

# Capital Adequacy Ratio: A Managerial Framework

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## Three Key Findings

- The higher the target solvency level, the higher the required capital adequacy ratio
- The required capital adequacy ratio is dependent on the riskiness of the assets of the financial institution. The higher the riskiness of the assets, the lower the required capital adequacy ratio for a given target solvency level
- There is a relationship between the leverage ratio and the maximum riskiness of the assets of the financial institution. The higher the leverage ratio, the lower the maximum riskiness of the assets compatible with the target solvency level

# Structure of the Presentation

- Capital adequacy ratio as defined by the Basel Committee on Banking Supervision
- Required capital adequacy ratio
- Optimal solvency threshold
- Conclusion

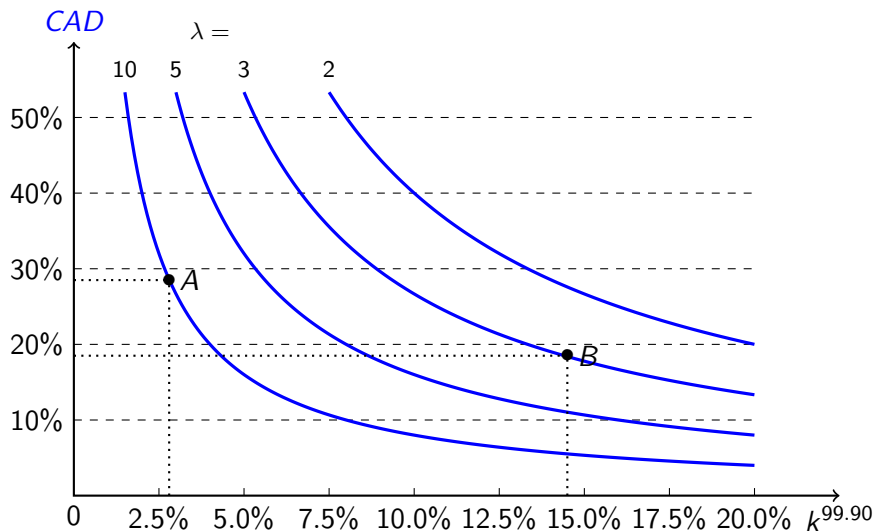
## Capital Adequacy Ratio

$$\begin{aligned} CAD &:= \frac{C}{RWA} \\ &= \frac{C}{12.5 \times K^{99.90}} \\ &= 0.08 \times \left( \frac{C}{V \times k^{99.90}} \right) \\ &= 0.08 \times \left( \frac{1}{\lambda \times k^{99.90}} \right) \end{aligned}$$

where

$$\begin{aligned} k^{99.90} &:= \frac{K^{99.90}}{V} \\ \lambda &:= \frac{V}{C} \end{aligned}$$

# Capital Adequacy Ratio



## Required Capital Adequacy Ratio

$$\begin{aligned} RCA^I &:= \frac{K^I}{RWA} \\ &= \frac{K^I}{12.5 \times K^{99.90}} \\ &= 0.08 \times \left( \frac{V \times k^I}{V \times k^{99.90}} \right) \\ &= 0.08 \times \left( \frac{k^I}{k^{99.90}} \right) \\ &= 0.08 \times \eta^I \end{aligned}$$

where

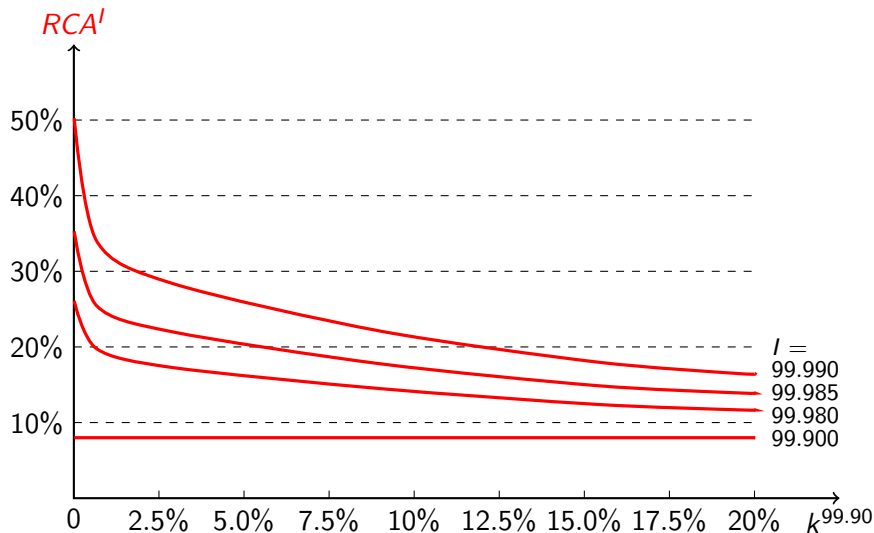
$$\begin{aligned} k^I &:= \frac{K^I}{V} \\ \eta^I &:= \frac{k^I}{k^{99.90}} \end{aligned}$$

