The Procyclicality Effects of Bank Capital Regulation

by Rafael Repullo and Javier Suarez

Discussant: Haibin Zhu

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*The views do not necessarily reflect those of the BIS.

Summary of the paper

- A simple model with deep insights on the procyclicality issue related to capital regulation
  - Two-stage, dynamic equilibrium model
  - Key assumptions:
    - Uncertainties in loan quality
    - Frictions in capital-raising by banks
    - Losses related to capital shortages
  - Problem to be solved: banks' optimal capital holding
    - Time variation of bank capital / capital buffers
    - Credit rationing
  - Policy options to mitigate procyclicality

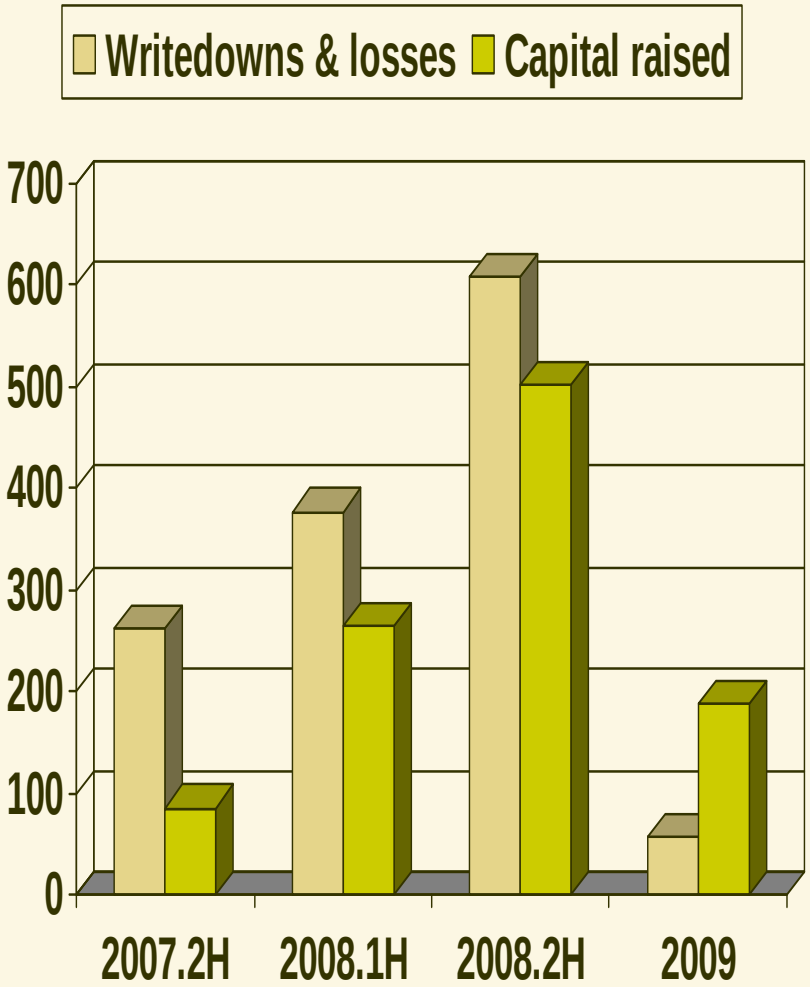
- Important contributions to the literature

