

Risk Management and Internal Governance in Banks

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Agenda

I. “Pre-crisis” approach to bank governance

- Incentives and the role of regulation
- Current regulatory approach: Basel II / Internal governance framework

II. Lessons from the crisis

- Enhancing risk measurement and management / Improving market discipline

Incentives and the role of regulation:

1. Conflict of interest between equity- and debt-holders
2. Incentives for risk management
3. Role of regulation
4. Public safety nets

1. Conflict of interest between equity and debt holders

- Equity-holders may actually prefer to increase risk (higher asset risk or increased leverage) to increase the market value of their shares.
- At sufficiently low levels of capital, equity-holders have an incentive to gamble, because they have limited liability and are the residual claimants of the bank.
- The conflict is present at all levels of capital, but its impact is smaller at high capital levels where the benefits of increasing risk may be dominated by the benefits of reducing risk (reducing financial distress costs).
 - Effective risk management reduces the present value of financial distress costs.

2. Incentives for risk management

- Managers can be risk-averse and wary of the potential impact of bank's losses on their job security, compensation and reputation.
- Therefore managers and traders are often given implicit or explicit contractual incentives to take risks.
- Finding a balance between incentives for risk taking and effective risk management is delicate (a principal-agent problem).
 - The costs of retaining managers and keeping their incentives aligned with equity-holders are increasing in the level of risk.
- Replacing capital is one of the important costs of financial distress, which can be traded-off through risk management.
 - Higher levels of capital lead to higher agency costs (managerial inefficiencies etc.)

3. Role of regulation

- Regulation of minimum capital levels:
 - Conflict of interest between equity-holders and creditors (depositors) of a bank:
 - Well-formulated, risk-based capital requirements can inhibit socially inefficient gambles.
 - External capital tends to be more costly than retained earnings.
 - Financial distress in banks typically has negative spill-over effects for the remainder of the financial system (systemic risk – contagion) and for the implicit or explicit financial guarantees provided by taxpayers.
 - Reduction in the moral hazard caused by deposit insurance and “too-big-to-fail”-status.
- Banks typically operate at a high level of leverage:
 - An incremental capital unit can expand the scale of the bank significantly. But, a small reduction in capital can demand a significant reduction in assets.

3. Role of regulation

- In principle, the level of capital is determined by the volatility of earnings and assets.
 - Capital raised up to a selected confidence level regarding the “avoidance of bank default” . (Cf. Basel II).
 - The primary role of capital is to act as buffer against total financial risks (and bank default) and not as a form of funding the assets.
- Also needed: Regulatory standards for risk management, organisation of internal controls and incentive structures:
 - Incentives for effective risk management may be distorted (principal-agent problems): unduly high risk taking can be rewarded!
 - The incentives can be “wrong” also due to and failure to incorporate the costs of financial distress and systemic risks.

4. Public safety nets

- Theoretical literature: The public safety net, providing assistance to banks in distress and protecting banks' claim-holders from losses, increases the propensity by bank managers to take on excessive risk (moral hazard).
 - Insured claim-holders do not have appropriate incentives to monitor the actions by banks' management.
 - The bank manager will rationally maximize bank value taking the subsidy element of deposit insurance into account, resulting in higher risk taking.
- Empirical evidence (Gropp-Vesala):
 - Explicit, limited deposit insurance may be better than implicit, unlimited guarantees for banks.

Current regulatory approach:

1. Objectives of Basel II
2. Main elements of Basel II
3. Basel II modeling (VaR) approach
4. Internal governance framework

1. Objectives of Basel II

- Move to significantly more risk-sensitive capital requirements that are conceptually sound.
 - Basel I was very crude: It differentiated capital requirements against various credit risks only across broad segments of assets (e.g. all corporate credits had a 100% risk-weight, mortgages 50%).
 - Basel I gave less incentives to hold high-quality corporate credits and mortgages and spurred securitisation.
 - Greater use of assessments of risk provided by banks' internal systems as inputs to capital calculations (regulation close to economic capital needs).
 - Each asset in a bank's portfolio should have its own risk-adjusted return requirement.
- Promote the adoption of stronger risk management practices by the banking industry.

