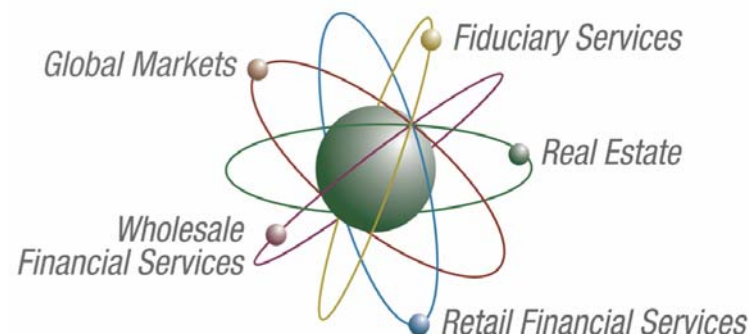




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*The Sumitomo Trust & Banking
Co., Ltd.*



Economic Capital Management in The Sumitomo Trust and Banking Co., Ltd.

July 11, 2007

**Corporate Risk Management Department
Yasuhiko Tara**

- 1. Framework of Economic Capital Management**
- 2. Calculation of Integrated VaR**
- 3. Management & Administration Process**
- 4. Principles of Risk Capital Allocation**
- 5. Topic—Management of Equity for Relationship Purpose**
- 6. Conclusion**



1. Framework of Economic Capital Management



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Framework of Economic Capital Management [1]

Important points in our economic capital management system

- Bifocal evaluation through capital adequacy and capital efficiency
- Risk management using integrated risk amount measure
(= Credit + Equity + Interest Rate + Operational)
- Taking correlations between risk categories into account
- 99.9% confidence interval

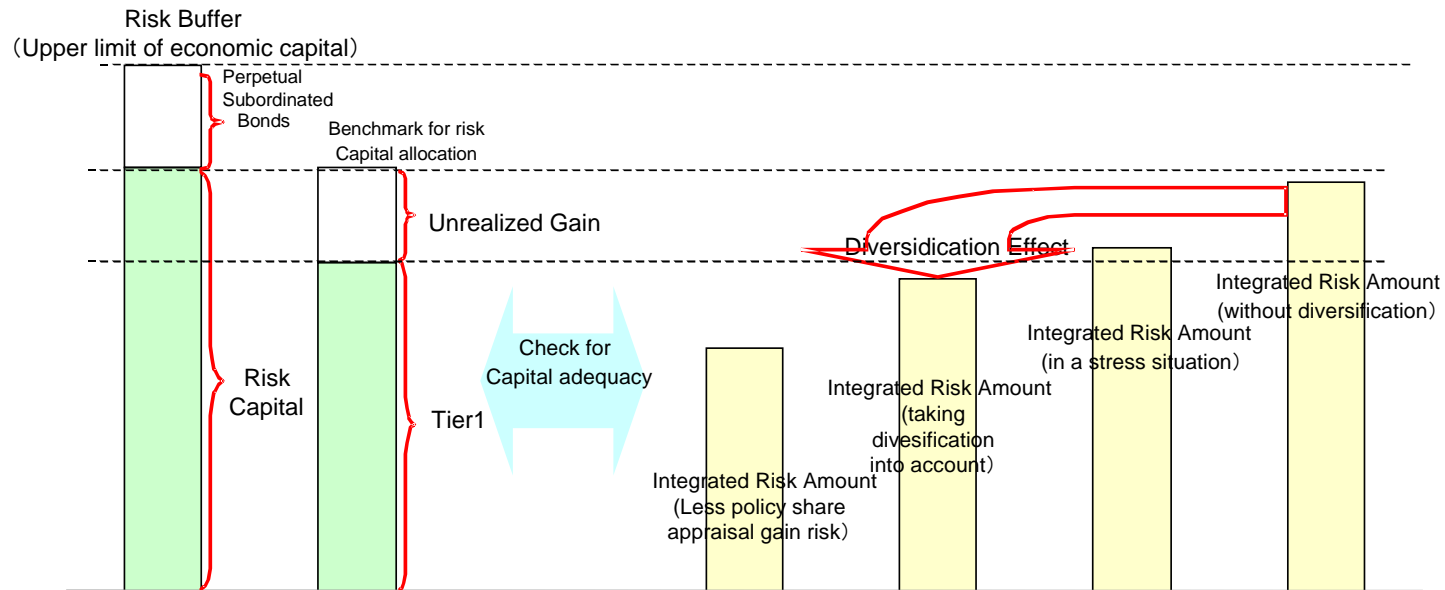
Framework of Economic Capital Management [2]

