Regulating bank dividends: are countercyclical buffers really useable in bad times?

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Disclaimers

- This is work in progress.
- The views expressed here are those of the author and not necessarily those of the SBS or PUCP.

Usual claims

- Regulators seem very confident:

"An essential element of the new regulatory capital Framework is the build-up in good times of buffers that can be drawn down in periods of stress."

The Basel Committee's response to the financial crisis: report to the G20

"The Countercyclical Capital Buffer would be built up when aggregate credit growth is judged to be associated with a build-up of system-wide risk, and drawn down during stressed periods."

Proposal for a Directive of The European Parliament and of The Council on the access to the activity of credit institutions and the prudential supervision of credit institutions and investment firms.

Less usual claims

- Academics ~~are~~ were more candid:

"What should the corporation do about dividend policy? We don´t know."

Black, Fischer (1976) "The Dividend Puzzle" JPM 2(2)

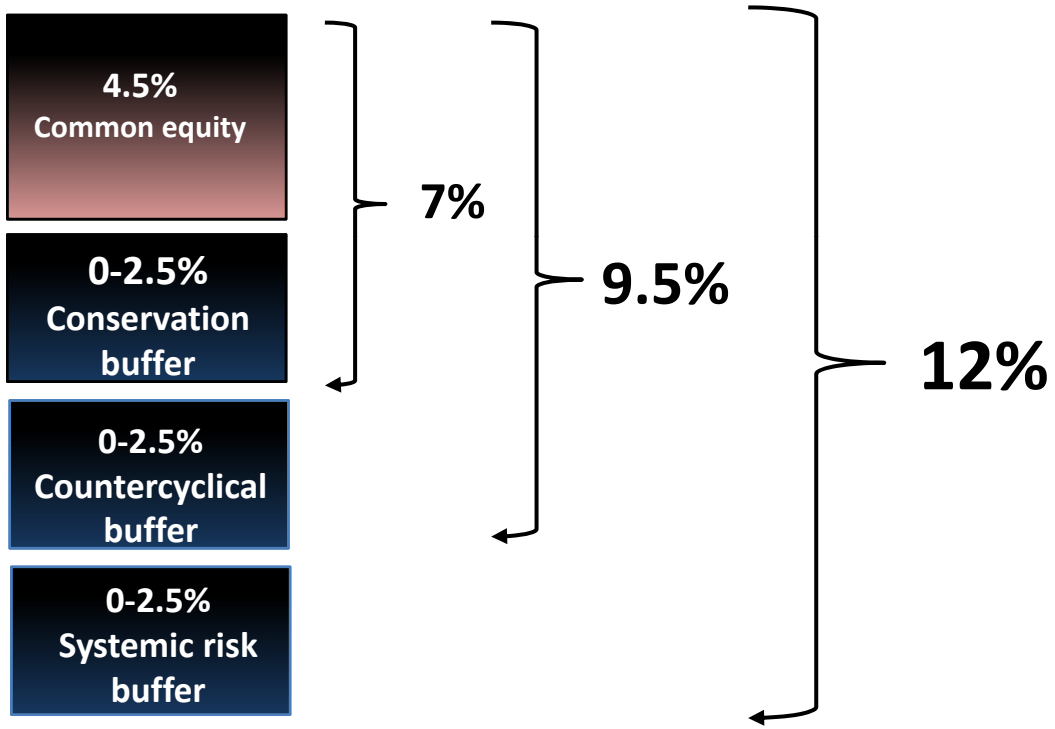
"I will start asking ´How do firms choose their capital structures?´ Again, the answer is, ´We don´t know´."

Myers, Stewart (1984) "The Capital Structure Puzzle" JOF 39 (2)

