

Anti-cyclical Capital Adequacy

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Procyclicality

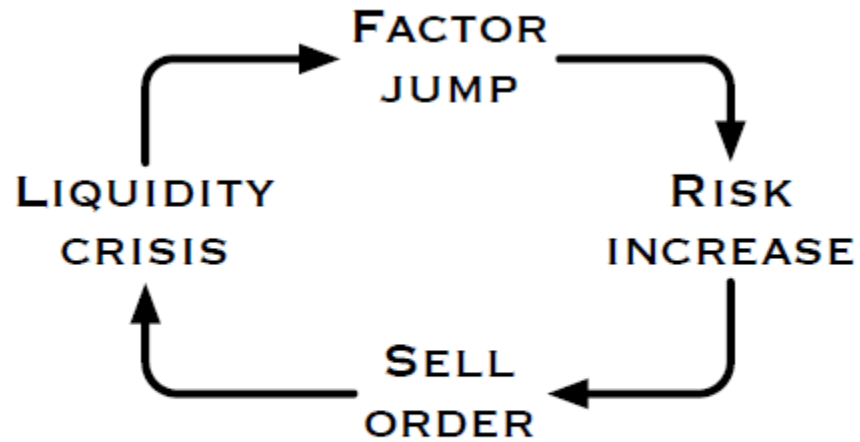


FIGURE 1: A cycle caused by a *reactive* risk measure.



Myopic Risk Estimation

> Probability distribution using recent past

- Asset Value = Discounted Expectation of future Cash Flows
- Derivatives depend on Volatility Estimates
- Credit spreads depend on Solvability and Asset value estimates

> Procyclicality

- Regulatory procyclicality:

Drop in asset value \Rightarrow Increased put price \Rightarrow Increased volatility \Rightarrow Increased VaR \Rightarrow Sell-off \Rightarrow Drop in asset value...

- Minsky Instability Hypothesis

Drop in asset value \Rightarrow Downgrading \Rightarrow Increased interest rates \Rightarrow Increased debt burden \Rightarrow Solvability at stake \Rightarrow Downgrading \Rightarrow Drop in asset value...



Market Discipline



Financial Times 1998



Basel II Capital Adequacy

> Capital = $k \times \text{VaR}$

- VaR is computed by the institution

> Back-test

- Count exceptions, regardless of size: k depends on results
- Verify “independence” of violations

⇒ No incentive to anticipate crises, violations occur simultaneously

> “Full control” tendency

- Send all your positions
- We compute risk for you

⇒ Unaccountability



Anticipative Capital Adequacy

> Risk is the product of 2 figures:

$$\text{Risk} = \text{Risk factor shift} \times \text{Sensitivity to risk factor}$$

> Separation of roles

- Institution ought to know its sensitivity
- Regulator should have a view on factor shifts

> Anticipate bubbles

- Institutions report their real sensitivities to various factors
- Regulator can see over-exposed sectors and anticipate bubbles
- Regulator specifies higher factor shifts
- Higher capital requirement deflates bubble



Anticipative Capital Adequacy

> Regulator issues a list of Stress Scenarios

- For each factor: a whole curve of scenarios

Index	Stress++	Stress+	Stress0	Stress-	Stress--
S&P500	+20%	+10%	0%	-10%	-20%
TB Yield 10Y	+200bp	+100bp	0bp	-100bp	-200bp
BAA Credit Spread	+500bp	+200bp	-10bp	-100bp	-200bp
...					

> Institutions compute corresponding Stress Tests

> Capital Adequacy = $k \times$ Worst Stress Test i.e. “Stress VaR”

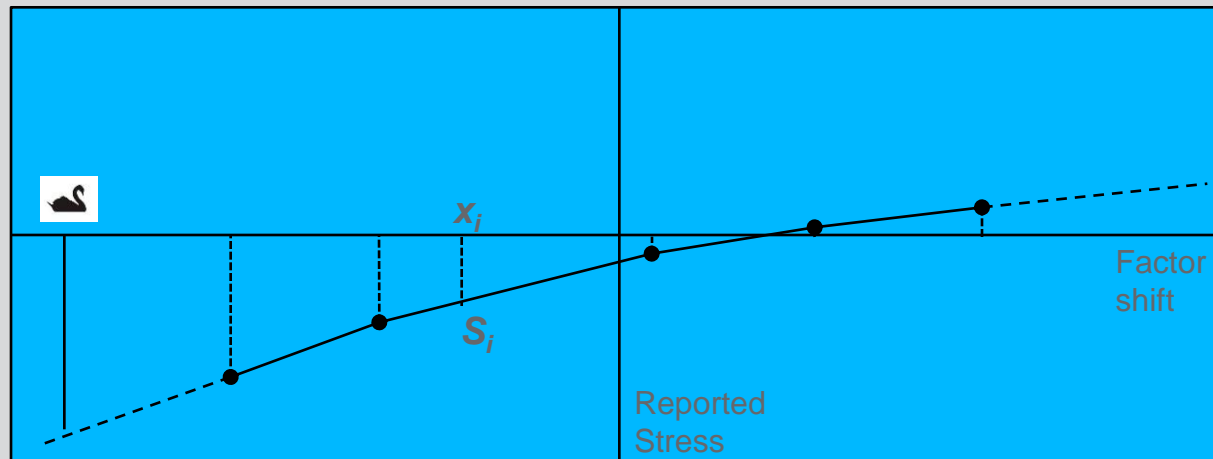
> $k = 1$ unless penalized



Anticipative Capital Adequacy

> Back-test control of reporting quality

- Regulator cannot check each individual reported stress test
- Principle: each loss should be explained by at least one “stress curve”
- Actual factor F_i shift = $x_i \Rightarrow$ Inter-/extrapolated stress test S_i
- If Loss > $\max(|S_i|)$ then penalized $k = \text{Previous } k \times \text{Violation ratio}$
 - > Dampening mechanism back to 1 when no violation





