Observations on the Financial Crisis: Implications for Asset Management, Risk Management , and Regulatory Reform

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Institutional Money Congress 2009
Frankfurt

February 26, 2009

My Remarks are Divided into 3 Parts

- Structural elements of a financial crisis: How does risk propagate so rapidly across the system? Is there a structural relation between financial innovation and the risk of crisis? What are the implications of the inevitable incompleteness of proprietary risk, accounting, and regulatory models?

- The Trend in institutional asset management has been toward decomposing and outsourcing the investment process between alpha generation and efficient beta exposures. Will this continue post-crisis? What are the challenges to proper management of this process? Hedge funds and proprietary trading desks have been significantly dislocated by the financial crisis. Will they continue to perform their financial functions or will new institutional forms replace them?

- Substantial regulatory changes will be a consequence of the financial crisis. Although there are still many important unresolved questions about the causes of the breakdown of the global financial system, there are some recommendations which are likely to be robust with respect to risk measurement, risk management, and government macro financial and bailout policies.

Functional Description of Being a Lender When There is Risk of Default and of Writing a Guarantee of Debt

RISKY DEBT + GUARANTEE OF DEBT = RISK-FREE DEBT

RISKY DEBT = RISK-FREE DEBT - GUARANTEE OF DEBT

<table>
<tr><td colspan="2">Corporation</td></tr>
<tr><td rowspan="2">Operating Assets, A</td><td>Debt (face value B), D</td></tr>
<tr><td>Common Stock, E</td></tr>
</table>