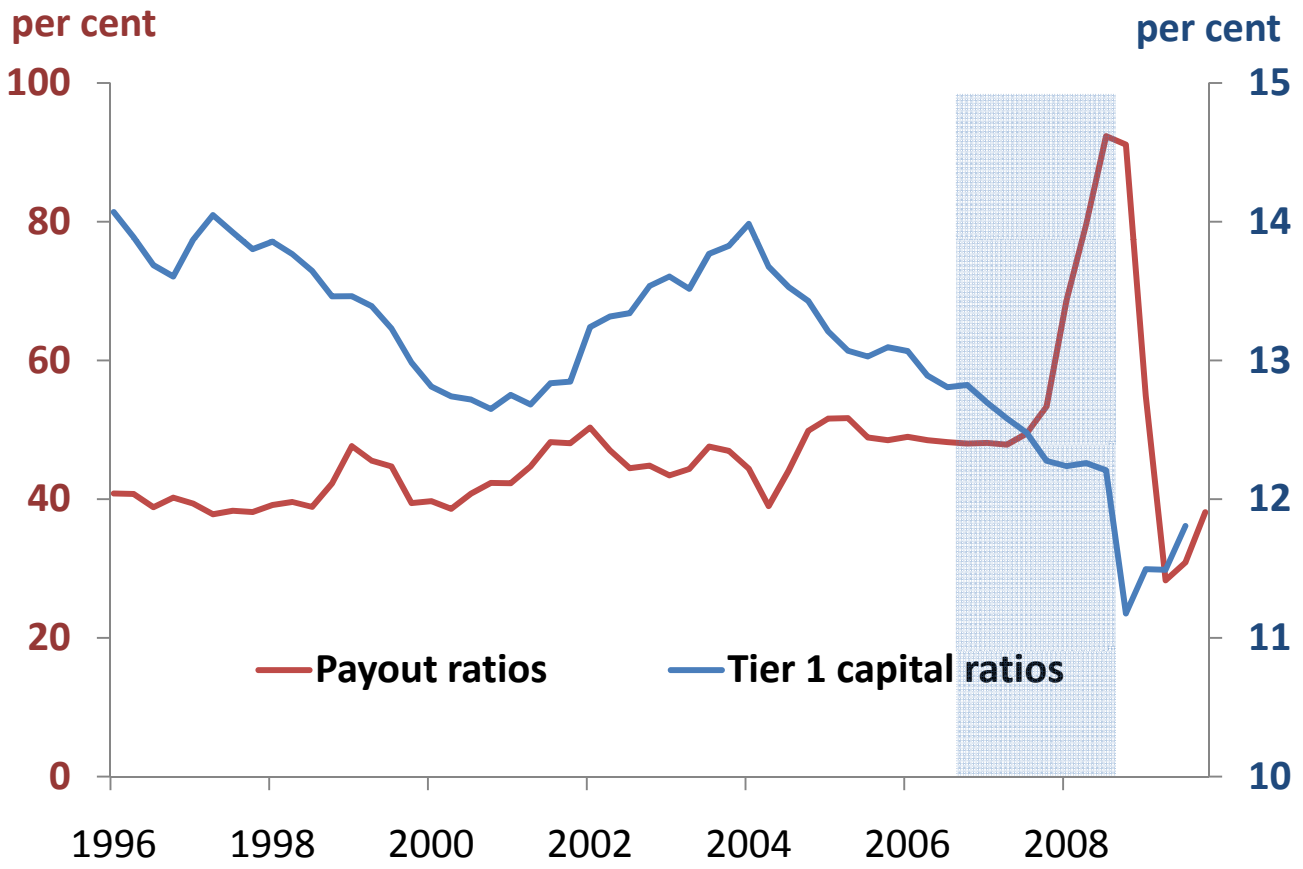
Key points

- Countercyclical buffers can be used (drawn down) during bad times, but not always.
- Under a debt overhang scenario, the **useableness of buffers will depend on the level of capital**.
- Large buffers may not be drawn down as higher capital ratios prevent debt overhang.
- **The optimal rule suggests a large minimum with small countercyclical buffers**, which differs from the Basel consensus.

Basel III: minimum and buffer requirements



Key facts


per cent
per cent
100
80
60
40
20
0
15
14
13
12
11
10
Payout ratios
Tier 1 capital ratios
1996
1998
2000
2002
2004
2006
2008

Key theories

Theories on **debt overhang**:

- Myers (1977)
- Philippon & Schnabl (2009)
- Diamond & He (2010)

Theories on **dividend smoothing**:

- Bhattacharya (1979)
- Miller & Rock (1985)

Theories on **capital buffers**:

- Bernanke and Lown (1991)
- Repullo & Suarez (2009)

Two-period model

Investment

- At the beginning each bank issued **D** of debt and **E** of equity, adding up cash holdings of **L**.
- Assumption 1. Each bank has one investment opportunity, which requires **X** to produce:

either **(1+R) X** with probability **(1-p)**;

or **(1+R) X – W** with probability **p**.

Debt overhang

- Assumption 2. The NPV of investment is positive but debt is risky:

- Underinvestment (i.e. debt overhang) is possible.