2. Main elements of Basel II

- The First Pillar: Calculation of minimum capital requirements
 - Credit risk
 - Standardised Approach
 - Internal Ratings Based Approach
 - Securitisation Framework
 - Credit risk mitigation
 - Market risk
 - Operational risk
- The Second Pillar: Supervisory Review Process
 - Risks not covered by Pillar 1
 - Capital add-ons
- The Third Pillar: Market Discipline
 - Role of non-depositor debt-holders and equity-holders in disciplining banks
 - Information provided to sophisticated investors and market analysts

3. Basel II modeling (VaR) approach

- Principles:
 - Banks should recognise and measure all their risks and reserve sufficient amount of capital to cover those risks.
 - Regulation and capital requirements rely heavily on banks' internal statistical models:
 - Pillar I: credit (IRB), market (Market VaR) and operational risk (AMA)
 - Pillar II: All risks not covered in pillar I
 - Supervisors should review and challenge banks' risk models: A great challenge for supervisors.
 - Supervisor will seek to ensure that banks' systems and controls are adequate to serve as the basis for the capital calculations.

3. Basel II modeling (VaR) approach

- Risk-weighted asset amount (K) for an individual exposure:
 $12.5 * K * EAD$
 - Simplification: $K = (P(X=x) * LGD - PD * LGD) * M$.
 - PD = (unconditional) probability of default,
 - LGD = loss given default,
 - EAD = exposure at default,
 - M = effective maturity,
 - $P(X=x)$ = the conditional default probability of an individual obligor.
- Risk-weight functions produce capital requirements for the Unexpected Loss (UL) portion of the loss distribution.
 - Expected losses are treated separately.
 - The share of EL not covered by eligible provisions is deducted from capital.

3. Basel II modeling (VaR) approach

- Key assumptions:
 - **A fully (internationally) diversified credit portfolio.**
 - For a given realisation of the systematic risk factor driving credit risk: $X=x$, the portfolio loss in a diversified portfolio is the sum of individual losses: $\Sigma(\text{LGD} \cdot \text{EAD}) \cdot P(X=x)$, because the idiosyncratic risk factors cancel out.
 - A realisation of X corresponding to a percentile of the probability distribution of X , yields a VaR measure of the highest possible portfolio loss with this chosen probability.
 - Some correlation-effects with the systemic factor included in the model (smaller correlation in high-PD obligors).
 - **X follows std. normal distribution (N).**
 - **Confidence level chosen is 99.9% ($x=3.09$).**
- If a bank holds exactly the minimum required amount of $K \cdot \text{EAD}$ of capital, the capital ratio is 8% (the minimum required).
 - Would correspond to economic capital held at 99,9% confidence level, but portfolio effects (diversification) are assumed very crudely in the model.
- Such a VaR approach can also be applied to credit and market risks.
- Advanced measurement techniques also available for operational risk, but still in need of strong further development.

4. Internal governance framework

- Independent risk control functions (independent of business decision-making):
 - Reporting to top management and Board of Directors.
 - Validation and development of risk management models and systems.
 - Monitoring of compliance with internal limits and procedures.
- Independent regulatory compliance and internal audit functions
- Operational risk controls:
 - IT systems
 - Clear lines of responsibility and authority
 - Adequate checks and balances
 - “Four-eyes”-principle
 - Compulsory holidays
- Remuneration and other incentive schemes
- External audit
 - Asset valuation issues etc.

Enhancing risk measurement and management

1. General lessons from the crisis
 2. Risk measurement issues
 3. Economic capital approach
 4. Risk management issues
5. Regulation of internal governance
6. Revisions to risk-based capital adequacy rules
7. Possible ways to improve market discipline

1. General lessons from the crisis

- The crisis has necessitated a fundamental assessment of the governance – regulatory framework of financial institutions.
 - A piecemeal response to the problems highlighted by the crisis would be “fighting the last war” .
- There have been failures in all three forms of governance, which has deepened the current crisis:
 - market discipline;
 - corporate governance;
 - regulation and supervision framework.

1. General lessons from the crisis

- Rapid growth in securitization and in unregulated structured credit derivatives (CDO, CDO²...) has amplified the present crisis.
- Increased complexity of financial instruments has led to major difficulties in risk measurement and pricing.
- Increased leverage and regulatory arbitrage through e.g. synthetic CDOs.
 - Rapid growth of on- and off-balance sheet exposures of banks and other institutions.
 - Originators' remaining linkages to the underlying risks (CLO) not well understood.
- Problem not in innovation (securitization and structuring) as such, but:
 - Lack of understanding the sensitivity to systematic factor(s) (house prices) passing through the variety of financial structures.
 - Destabilizing deleveraging after the crisis outburst.

2. Risk measurement issues

- Things to remember:
 - All risk models sweep dirt under the rug and are thus crude approximations of reality
 - Models are always wrong: The most important question regarding any financial model is how wrong it is likely to be, and how useful it is despite its deficiencies?
 - Need to challenge the model assumptions and results and use common sense.
 - **Despite all this, models are extremely useful in analysing and understanding a wide variety of complex financial problems!**

2. Risk measurement issues

- Usual drawbacks of current “best practice” risk models (and Basel II approach):
 - Unrealistic distributional assumptions (normality),
 - Blind reliance on *recent past events* in forecasting future risks (historical simulation),
 - Underestimation of “tail event” risks,
 - Reliance on efficient market hypothesis (exogeneity of risk factors),
 - False comfort about models’ accuracy,
 - Use of unsound (non-convex) risk measures (VaR),
 - Unsound principles for aggregation of risks over risk types (e.g. credit and market risk).