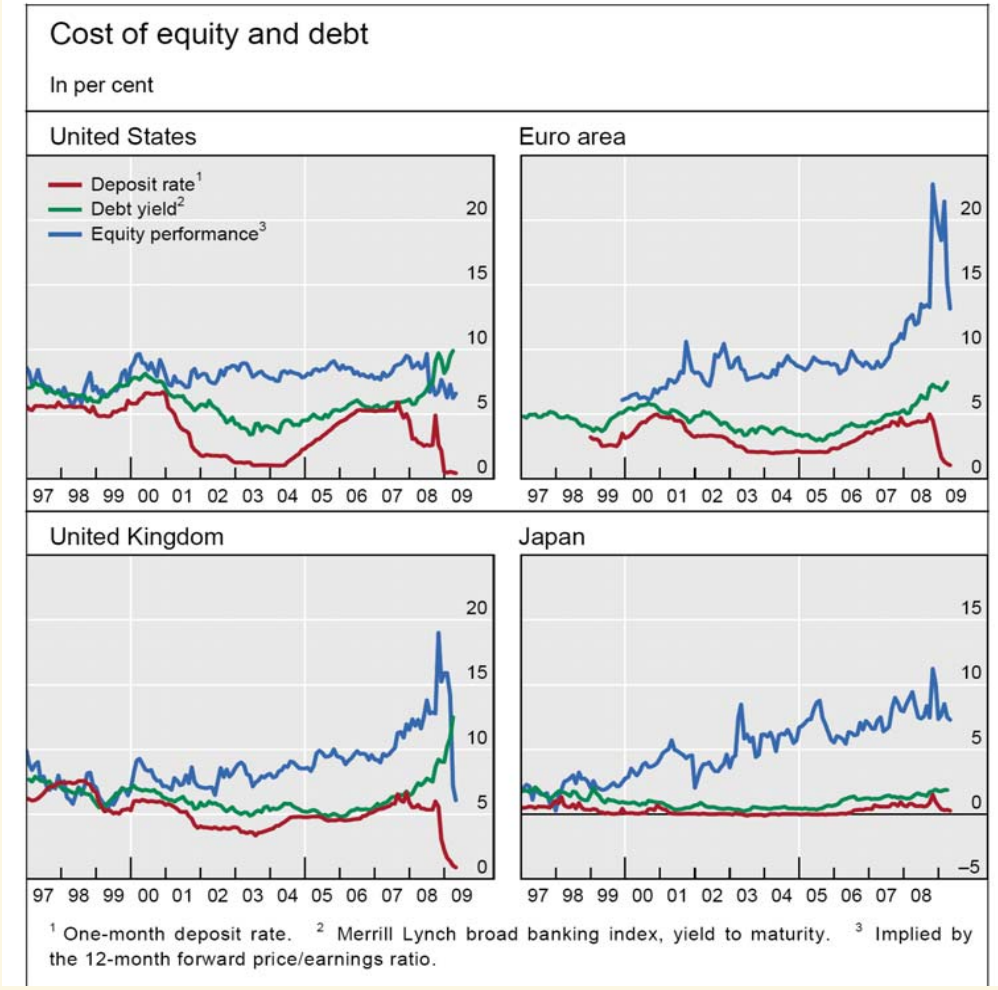
  – Minimum capital requirement ≠ actual capital holding
    - Previous studies (a long list, omitted here) have focused on the procyclicality in regulatory capital under Basel II
    - Capital buffer decision is crucial

  – Procyclicality ≠ cyclical movements in bank credit
    - Procyclicality is a relative term → excessive relative to a benchmark (Basel I, no capital requirement)

Procyclicality related to capital regulation

- Necessary conditions
  - Capital requirements affect banks' lending capacity
  - Borrowers have no alternative funding source
- In the ongoing international financial and economic crisis
  - Deleveraging of banks under the pressure of capital shortage
  - Funding sources from the capital market (wholesale funding, debt market, REIT) are equally vulnerable
  - Greenlaw, Hatzius, Kashyap and Shin (2008): the real impact of the deleveraging process


Writedowns & losses
Capital raised
700
600
500
400
300
200
100
0
2007.2H
2008.1H
2008.2H
2009


Cost of equity and debt
In per cent
United States
Euro area
United Kingdom
Japan
Deposit rate[1]
Debt yield[2]
Equity performance[3]
97 98 99 00 01 02 03 04 05 06 07 08 09
[1] One-month deposit rate. [2] Merrill Lynch broad banking index, yield to maturity. [3] Implied by the 12-month forward price/earnings ratio.