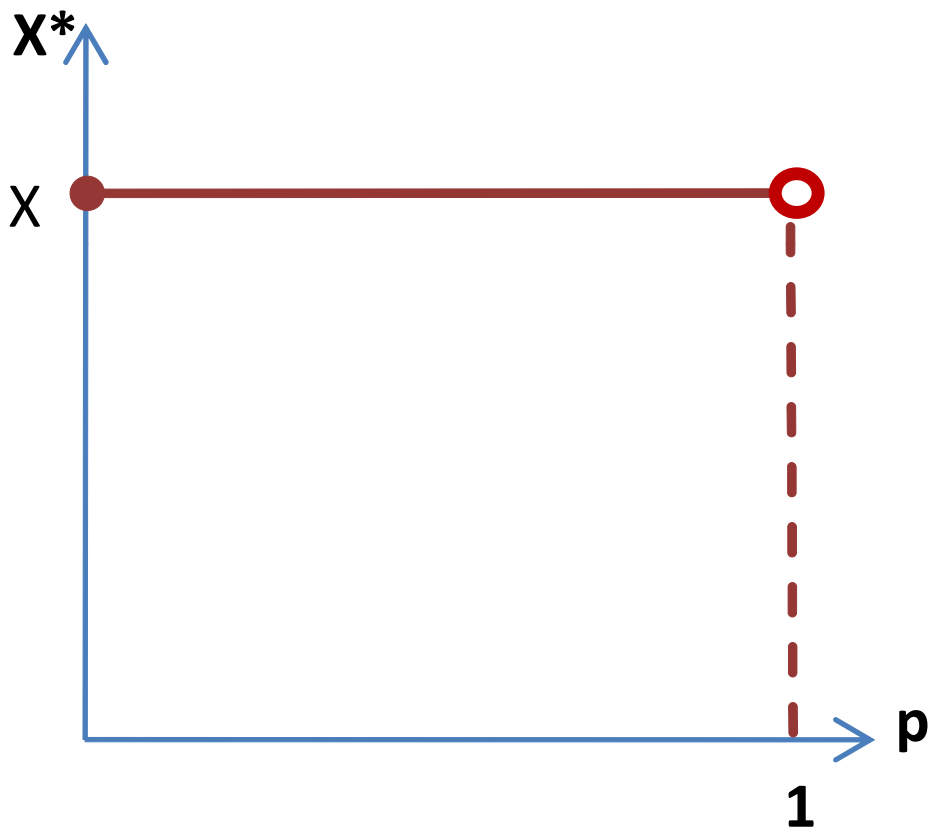
First best : ROA maximisation

- Ignoring capital structures, the maximisation of bank value prevents underinvestment:

$$\textbf{Max } \mathbb{E}\{V \mid X^*\} = \mathbb{E}\{ L + R\,X^* - P\,W(X^*/X) \}$$
$$X^* \in [0,X]$$

- Proposition 1. The solution is $X^* = X$ independently of the probability of P = 1 (or **p**).

First best solution



Second best : ROE maximisation

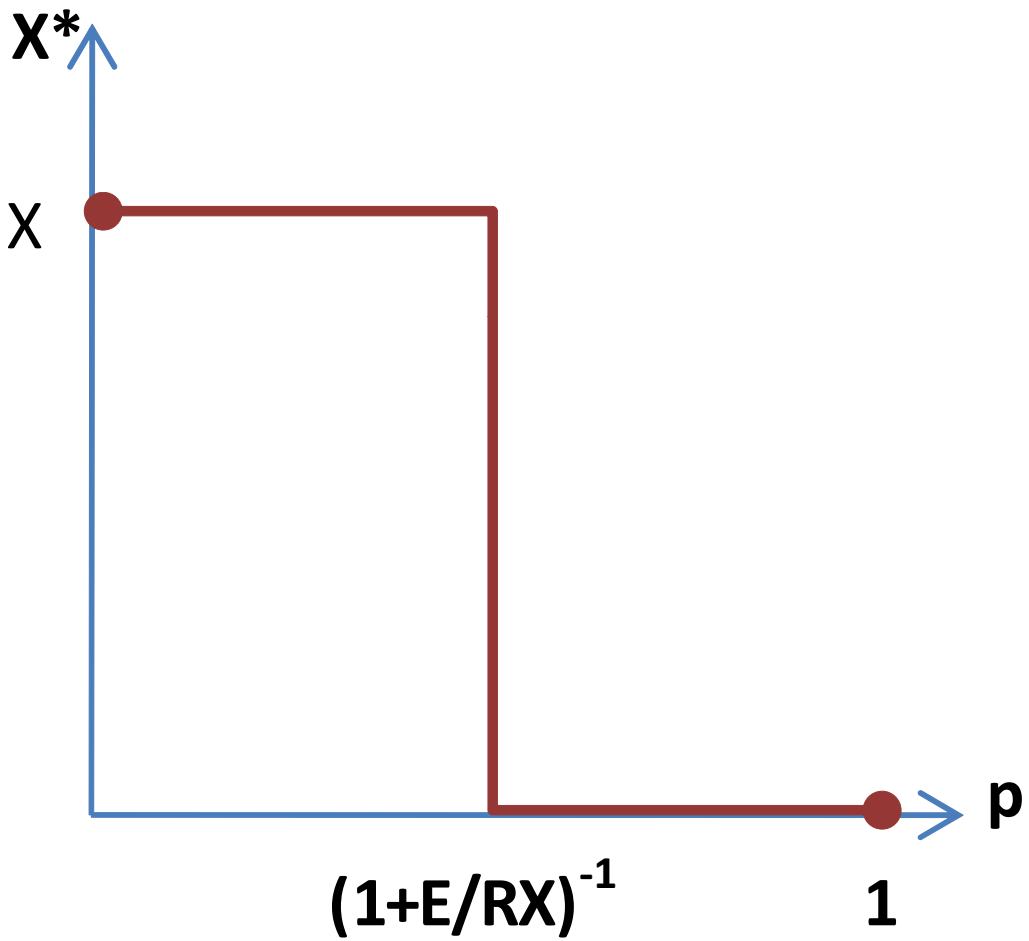
- Considering seniority rules, the maximisation of equity value makes debt overhang possible.