Anticipative Capital Adequacy

> Implementation

- Institutions can use additional factors not considered by the regulator if they are exposed to. In this case, they define their own scenarios.
- Stress test computation should account for “extreme correlations” to fully represent the impact of a given factor shift
- Possibility to split institution into parts and add stress tests of the various “divisions”

> Possibility to include extra margin for unaccounted risks

- Operational: can be a specific “division”
- Counterparty: report netted portfolio with a given counterparty in the same way
- Liquidity: include slippage in non-linear stress function
- Default: account for market impact of possible defaults



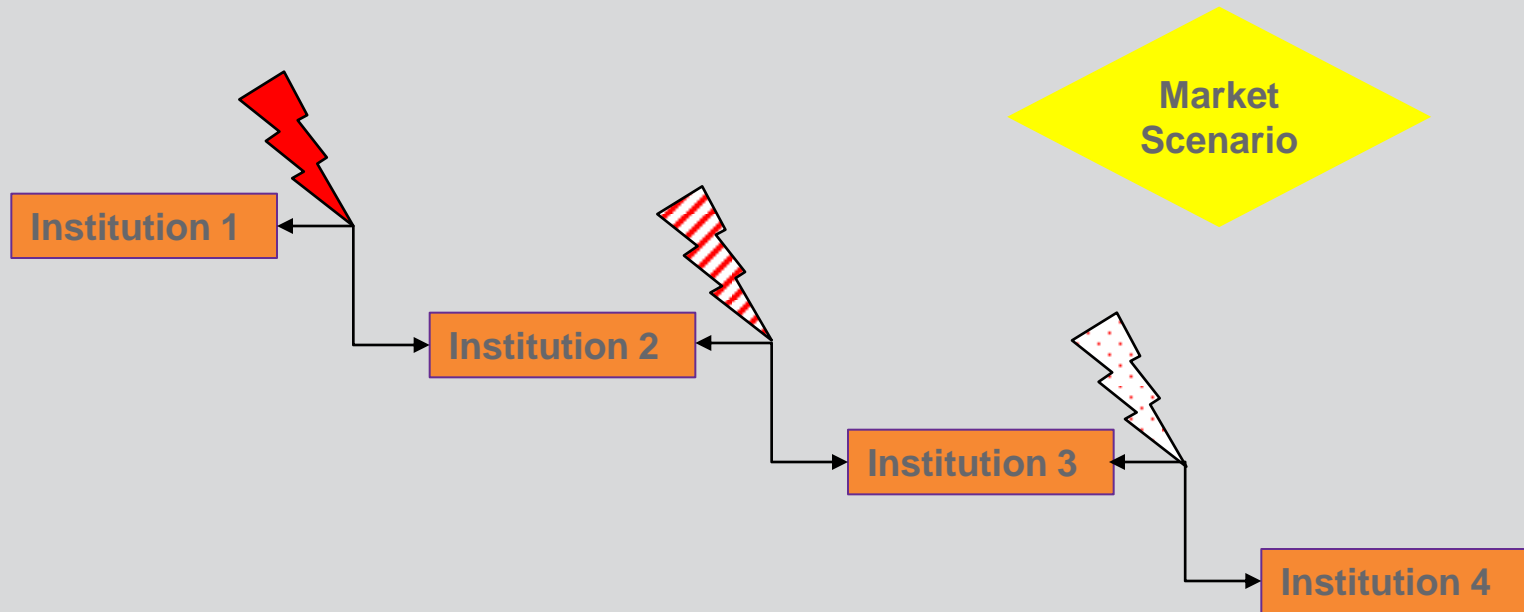
Eliminating Pro-cyclicality

- > Regulator decides for the stresses to apply, hence is in a position to smoothly impose deleveraging before it becomes an unsolvable problem. This is why the regulator must have an anticipative measure of factor risks and, in particular, of systemic risk.
- > Risk reporting is not a figure, but a *function* of markets hence violations are not due to markets swings but to misreporting of extreme risks. If institutions correctly report their extreme exposures, there is no reason why they would more violate their assessment during a crisis than during normal periods.
- > Reasons for failure of this proposition
 - The Regulator fails to anticipate systemic risks
 - Institutions fail to correctly estimate their exposures to extreme market conditions



Contagion

- > With sensitivity info, Regulator can simulate the impact across the industry of a given stress scenario





A new economic lever

> Current Monetary Policy

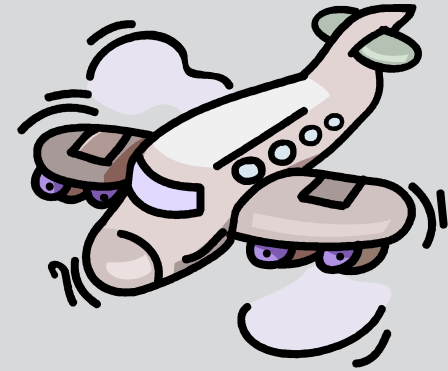
- Money printing
- Banks credit lines
- Lending and repo rates

> No longer works

- Maximum Quantitative Easing
- Interest rates = 0

> With proposed Capital Adequacy

- Balance cost of investing in various segments
- Smoothly deflate appearing bubbles
- Create incentives to orient capital towards where needed: innovation...





Know your risk...