Recent initiatives in addressing procyclicality issues in the financial system

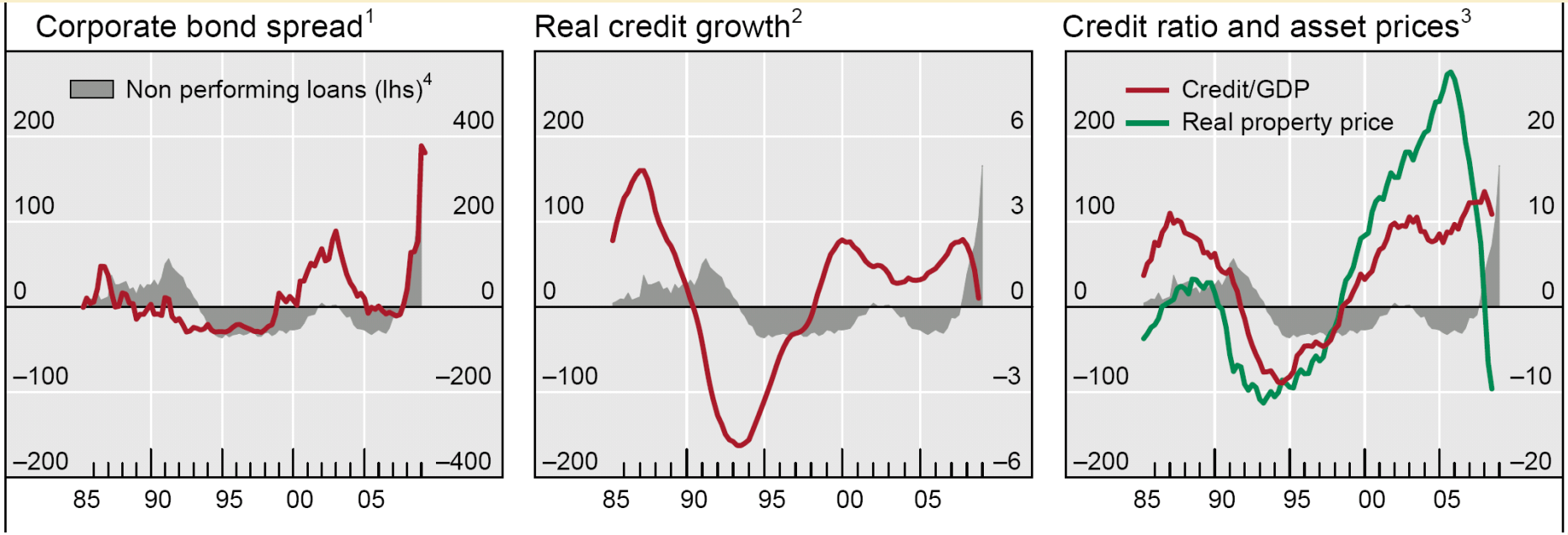
- Various proposals: G20, FSF (now FSB), BCBS, Geneva report
- Policy recommendations on bank capital to mitigate procyclicality
  - Option 1: adjustment in capital buffers or adoption of complementary measures
    - Examples: capital insurance (Kashyap et al, 2008); leverage requirements (US, Switzerland); dynamic provisions (Spain)
    - Inconsistent with the objective of Basel II: to align regulatory capital with economic capital

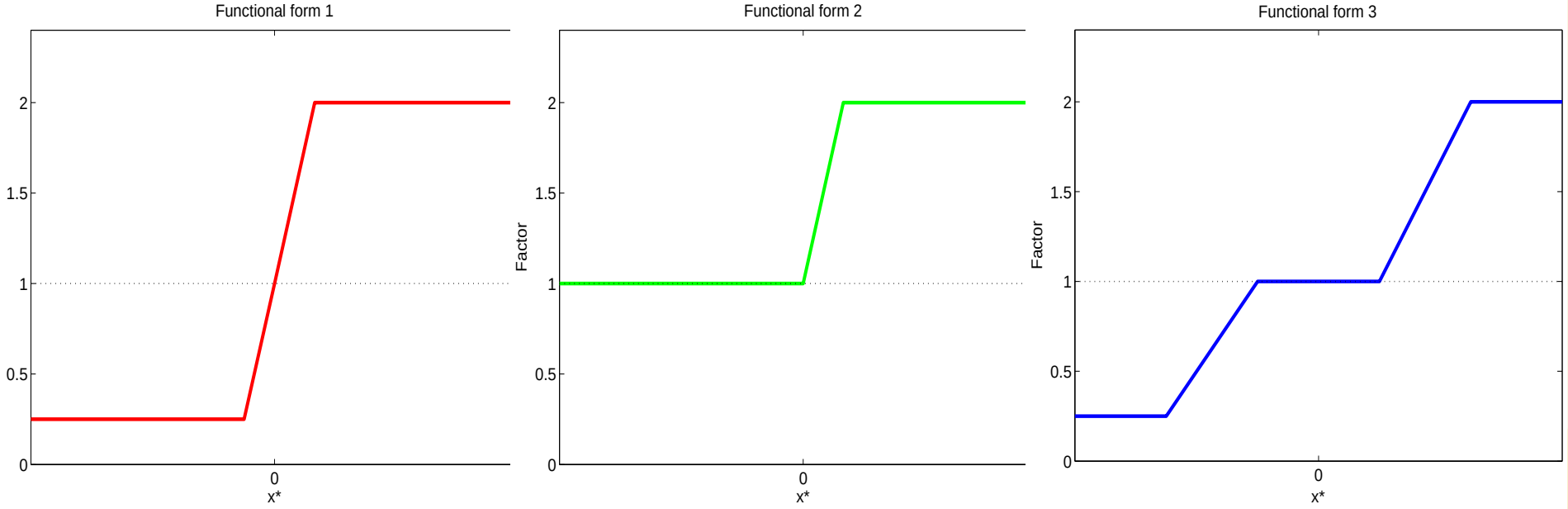
- Option 2: to smooth the input parameters, e.g. use through-the-cycle risk parameters
  - Risk measurement: the time variation in underlying risk
  - TTC risk parameters are not appropriate for short-term loans
  - BCBS: to maintain the risk sensitivity of the inputs and focus on dampening the outputs