$$\mathbf{Y_E = Max \{ L + R X^* - P W (X^*/ X) - D, 0\}}$$

- Proposition 2. The solution to **Max** $\mathbb{E}$ **{Y_E | X^*}** depends on **p**:

$$\mathbf{X^* = X \ \ if \ p < (1 + E/RX)^{-1}} \text{ ; and}$$
$$\mathbf{X^* = 0} \text{ otherwise.}$$

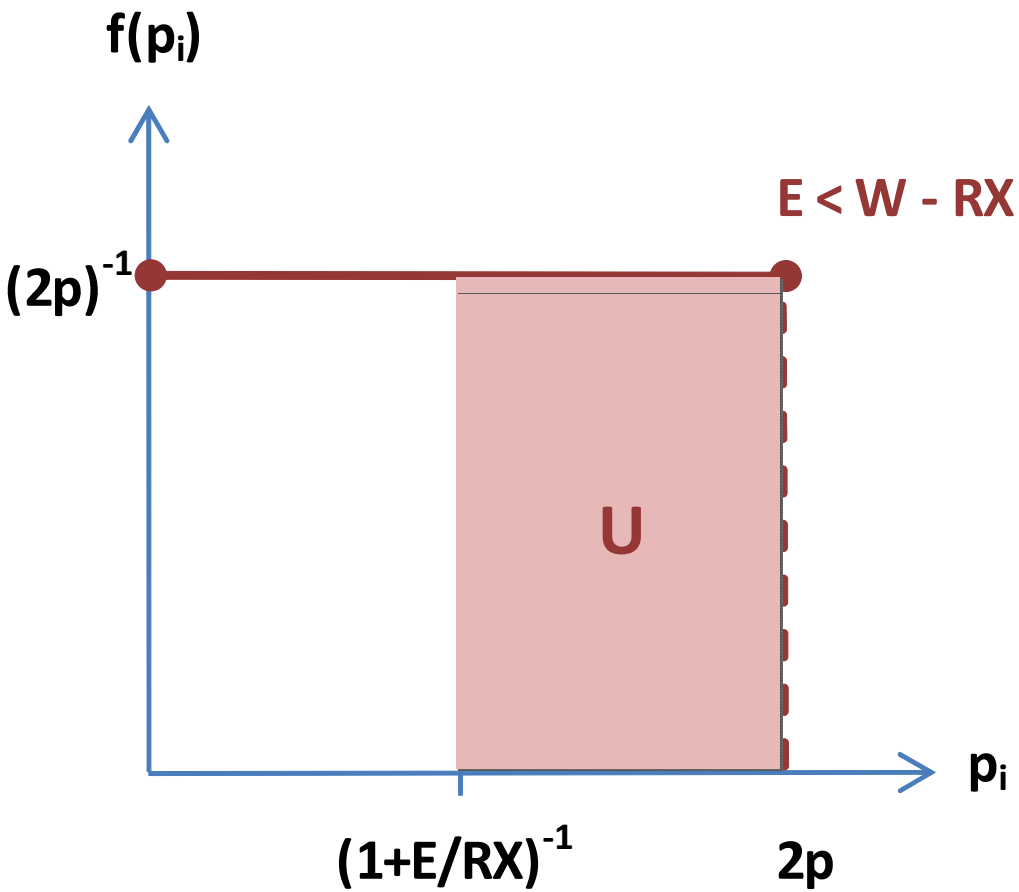
Second best solution



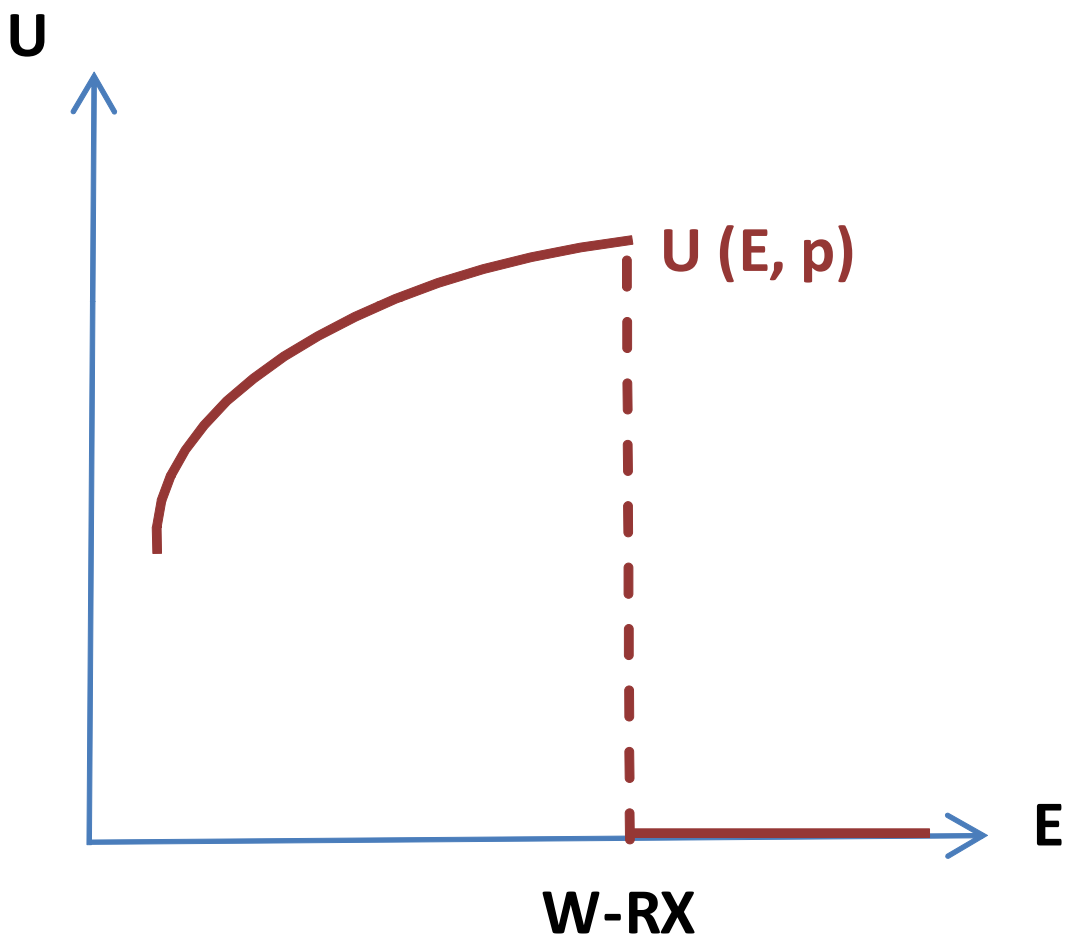
Capital levels under debt overhang

- Assumption 3. Each bank knows its own p_i but the regulator only knows the distribution of p_i.
  - Bank i knows that **Prob { P_i = 1 } = p_i**.
  - Regulator ignores p_i but knows **E { p_i } = p**.
  - With a uniform distribution regulator also knows that **$p_i \in$ [0,2p]**.
- Assumption 4. Full retention prevents debt overhang or simply **RX > 2p w**.

