

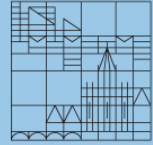
# Internal versus External Rules on Risk Taking

Günter Franke

Professor of International Finance

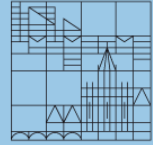
Universität Konstanz

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## Structure of the Talk

- I What triggered the crisis?
- II What needs to be framed?
- III On what should internal regulation focus?
- IV Limits to Internal Regulation
- V Needs for and Limits of External Regulation
- VI What can be done?

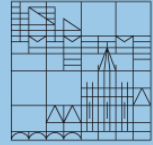


# I What triggered the crisis?

Many studies available.

Interaction between

- excessive mortgage backed lending fueling a price bubble
- easy transfer of credit risk through securitization
- high credit spreads on securitization tranches
- availability of complex structures (SIV, ABCP-conduits)



## II What needs to be framed?

Financial crises are mainly driven by bank managers  
bank shareholders

Shareholders largely out of reach of regulation.

Bank managers at the core of regulation.

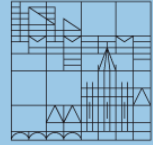
### Decision making of „single“ bank manager

Maximize  $f(x)$  = utility (income (x))

subject to various constraints

$$x \in X$$

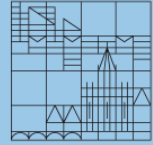
X is set of feasible manager choices



## Main difference between internal and external regulation

- external regulation constrains  $X$  by a standard approach being similar for all banks
- internal regulation constrains  $X$  by a bank specific approach

Constraining  $X$  imposes cost on manager  
→ regulatory arbitrage

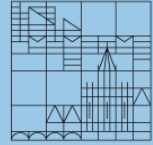


-- internal regulation determines manager income as a function of his policy

→ strong impact on managerial policy

important: choice of income (x)- function

External regulation so far ignores this important aspect



### III On what should internal regulation focus?

Most prominent:

Setting the income- function income (x)  
together with the choice set X

Income function determines incentives for risk taking

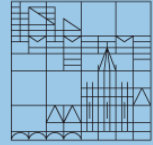
#### Elements of income function

--- composition of base salary, bonus payments, stocks-stock options

UBS 2006	6%	,	47%	,	47%	} top management
2007	22%	,	50%	,	28%	
DB 2007	13%	,	52%	,	35%	

--- definition of internal profit on which bonus depends

--- function relating bonus to internal profit



## Effect of profit participation rate on loan quality

rating	7 y-default probability	credit spread
AAA	0.285 %	0.75 %
AA	0.701 %	0.85 %
A	1.368 %	0.95 %
BBB	4.443 %	1.45 %
BB	15.110 %	3.45 %
B	32.903 %	7.70 %

100 loans of equal size in 10 different industries

Rating transition matrix of S & P.

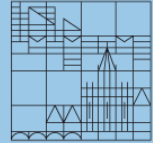
Simulate over 7 years.

LGD = 60 %.

Profit = interest earned  
 ./. default loss  
 ./. funding cost

Manager maximizes the present value of the certainty equivalents of his income over years 1 to 7. Constant relative risk aversion 2.5.

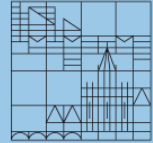




Total Income of Manager (in 1000 \$)				
Base Salary	105	80	55	5
Participation	1%	1%	2%	10%
Stock-share	0.1%	0.2%	0.2%	0.35%
Rating				
AAA	837.4	827.2	718.5	967.3
AA	842.3	832.4	728.0	<b>968.9</b>
A	846.3	836.4	735.3	929.1
BBB	861.3	851.1	761.2	826.7
BB	912.0	899.8	843.2	801.1
B	<b>997.0</b>	<b>980.8</b>	<b>973.0</b>	899.9

Calibration:  
Total income over  
7 years ~ 1 mio \$

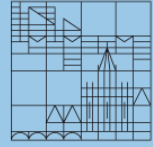
Low participation: Manager chooses bad loan quality.  
Higher participation induces better loan quality.  
Tradeoff between expected value and risk of income.