- Option 3: to smooth the outputs
  - Gordy and Howells (2006): counter-cyclical indexing rule
  - This paper: counter-cyclical target default rates
  - Similar idea: BCBS, FSB, Geneva report, etc

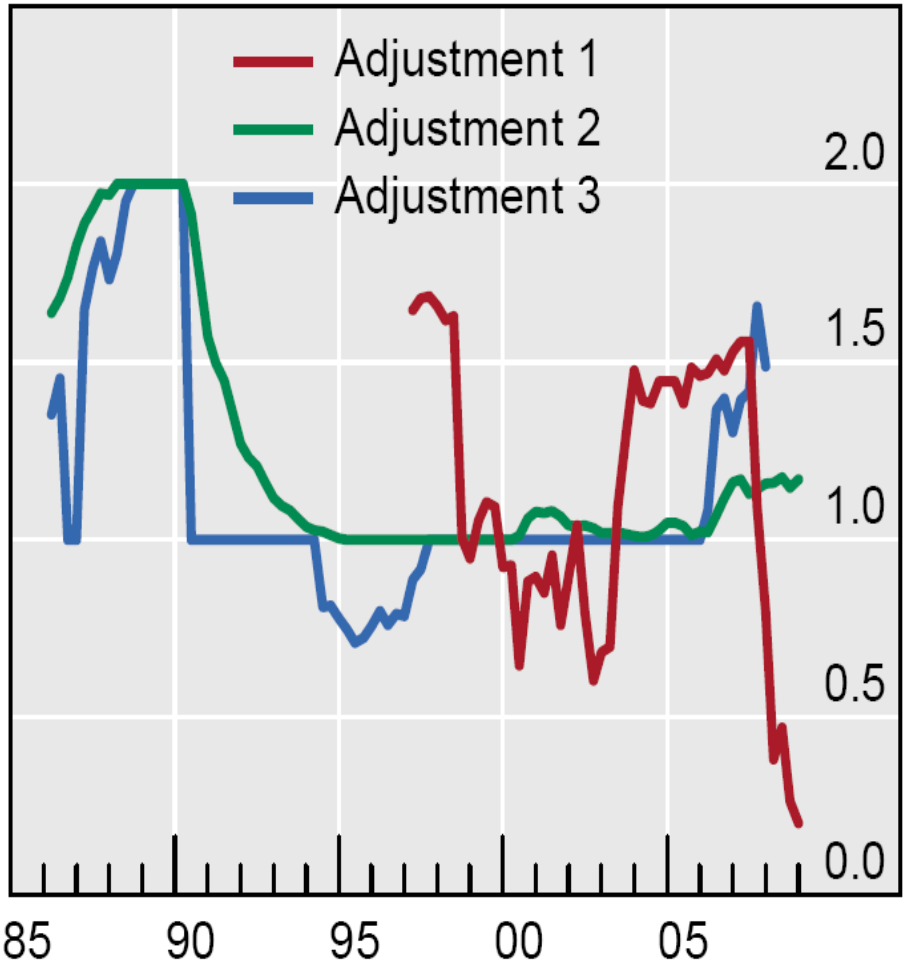
  - Challenge #1 (objective): what is the optimal tradeoff between safety and efficiency?
  - Challenge #2 (implementation)
    - The choice of conditional variables
    - The functional form linking conditional variables and the minimum capital requirement