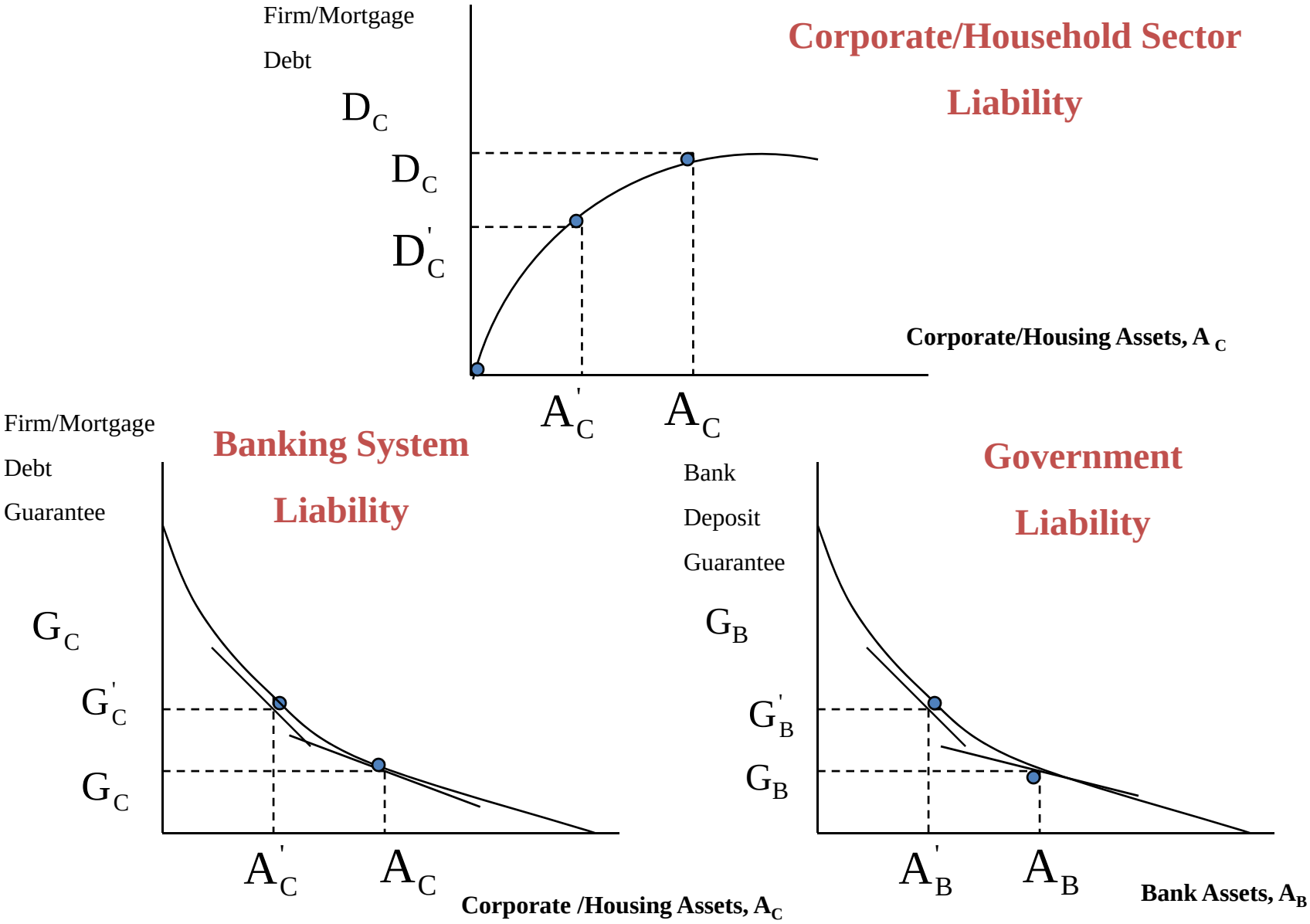
A = D + E

IN DEFAULT, THE HOLDER OF THE GUARANTEE RECEIVES PROMISED VALUE OF THE DEBT MINUS VALUE OF ASSETS RECOVERED FROM DEFAULTING ENTITY = MAX [0, B – A]

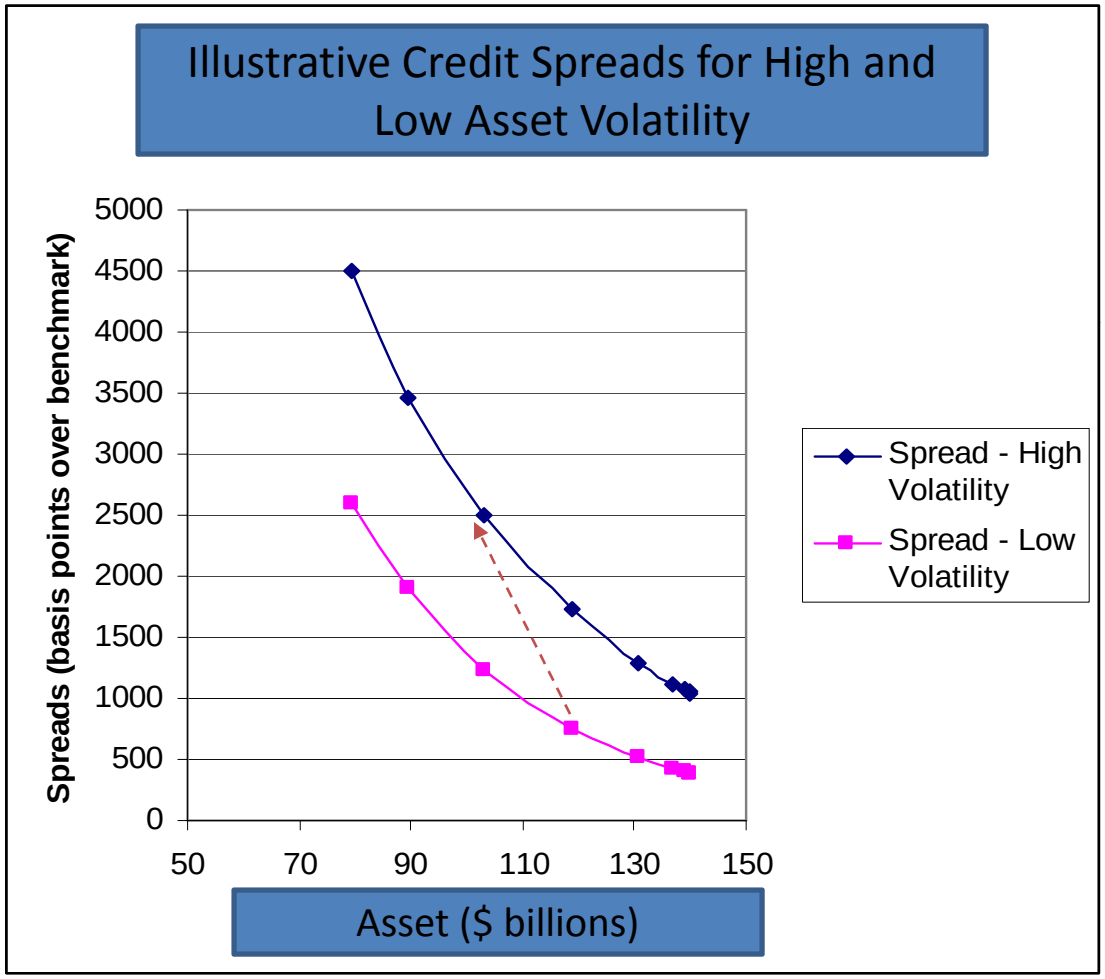
VALUE OF GUARANTEE = PUT OPTION ON THE ASSETS OF BORROWER

CREDIT DEFAULT SWAPS ARE GUARANTEES OF DEBT AND THEREFORE ARE PUT OPTIONS ON THE ASSETS OF THE BORROWER

Non-linear Macro Risk Buildup



Higher Credit Put Price when Asset Volatility Increases and Assets Decline



Effect of Non-linear Risk and Volatility Shift

5-Year Loan with $100 Principal

				% Change
Asset Value	$200	$160	$120	-40%
Asset Volatility	0.50	0.50	0.50	0%
Put Price	$14	$18	$24	+71%
B-S "Delta"	-.08	-.11	-.17	
Actual "Delta"	-.10	-.14	NA	