2. Risk measurement issues

- Enhancements in risk modelling:
 - More realistic model assumptions and calculation methodologies (fat tailed distributions, simulation methods).
 - Allowance for market imperfections (market liquidity, recognition of endogeneity of risks, transaction costs).
 - Use of sound (convex) risk measures (e.g. CVaR).
 - Use of stress testing to complement and challenge model results.
 - Unified framework for measuring banks' balance sheet risks (ALM).
- **Great challenges for financial institutions and risk managers and supervisors!**

3. Economic capital approach

- Banks' economic capital (EC) models aim at:
 - Improving the management of balance sheet risks.
 - Asset & liability management strives to quantify all the risks affecting the assets and liabilities of an institution in an integrated framework.
- Development of EC methodologies are still in their infancy.
- Successful EC modeling requires:
 - Identification of the uncertainties driving the risks of an institution.
 - Quantification of market -, credit -, business - and other risks in a unified framework.
 - Comparable risk measurement principles across risk types: definition of risk measure, time horizon, confidence level, etc.
 - Description of cash flows and market values of assets and liabilities as a function of the underlying uncertainties.
 - Risk-based measurement of unit performance.
- Basel II stops short of allowing the results of such credit risk and economic capital models to be used for regulatory capital purposes.
- In principle, further movements along that continuum are foreseeable within Pillar 2 (treatment of diversification).
- **Although fully fledged EC models are still practically non-existent, banks are continuously developing their modeling methodologies and understanding of bankwide risks.**

4. Risk management issues

- Increased role for risk management in the decision making bodies.
 - Sufficient and proficient resources for risk management and control with attractive remuneration.
 - Improving the reporting and understanding of banks' balance sheet risks at the top management level.
 - Role of stress testing in decision making: stressing the model assumptions and operating environment.
 - Recognition of risks and potential exposures caused by interlinkages between financial institutions.
 - Less complexity facilitates risk monitoring.
 - Regulated markets for actively traded derivative products.
- **Disasters will always emerge, but sound risk management can alleviate the severeness of the effects of crisis in complex and connected systems (with humans).**

5. Regulation of internal governance

- A matter for regulators as well:
 - Clear failures in e.g. top management oversight of risks, incentive pay-schemes, risk modeling and model validation.
- Regulation and supervision of the main principles of sound governance:
 - Avoid detailed regulation and interference with the management role.
 - Enforce effectively the Basel II / Pillar 2 requirement to identify and manage all material risks.
 - Demand independent reporting and model validation
 - Sound remuneration policies:
 - Reward long-term performance,
 - Adopt risk-based measures of performance,
 - Claw-back clauses to remuneration,
 - Transparency of policies,
 - High-enough stature and pay of “non-profit -making” personnel.

6. Revisions to risk-based capital adequacy rules

- Risk-adjusted requirements (Basel II) can reduce the risk of insolvency to a selected confidence level.
- But, demand accurate risk measurement and may not prevent high leverage:
 - E.g. residual risks in risk transfers would have to be covered appropriately – otherwise an increase in leverage.
 - An incremental capital unit can be used to greatly expand assets judged by internal models to be of low risk.
- While keeping risk-sensitive capital regulation, a critical review of the Basel II requirements is needed:
 - Higher charges for mortgage-related assets, credit lines and residual risks.
 - Banks should reserve enough capital during “good” times.
 - Conservative modeling assumptions can reduce the procyclicality effects
 - Simple ratios (leverage ratio) are useful complementary indicators in monitoring the risks of the banking sector.

7. Possible ways to improve market discipline

- Complexity and interconnectivity of institutions' risk positions (due to OTC contracting) create problems for transparency.
- Further disclosure requirements could help (if driven by investor needs).
- Need greater incentives to investors to monitor and influence management by restricting the public sector safety-net.
 - Need to leave (junior) creditors credibly out of the safety-net:
 - Credible deposit insurance.
 - Pre-agreed rules to deal with failing banks.
 - Avoid "blanket guarantees" in favour of all creditors!
 - Incentives to influence are reduced by the difficulty of reaching private sector solutions in case of major institutions.
- Market discipline could and should be enhanced as complement of official supervision.
 - Supervisors could usefully monitor also market signals (especially equity-based).