- Illustrative examples
  - Gordy (2009): BBB corporate bond spreads + symmetric adjustment for small deviations
  - Goodhart and Persaud (2008): credit growth + one-side adjustment
  - Borio and Drehmann (2009): combination of imbalances in credit and house prices + symmetric adjustment for large deviations
  - It is not an easy task to develop a robust rule

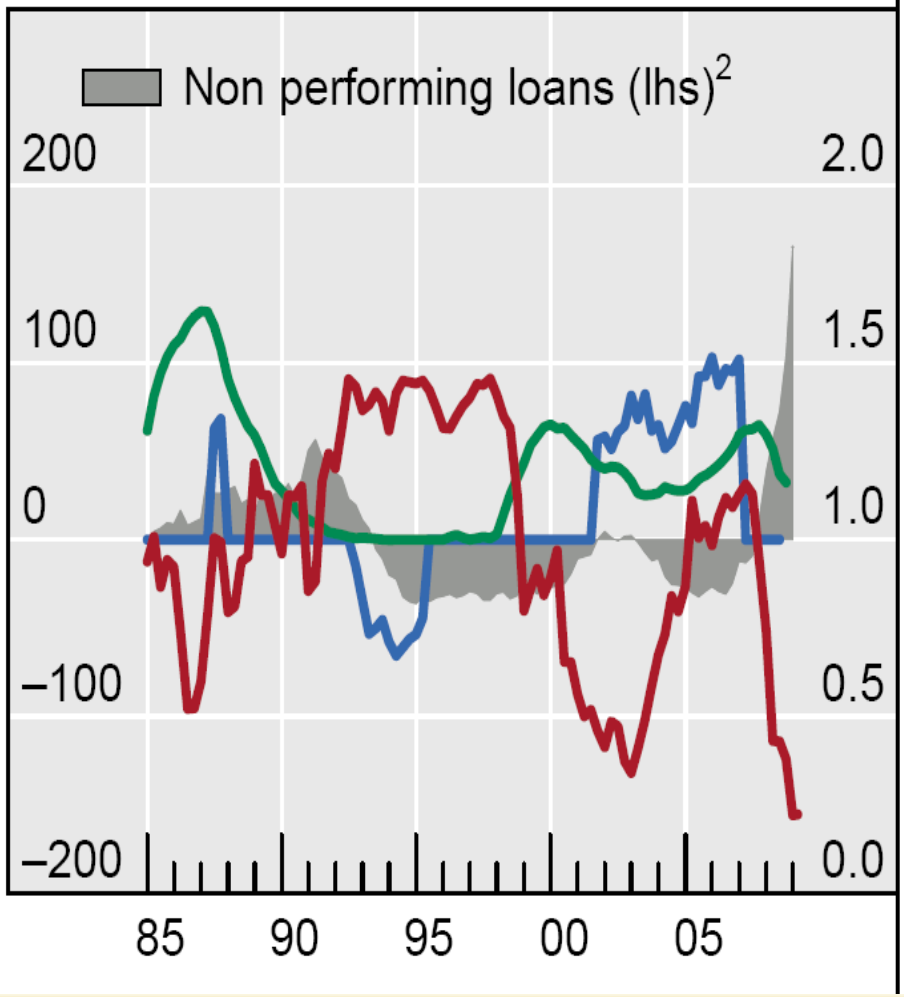

Corporate bond spread[1]
Non performing loans (lhs)[4]
200
100
0
–100
–200
400
200
0
–200
–400
85
90
95
00
05
Real credit growth[2]
200
100
0
–100
–200
6
3
0
–3
–6
85
90
95
00
05
Credit ratio and asset prices[3]
Credit/GDP
Real property price
200
100
0
–100
–200
20
10
0
–10
–20
85
90
95
00
05


Functional form 1
Functional form 2
Functional form 3
Factor
2
1.5
1
0.5
0
0
x*

United Kingdom



United States



Suggestion for extensions

- The simplified model is very helpful for illustrative purpose, but at the cost of practical relevance, particularly the quantitative relevance
  - Sensitivity analysis will be helpful
- What remains to be addressed (some listed in Section 7)
  - Loan demand is artificially given
  - Portfolio composition and risk profile are abstracted
  - No feedback effect from the banking sector to the real economy
  - Borio and Zhu (2008): the capital framework effect of Basel II (improvement in risk measurement and pricing)