

3rd Financial Risks International Forum

Risk Dependencies

Session 12: Capital requirements

Capital requirements and tax payer put option values for US banks
by Ernst Eberlein & Dilip Madan

Basel II and the Value of Bank Differentiation
by Eberhard Feess & Ulrich Hege

Discussion by Henri Pagès
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- Both papers provide novel insights into the risk-sensitive regulation framework (Basel II)
 - E & M extend the calibration of required capital to the case of unbounded liabilities (credit risk transfers), using balance sheet data from five major investment banks
 - F & H show the benefits of the menu approach to Basel II for the determination of capital requirements (SA vs IRB) in terms of risk differentiation in the banking system
- Both cater to the intellectual foundation of capital as buffer against insolvency (to promote safety and soundness of banks) rather than incentive device against excessive risk taking or stopgap measure providing room for supervisory intervention
- Key novelties of the papers:
 - Joint modeling of correlated assets & liabilities when deposit insurance fund is not judgement-proof (unlimited liability)
 - Endogenous determination of lending and risk-taking with welfare-maximizing regulator operating under menu approach

Comments on first paper (1)

Tax payer put option value

- In Merton's model of equity, value of equity is

$$J = E \left[e^{-rT} (V(T) - F)^+ \right],$$

where F is face value of debt and $V(t)$ the unlevered value of the firm (bank)

- When $V(t) = A(t) + M(t) - L(t)$, unbounded liabilities $L(t)$ imply that unlevered value of the bank can grow arbitrarily negative: The “general economy” absorbs all losses V^- , increasing bank's value to equity holders
- Paper estimates buffer M consistent with holding equityholders' (tax payer) put option value in check: Required reserves relative to actual reserves
- Possible caveats of the approach
 - Endogenous default, capital structure choice
 - Dynamics of capital regulation and practical implications

Comments on first paper (2)

Endogenous default and capital regulation

- Values of assets $A(t)$ and liabilities $L(t)$ are driven by cash payouts that flow in and out of the bank: Which cashflows are consistent with the specification adopted (Lévy processes)?
- At maturity, “general economy” absorbs losses if and only if $V(T) < 0$: Bank has implicitly no access to equity capital (costly recapitalizations)
- More generally, capital structure adjustments could affect banks’ distance to default and should be evaluated
- Capital requirement is not cast in same terms as in actual regulation: Interpretation of γ in terms of VAR threshold
- Goodhart’s repeated liquidity conundrum: Banks should hold more than capital required

Comments on second paper (1)

Banks' specific skills and moral hazard

- Bank monitoring increases the collateral value of uncorrelated projects (from $R/2$ to kR) but has no effect on correlated projects
- Solvency regulation has no effect of banks' incentives to monitor (uncorrelated) projects: no moral hazard in the provision of effort
- Moral hazard in project choice: banks choose how to invest funds between projects with different characteristics
- Risk-return frontier of risky projects
 - Model: Correlated assets have lower expected returns than uncorrelated projects (both for entrepreneurs and their financiers)
 - Real world: Correlation brought about by innovative investments (derivatives, bridge loans for M&A, proprietary equity trading, hedge fund financing, off balance sheet finance vehicles, ...) may be associated with higher expected payoffs (despite agency problems)

Comments on second paper (2)

Regulation and moral hazard in project choice

- Efficiency of capital requirements: By constraining banks' profits, regulation induces banks to substitute safe uncorrelated projects for risky correlated ones (to the extent that they can do so), since safe projects have the highest payoffs (*cherry picking*)
- IRB-contingent approach: Subordinating capital requirements on ability to screen risks allows regulator to confine risk in small segment of banking sector, increasing social welfare (through lower aggregate risk of failure): systemically important banks are small
- Possible limits of the two-layer approach:
 - Effort moral hazard: Lowering risk-based capital requirements of IRB banks ($b_S = 0$) may reduce incentives to monitor, hence banks' ability to create more collateral (\neq misreporting problem)
 - Moral hazard in project choice: Two-layer approach may fail to reach the optimal allocation if risky correlated projects have higher returns (*risk shifting*); cf. Freixas-Parigi (2008)

Comments on second paper (3)

Regulation and social welfare

- In the model, regulation is justified through the reduced-form imputation of a social cost to bank failures
- Requiring banks to hold more capital reduces social cost of bank failure, but may lower social welfare for at least two reasons
 - Without threat of liquidation, safer banks are less able to commit their specific skills on behalf of outside investors, so a rent typically goes to the banker (Diamond & Rajan, 2000)
 - Under perfect competition, banks transfer higher funding costs to the borrowers in the form of higher loan rates, which reduces total lending
- In contrast, the model assumes $R = 2$ irrespective of the severity of regulation: Competition from unskilled non-banks allows banks to extract high rents in equilibrium, and this obviates the need to raise interest rates

Comments on second paper (4)

Regulation and credit rationing

- In the model, credit rationing may arise in equilibrium when the cost of bank failure is sufficiently high
- However, correlated and uncorrelated projects have positive NPV and should be undertaken whether or not banks are financially constrained
- Projects can still be funded with *risky debt*:
 - Non-banks can provide the funding since both projects break even with $R = 2$
 - Regulated banks can also provide the funding, selling all necessary loans to bankruptcy-remote trust through securitization, while retaining “servicing rights to exposures:” As long as they comply with operational requirements, banks may exclude all loans from risk-based capital calculations under Basel II.

- In both cases, punchline seems to be that suitable adjustments in model parameters of Basel II could improve the trade-off between long-run stability and credit rationing
- Using these models as a platform for the assessment of regulatory reforms is warranted *conditional* on keeping Basel II in the first place, and maintaining assumptions/regulations as modelled
- Unconditionally, one would also like to have a broad view of which market failures are important and which regulations are needed to address them