Capital Supply

- **Risk Capital = Tier1 + Unrealized Gain * 60%**
⇒ Benchmark for allocation to departments
- **Risk Buffer = Risk Capital + Perpetual Subordinated Bonds**
⇒ Upper limit of economic capital

Capital Demand

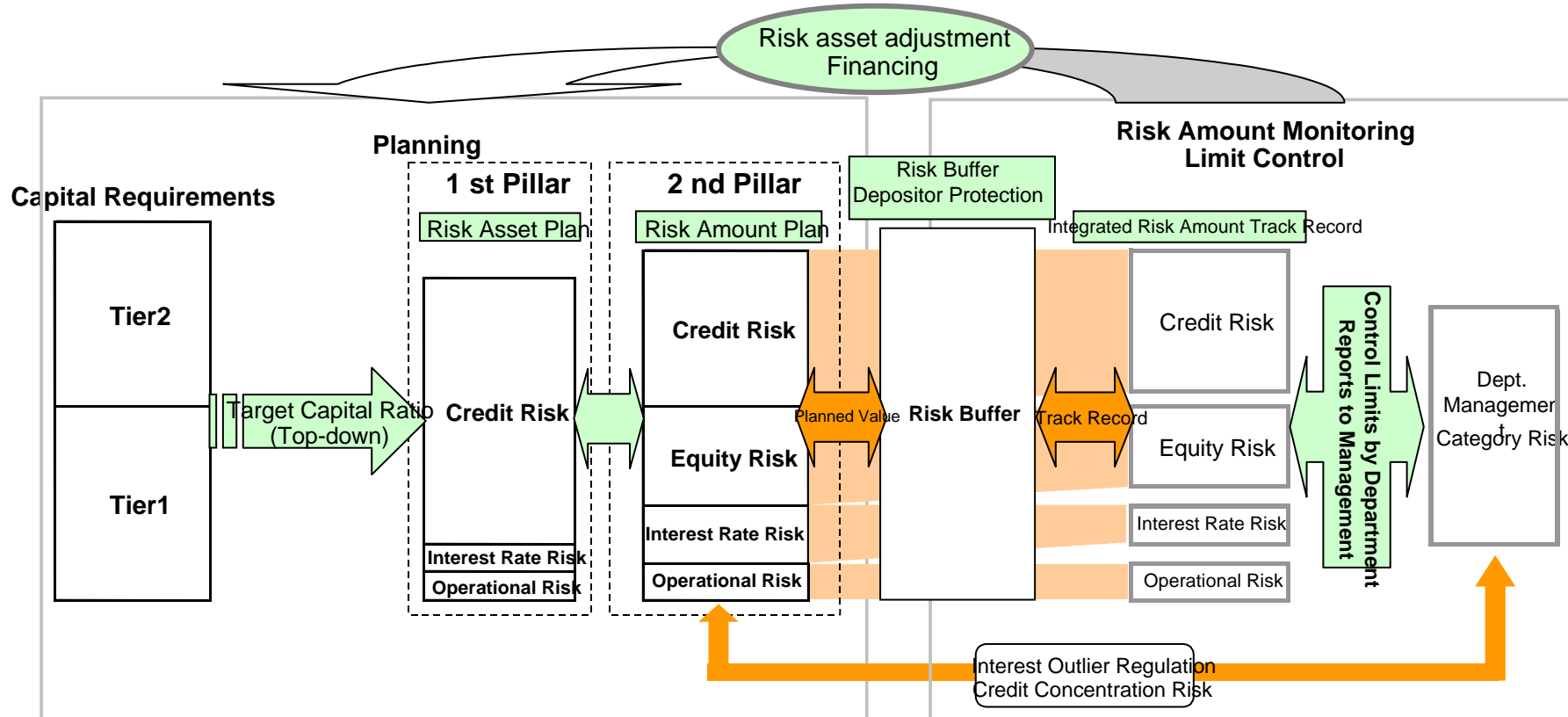
- **Integrated Risk Amount (taking diversification into account)**
⇒ Calculation of strategically necessary risk amount in usual situation
- **Integrated Risk Amount (in a stress situation)**
⇒ Calculation of potential risk amount in a stress situation where there is little diversification effect



Framework of Economic Capital Management [3]