# Required Capital Adequacy Ratio

Indicative numerical values

Rating	$k^{99.900}$ (%)	$\eta^{99.900}$	$\eta^{99.980}$	$\eta^{99.985}$	$\eta^{99.990}$
AAA	0.0099	1.00	3.26	4.41	6.28
A+	0.6704	1.00	2.47	3.18	4.25
A-	2.8930	1.00	2.16	2.75	3.55
BBB-	9.0229	1.00	1.81	2.22	2.76
BB-	15.3769	1.00	1.55	1.86	2.25
B	19.5295	1.00	1.46	1.74	2.06

# Required Capital Adequacy Ratio





## Optimal Solvency Threshold

$$C \geq K'$$



$$\frac{C}{RWA} \geq \frac{K'}{RWA}$$

$$CAD \geq RCA'$$

$$\frac{C}{V} \geq \frac{K'}{V}$$

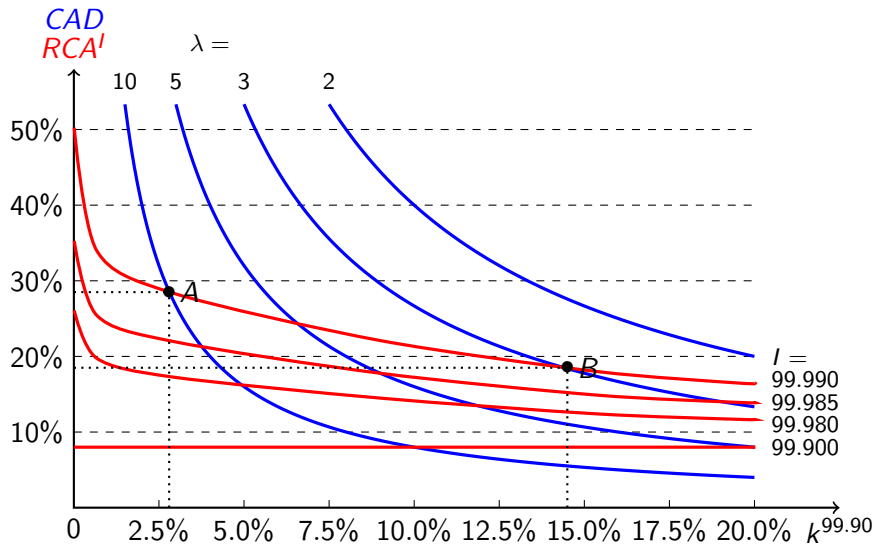
$$\frac{1}{\lambda} \geq k'$$

$$k' \leq \frac{1}{\lambda}$$

$$\eta' \times k^{99.90} \leq \frac{1}{\lambda}$$

$$k^{99.90} \leq \frac{1}{\lambda \times \eta'}$$

# Optimal Solvency Threshold



# Conclusion

- The higher the target solvency level, the higher the required capital adequacy ratio
- The required capital adequacy ratio is dependent on the riskiness of the assets of the financial institution. The higher the riskiness of the assets, the lower the required capital adequacy ratio for a given target solvency level
- There is a relationship between the leverage ratio and the maximum riskiness of the assets of the financial institution. The higher the leverage ratio, the lower the maximum riskiness of the assets compatible with the target solvency level
- The comparison of the solvency parameter between financial institutions should be made taking into account the riskiness of their respective portfolios