With Increasing Volatility

Asset Value	$200	$160	$120	-40%
Asset Volatility	0.50	0.75	1.00	+100%
Put Price	$14	$35	$53	+279%
B-S "Delta"	-.08	-.10	-.14	
Actual "Delta"	-.51	-.44	NA	

Innovation and Crisis: Behavioral: Familiar Risk versus New Risk

Corporate Pension Plan: Immunized match-funded: No risk to Corporation

Nonfinancial Corporation	
Operating Assets Pension Assets [100 long-maturity fixed-rate bonds]	Senior Debt Pension Liabilities [100 long-maturity fixed payments]
	Common Stock

Corporate Pension Plan: Mismatch Funded: Risky to Corporation

Nonfinancial Corporation	
Operating Assets Pension Assets [75 Common Stock; 25 bonds]	Senior Debt Pension Liabilities [100 long-maturity fixed payments]
	Common Stock

Risk Comparison:
Equities in Pension Fund VS. Swap

Incremental Pension risk is: receive: the total return on stocks on 75
Give up: the total return on bonds on 75

Derivative: Total-Return Equity Swap for Total-Return on Bonds on 75 notational amount

Incremental Swap risk is: Receive the total return on stocks on 75
Pay the total return on bonds on 75

Risk and Return on Equities in the pension fund is identical to Swap

On Mathematical Models in Finance Practice

"Any virtue can become a vice if taken to extreme, and just so with the application of mathematical models in finance practice. I therefore close with an added word of caution about their use. At times the mathematics of the models become too interesting and we lose sight of the models' ultimate purpose. The mathematics of the models are precise, but the models are not, being only approximations to the complex, real world. Their accuracy as a useful approximation to that world varies considerably across time and place. The practitioner should therefore apply the models only tentatively, assessing their limitations carefully in each application."

R.C. Merton, "Influence of Mathematical Models in Finance on Practice", *Phil. Trans. Royal Society of London*, 1994.

Models are Always Abstractions from Complex Reality: Implications for Ratings Agencies and Regulators

Credit Evaluation: 1) Probability of Default

2) Expected Recovery Rate in Default

3) Degree of Procyclicality in Default

Ratings Agencies (S&P and Fitch)

1) Ratings based on Probability of Default only

Incomplete model for ratings induces bias in assets selected for structures

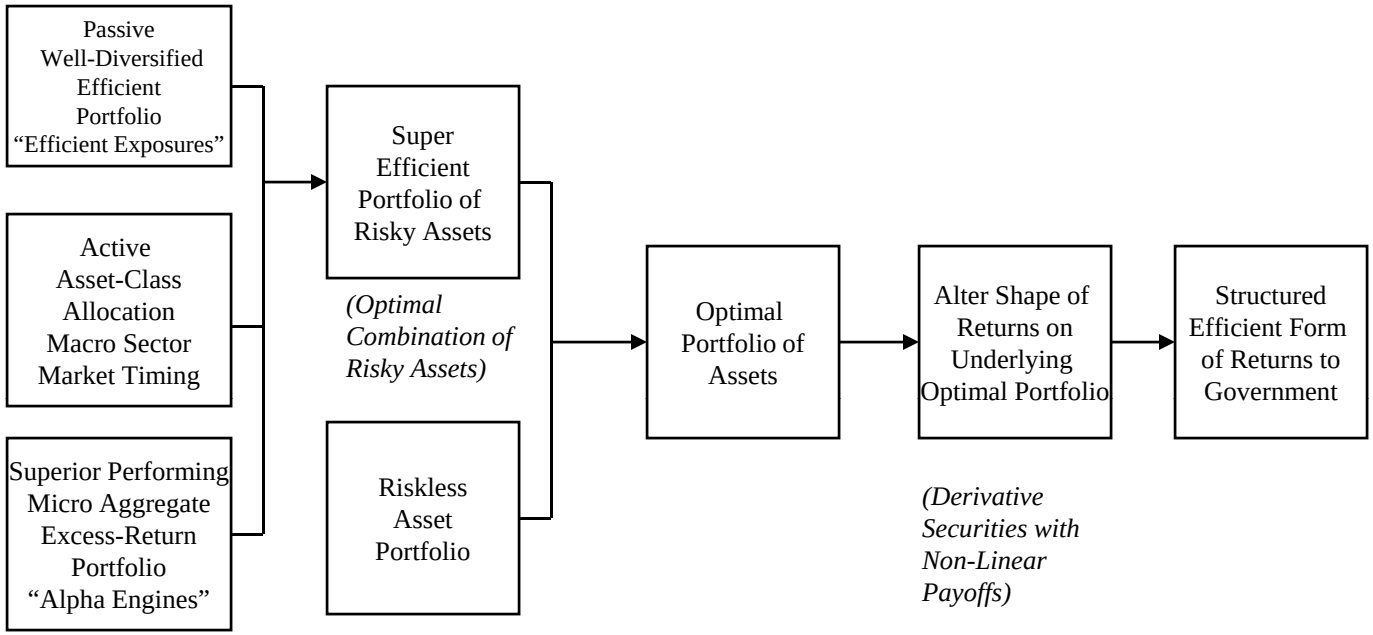
Behavior: Maximize value, subject to meeting ratings constraint