Underinvestment with little equity



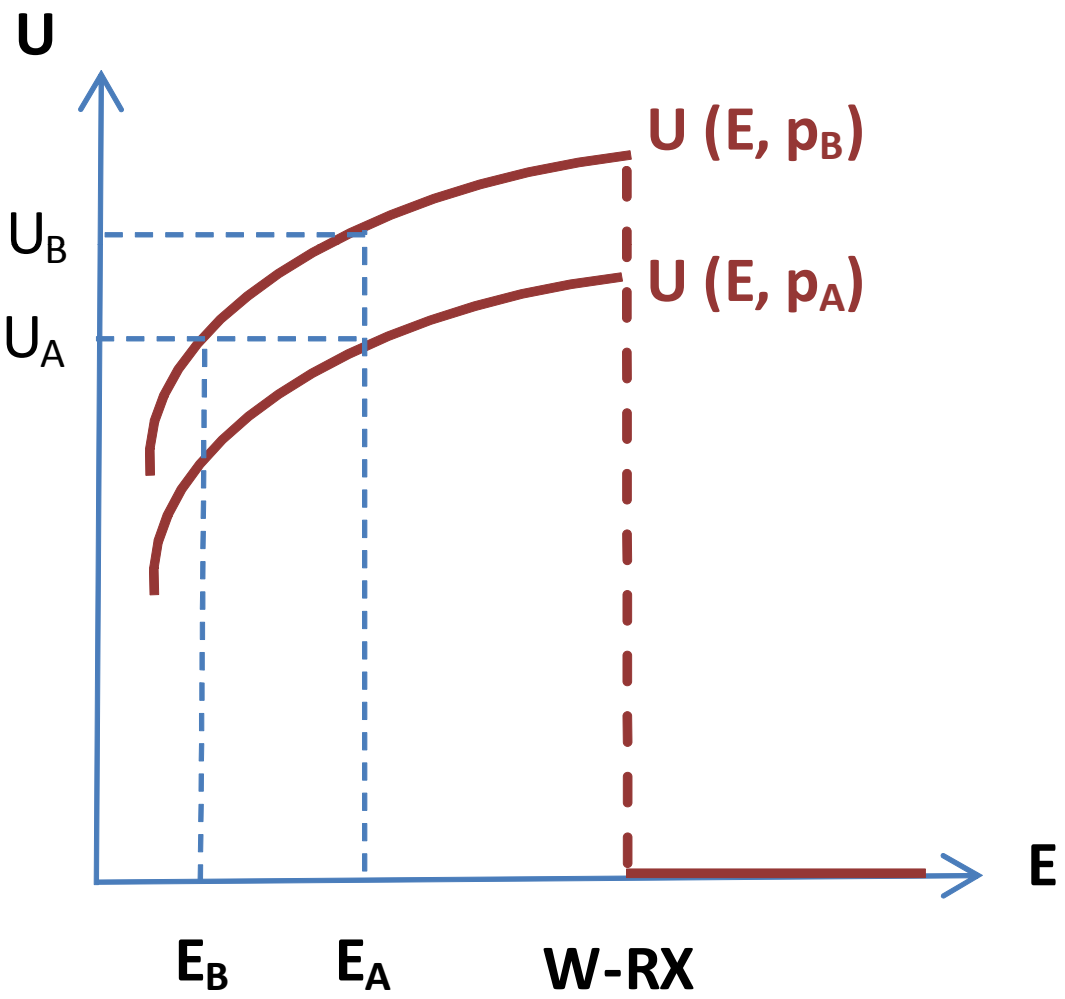
The underinvestment function



Change in riskiness

- Given a (relatively little) level of equity, a higher expected probability of severe write-offs (p) will aggravate underinvestment (U).
- A reduction in the level of equity (E) may keep constant the mass of banks under debt overhang (U).
- This justifies the role of countercyclical capital buffers when capital levels are relatively small.

Comparative statics



Multi-period model

Accounting

Assets	Liabilities
L_0	D
	E_0

More accounting

Assets	Liabilities
L_t	D
	E_t

Dividend policy (Δ)

Assets	Liabilities
$L_t + R X_t^i - P_t^i W - \Delta_t$	D
L_{t+1}	E_{t+1}

First best : ROA maximisation

- Ignoring capital structures, the maximisation of bank value prevents underinvestment:

$$\textbf{Max}\ \mathbb{E}_0\{V_{t+1} \mid X_t^i\} = E_0\left\{\sum_{t=0}^{\infty}\rho^t\left[L_t + RX_t^i - WP_t^i\left(\frac{X_t^i}{X}\right)\right]\right\}$$

$$X_t^i \in [0,X]$$

- Proposition 3. Independently of the probability of $P_t^i = 1$ (or p_t^i), the first best solution is:

$$X_t^i = X$$

Second best : ROE maximisation

- Considering seniority rules, the maximisation of equity value makes debt overhang possible.
- Proposition 4. The solution to **Max** $\mathbb{E}_0$ **{** E_{t+1} **|** X_t^i **}** depends on p_t^i :

$$X_t^i = X \text{ if } p_t^i < (1 + E_t^i / RX)^{-1} \text{ ; and}$$
$$X_t^i = 0 \text{ otherwise.}$$

- But what about dividends (Δ_t^i)?

