratio for Insured Depository Institutions</b> within G-SIB holding companies ≥ 6% |
|                                 | 9    | <b>G-SIB Minimum Tier 1 Ratio (method 2)</b> = 8.5% + Method 1 G-SIB Surcharge          |  |  | <b>CCAR Post-Stress Test Minimum Leverage Ratio</b> ≥ 4%  |
|                                 | 10   |   |  |  | <b>DFAST Post-Stress Test Minimum Leverage Ratio</b> ≥ 4%   |
|                                 | 11   |   | <b>CCAR Post-Stress Test Tier 1 Minimum Ratio</b> ≥ 6%                                 |  |   |
| 12                              |      | <b>DFAST Post-Stress Test Tier 1 Minimum Ratio</b> ≥ 6%                                 |  |  |   |
| Total Capital = Tier 1 + Tier 2 | 13   | <b>Minimum Total Capital Ratio</b> = 8% <sup>a</sup>                                    | <b>Minimum Total Capital Ratio</b> = 8%  |  |   |
|                                 | 14   | <b>Total Capital Conservation Buffer</b> , Total Capital 2.5% above Minimum Total Ratio | <b>Total Capital Conservation Buffer</b> , 2.5% above Minimum Total Ratio              |  |   |
|                                 | 15   | <b>G-SIB Minimum Total Capital Ratio (method 1)</b> = 10.5% + Method 1 G-SIB surcharge  |  |  |   |
|                                 | 16   | <b>G-SIB Minimum Total Capital Ratio (method 2)</b> = 10.5% + Method 1 G-SIB surcharge  |  |  |   |
|                                 | 17   |   | <b>CCAR Post-Stress Test Total Capital Minimum Ratio</b> ≥ 8%                          |  |   |
|                                 | 18   |   | <b>DFAST Post-Stress Test Total Capital Minimum Ratio</b> ≥ 8%                         |  |   |
| External TLAC                   | 20   | <b>Minimum External TLAC Ratio</b> ≥ 18%  | <b>Minimum External TLAC Ratio</b> ≥ 18%   |  | <b>Minimum External TLAC Ratio</b> ≥ 9.5%   |
|                                 | 21   | <b>External TLAC Buffer</b> ≥ 2.5% + Method 1 G-SIB surcharge + Countercyclical Buffer  | <b>External TLAC Buffer</b> ≥ 2.5% + Method 1 G-SIB surcharge + Countercyclical Buffer |  |   |
| External Long-Term Debt (LTD)   | 22   | <b>Minimum LTD Ratio</b> ≥ 6% + Method 2 G-SIB surcharge                                |  |  | <b>Minimum External LTD Ratio</b> ≥ 4.5%  |

**Given the existing structure of capital requirements, what kinds of simplifications could be made?**



# A (somewhat) simplified set of ratios

| Numerator                     | Denominator                               |   |  |
|-------------------------------|---|---|--|
|                               | A   | B   |  |
|                               | <u>RWA Standardized Floor<sup>f</sup></u> | <u>Average On-Balance-Sheet Assets + Off-Balance Sheet Items</u>                      |  |
| CET1                          | 1   | Minimum CET1 = 4.5%   | Supplementary Leverage Ratio for Advanced Approaches Bank $\geq 3\%$   |
|                               | 2   | CET1 Capital Conservation Buffer 2.5% above Minimum CET1 Ratio                        | Enhanced Supplemental Leverage Ratio for G-SIB holding companies $\geq 5\%$  |
|                               | 3   | CET1 Counter-Cyclical Buffer, 0-2.5% above Capital Conservation Buffer                | Enhanced Supplemental Leverage Ratio for Insured Depository Institutions within G-SIB holding companies $\geq 6\%$ |
|                               | 4   | CCAR Post-Stress Test CET1 Ratio $\geq 4.5\%$   | CCAR Post-Stress Test Minimum Leverage Ratio $\geq 4\%$  |
| Tier 1                        | 5   | CCAR Post-Stress Test Tier 1 Minimum Ratio $\geq 6\%$                                 |  |
| External TLAC                 | 6   | Minimum External TLAC Ratio $\geq 18\%$   | Minimum External TLAC Ratio $\geq 9.5\%$   |
|                               | 7   | External TLAC Buffer $\geq 2.5\%$ + Method 1 G-SIB surcharge + Countercyclical Buffer |  |
| External Long-Term Debt (LTD) | 8   |   | Minimum External LTD Ratio $\geq 4.5\%$  |

# The Market Value of the Leverage Ratio Contains Valuable Information & Should Not Be Ignored

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**Requiring a substantial tranche of Calomiris/Herring style CoCos as part of TLAC could provide a powerful incentive for timely recapitalization**

If complexity contributed to the crisis,  
why did reform lead to still more complexity?



# Path Dependent Process of Regulation

- ✓ Haldane (2013) *“History locks in idiosyncrasies and complexities of the past, generating a steadily rising tide of red tape.”*
- ✓ Broad resistance to simplification from “experts”
  - Bankers who have most to gain from identifying and exploiting opaque loopholes
    - Great complexity inevitably leads to more and more opaque loopholes
  - Legislators who rely on flows of funding from lobbyists representing regulated firms to fund election campaigns
  - Regulators, lawyers and tax accountants who have invested large amounts of human capital in dealing with complexity

# Cost of Increasing Complexity

- ✓ The costs of maintaining and enforcing the system
  - Growth in number of regulators and compliance personnel
    - Much of this is a deadweight cost that should be measure in what these individuals could be doing in the productive sector
    - Oddly, no collection of data that might shed light on compliance costs
- ✓ Complexity advantages large institutions that can afford the fixed costs to identify and exploit loopholes
- ✓ May not produce desired outcome
  - E.g. Did heavy resources devoted to risk-sensitive capital requirements produce a safer system?
    - A simple leverage ratio performed substantially better in separating strong banks from weak

What might be done?



# Basel Committee

## Task Force on Simplicity and Comparability

- ✓ Discussion paper: “The regulatory framework: balancing risk sensitivity, simplicity and comparability” (July 2013)
- ✓ “Potential ideas” included
  - Explicitly recognizing simplicity as an additional objective
  - Enhancing disclosure
  - Utilizing added floors and benchmarks to mitigate the consequences of complexity
  - Reconsider the linkage between internal and regulatory models
  - Limit national discretion and improve supervisory consistency
- ✓ Scant evidence to date that it has had an impact

Most reform proposals focus on tinkering around the margins of the existing structure



But if the process leads to an outcome of staggering complexity, perhaps some attention should be focused on the process itself

“In physical and natural sciences, complexity is often a fact of life and exogenous, but *[in financial systems]* it is usually a demon of our own design”\*

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**What would it take to exorcise the demon  
in the United States?**

Andrew Lo, “Complexity, Concentration and Contagion: A Comment, 2011