Minimize cost, subject to meeting ratings constraint

Prediction of bias in asset choices

- Low Expected Recovery Rate in Default
- High Procyclicality ("Beta") in Default

Domain of Investment Management: Stages of Production Process for Given Objective Function



- **Components of Best Performing Risky Assets Only Portfolio:**
- **Diversification Risk Modulation**

- **Risk Modulation through Hedging or Leveraging**
- **Constrained Asset Holdings**
- **Market Timing Active Management**

- **Risk Modulation through Insurance or non-linear leverage**
- **Pre-programmed dynamic trading**
- **"Building Block" State-Contingent Securities to create specialized payout patterns**

- **Expropriation efficient**
- **Regulatory efficient**
- **Liquidity tradeoff**
- **Transaction cost efficient**

Generating Superior Investment Performance: Traditional Alpha-Seeking versus Financial-Services Alpha

Traditional Alpha-Seeking

- Depends on being faster, smarter, better models or better information-inputs
- Is it sustainable? Is it scalable?
- The Cost of Active Investing

  Kenneth French
  Dartmouth College - Tuck School of Business; National Bureau of Economic Research (NBER)
  April 9, 2008
  Abstract:
  I compare the fees, expenses, and trading costs society pays to invest in the U.S. stock market with an estimate of what would be paid if everyone invested passively. Averaging over 1980 to 2006, I find investors spend 0.67% of the aggregate value of the market each year searching for superior returns. Society's capitalized cost of price discovery is at least 10% of the current market cap. Under reasonable assumptions, the typical investor would increase his average annual return by 67 basis points over the 1980 to 2006 period if he switched to a passive market portfolio.
- Non-economic costs and benefits

Financial-Services Alpha

- Depends on being lightly regulated, strong credit-standing, long-horizon, flexible liquidity needs, large pool of assets, reputational capital and sponsorship value
- Is it sustainable? Is it scalable?
- Is it a comparative advantage?

Destructive Feedback Loops: Guarantors writing Guarantees of their Own Guarantors

- *Guarantor writes a guarantee in which its assets will not be adequate to meet its obligations precisely in those states of the world in which it will be called on to pay.*
- Less-than-AAA government debt held by a bank whose deposits are guaranteed by that government.
- A corporation writing a CDS contract on its own debt
- Funding a corporate pension fund with the plan sponsor's own stock.
- The Pension Benefit Guarantee Corp investing in the equities of the companies whose pensions it guarantees.
- A company writing put options on its own stock.

Recommendations: Risk Measurement

- Financial institutions provide prescribed risk data to central processing authority on confidential or coded basis. Aggregate risk parameters to regulators and public.
- Fair-value accounting always required and considered by regulator, whether or not capital-adequacy ratios and other specific regulatory rules are based on it.
- Encourage development and implementation of risk-accounting reporting measures for non-financial firms.
- Creation of national Capital Market Safety Board (A. Lo). International coordination is critical but single global body unrealistic.

Recommendations: Risk Management

- OTC derivative contract positions between financial institutions and above a threshold size must have two-way mark-to-market collateral at least equal to the contract liability value, independent of credit rating.
- Central clearing for OTC contracts (above threshold volume).
- No financial product can be offered with either a fixed redemption price/NAV or a fixed rate of return without an explicit guarantor. E.g., money-market fund; stable-value fund.
- Require financial engineering expertise among senior management, board members, and regulators of financial institutions, including central banks, BIS, and IMF.

Recommendations: Government Regulation and Macroeconomic Policy

- Establish U.S. Sovereign wealth fund to hold and manage assets acquired. Separate from Reserve/Monetary Policy (Fed) and debt Management (UST)
- Government risk balance sheet with market-based estimates of the liability value and risk-exposures from guarantees.
- Functional perspective on regulation to be more dynamic and take into account non-linear risk exposures, connectedness / network coupling and mismatch of innovations and infrastructures to support them.
- Do not use legislation to perform business management and governance functions.
- Integrated macrofinance framework for macroeconomic and monetary model analysis and incorporation into policy setting.