Second best: the value of equity

- Given the second best solution, at the beginning each bank values:

$$\mathbb{E}_0\{V(E_0)\} = (L_0 - X) + \rho^{-1}(R X - p W) - D$$

Liquidity "surplus" — PV of assets — Debt repayment

- And the price of equity is:

$$P_0^E = \mathbb{E}_0\{V(E_0)/E_0\} = 1 + [(R-\rho) X - p W]\,[\rho E_0]^{-1}$$

Consequence of liquidity "surplus"

Second best: dividend policy

- Option 1 (dividend smoothing):

$$\Delta_t^i = (R - \rho)\, X - p_t^i\, W$$

- Option 2 ("bird in the hand"):

$$\Delta_t^+ = (R - \rho)\, X \quad \text{or} \quad \Delta_t^- = (R - \rho)\, X - W$$

with probability $1-p_t^i$ with probability p_t^i

- With a low hard minimum and no buffer, dividend policy is irrelevant.

Useableness of buffers

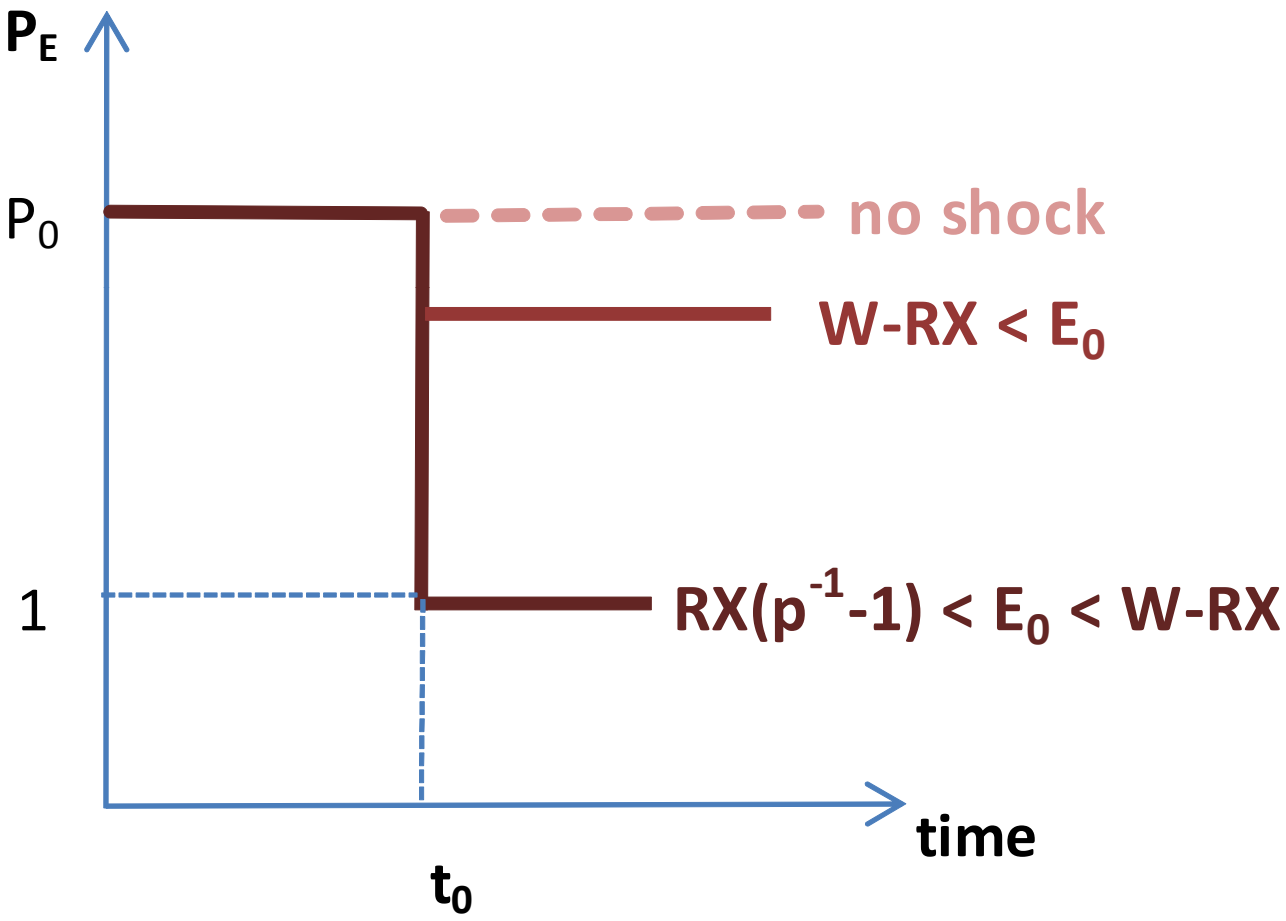
- A severe credit risk shock deactivates the buffer requirement but it does not mean they will be used.
- Buffers will be used if banks release dividends to mitigate or prevent debt overhang:

$$\Delta P_t^E = \{ L - D - RX [(p')^{-1} - 1] \} - \rho^{-1} [(p' - p) W]$$

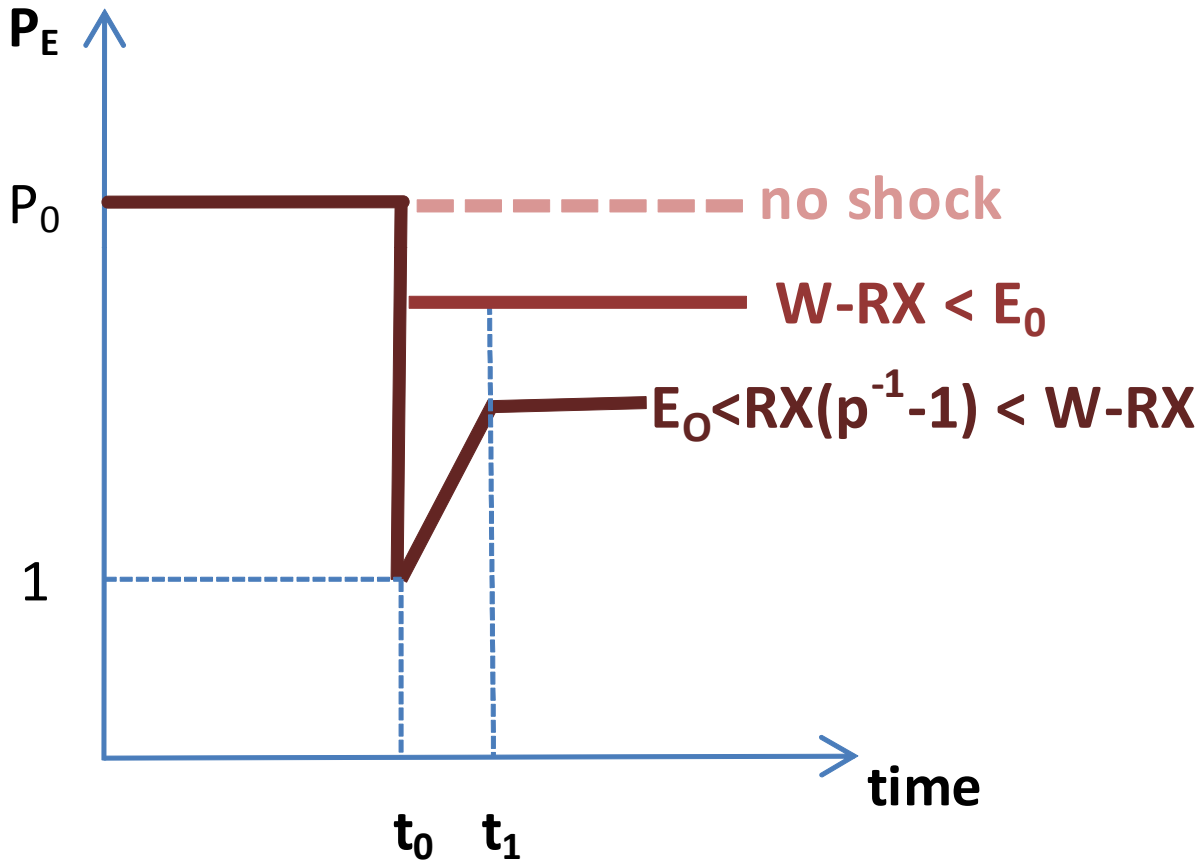
release of dividends — larger expected losses

- **The use of buffers (i.e. the release of dividends) will depend on the level of capital**:
  - only small buffers would be used under stressed situations
  - large buffers may not be drawn down

Credit risk shocks with hard minima



Credit risk shocks with countercyclical buffers



Conclusions

- Under a debt overhang scenario, **useableness of buffers will depend on the level of capital**.
- A large minimum can prevent debt overhang and banks may choose to maintain higher levels of capital (i.e. buffers will not be used)
- **The optimal rule combines a large minimum with small buffers.**

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