## Equally important: Choice of bank leverage

Total Income of Manager (in 1000 \$)				
Base Salary	Participation			
40	8%			
Volume	1	2	25	35
Borrowing Rate	3.25%	3.25%	3.25%	3.25%
Rating				
AAA	605.4	954.3	<b>8,345.8</b>	<b>11,306.1</b>
AA	631.7	994.8	7,097.7	8,886.4
A	648.0	1,007.7	5,237.6	6,159.1
BBB	682.7	992.2	2,604.5	2,708.3
BB	794.1	1,020.4	1,470.6	1,485.7
B	<b>994.4</b>	<b>1,223.1</b>	1,579.7	1,589.8

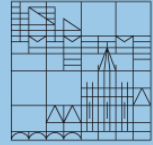
If bonus nonnegative, then manager maximizes leverage.  
 He prefers good loan quality, together with high leverage  
 → like SIVs, ABCP-conduits



Excessive risk taking dangerous for bank solvency.

Bank can buy large risk positions in financial markets at almost constant prices

In contrast: Industrial firm cannot double its output at constant sales prices.



## Remedies:

### (1) Rely on internal risk controlling?

Dangerous. Risk parameters optimi(stici)zed?

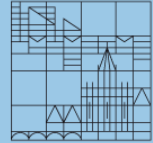
Model choice optimi(stici)zed?

Does risk controller income increase with profits?

### (2) Replace bonus system by bonus/ malus-system.

-- Firing trigger in manager's employment contract

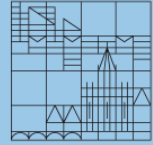
Limited effects!



- Include leverage penalty in the internal profit function  
e.g., bank's funding cost subtracted in internal profit  
increases with leverage

Total Income of Manager (in 1000 \$)						
Base Salary	Participation					
40	8%					
Volume	1	2	10	15	20	25
Borrowing Rate	3.25 %	3.3%	3.36%	3.44%	3.55%	3.75%
Rating						
AAA	605.4	891.2	2,913	2,925	3,065	2,527
AA	631.7	931.6	3,008	3,284	1,919	1,813
A	648.0	951.1	2,784	3,239	2,834	1,319
BBB	682.7	936.1	1,875	1,661	1,155	1,149
BB	794.1	990.7	1,310	1,280	1,194	1,132
B	994.4	1,203	1,482	1,482	1,411	1,344

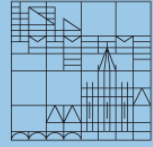
- Raise stock compensation, not options on stocks



## IV Limits to Internal Regulation

- Who determines the manager compensation?  
Can the manager influence it?
- How assure that the malus-component is not made ineffective by more advanced manager action?

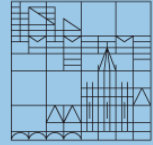
Example: If firing trigger depends on amount of default losses, manager reduces these by prolonging loans.



-- How assure that all risk taking is reflected in the internal profit?

Example: CP-funding of ABCP-conduits imposes default risk on liquidity line providers. Does this default risk reduce the internal profit of the manager?

-- Who determines the set of feasible manager choices?

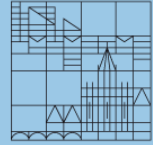


## V Need for and Limits of External Regulation

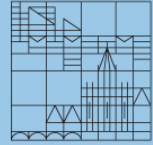
- Regarding manager compensation, external regulation should not be involved in the setup, but should insist on malus components
- Supervisory review process can help bank management to learn about potential pitfalls and risks, but lags behind.
- Many banks consider their risk position as private information (private good) ignoring that public info is required for smooth interbank trading (public good character).

External regulation should promote financial stability by improving risk reporting. → Difficult.





- External regulation on minimum equity capital requirements can hardly be effective regarding very detailed rules.
  - Model and parameter estimation risk.
  - Wide set of manager actions undermining detailed rules
  - External regulation ignores incentive systems.
  
- I sympathize with the simple proposal of the Swiss Federal Banking Commission to reduce bank leverage.  
KISS: Keep it (stupid and) simple.



## VI What can be done?

### -- Reform incentive system!

External regulation should check the existence of malus components.

### -- Check each agent in the value chain: Can his behavior be coordinated effectively by appropriate incentives?

Otherwise reintermediate and shorten value chain.

### -- External regulation should improve transparency of bank and product risks to prevent breakdowns of markets.