Framework of economic capital management - capital adequacy

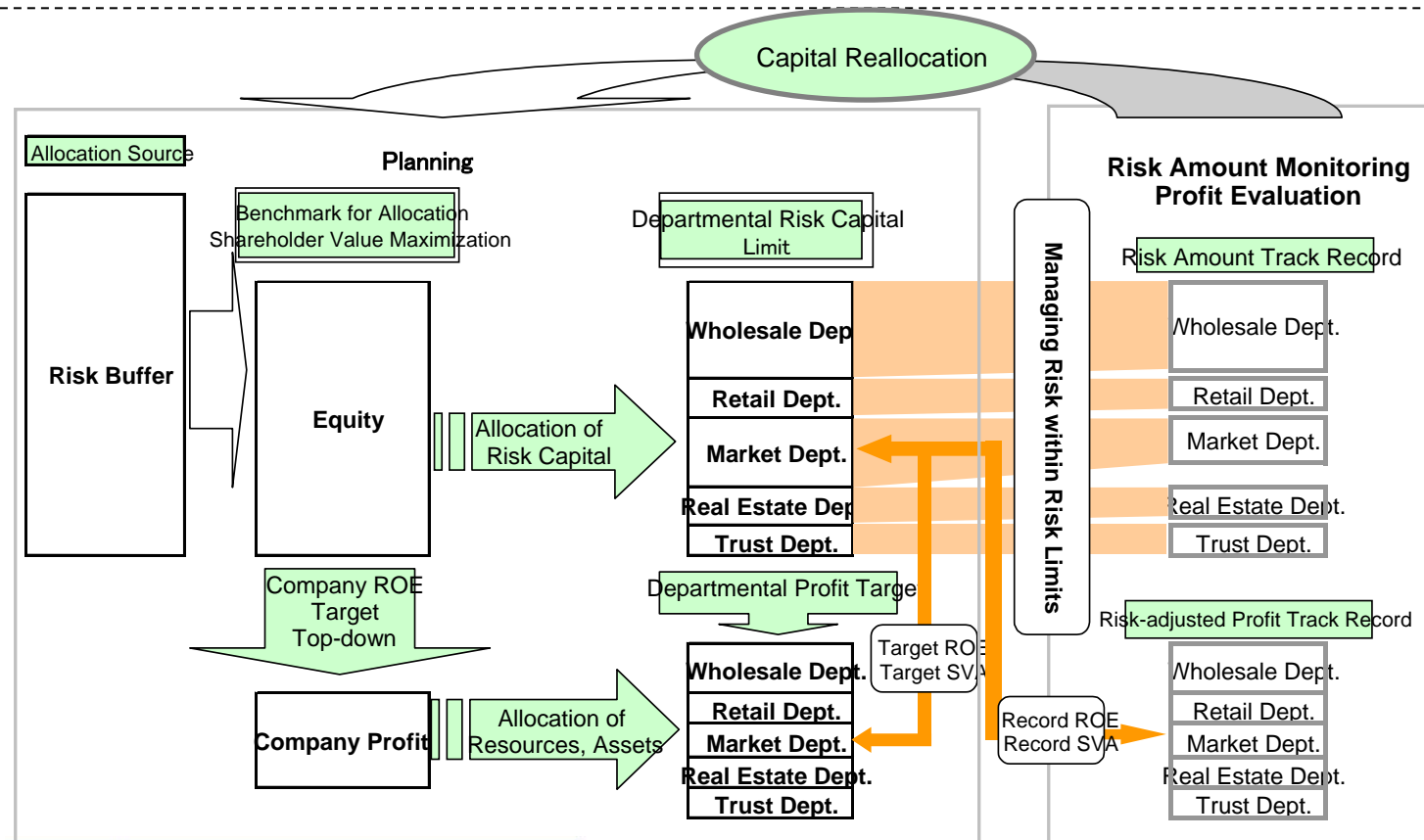
- **Depositor Protection** ⇒ Set target capital adequacy ratio ⇒ Risk buffer ⇔ Check adequacy by integrated risk amount in a stress situation.
- During period: Monitor all company/departmental/category risk amounts. Control using limit/guidelines.



Framework of Economic Capital Management [4]

Framework of economic capital management – capital efficiency

- **Shareholder Value Maximisation** ⇒ Set target ROE ⇒ Allocate risk capital ⇒ Target ROE, SVA for individual departments
- During period: Monitor risk amounts/profits of individual departments ⇒ Period end: evaluate performance using ROE/SVA track records ⇒ Reallocate capital



2. Calculation of Integrated VaR



Calculation of Integrated VaR [1]

(1) Purpose

- Our integrated VaR calculates measurable risk for all companies in the group using a uniform standard. The purpose is to calculate risk capital on an economic capital basis.

Preconditions for Integrated VaR

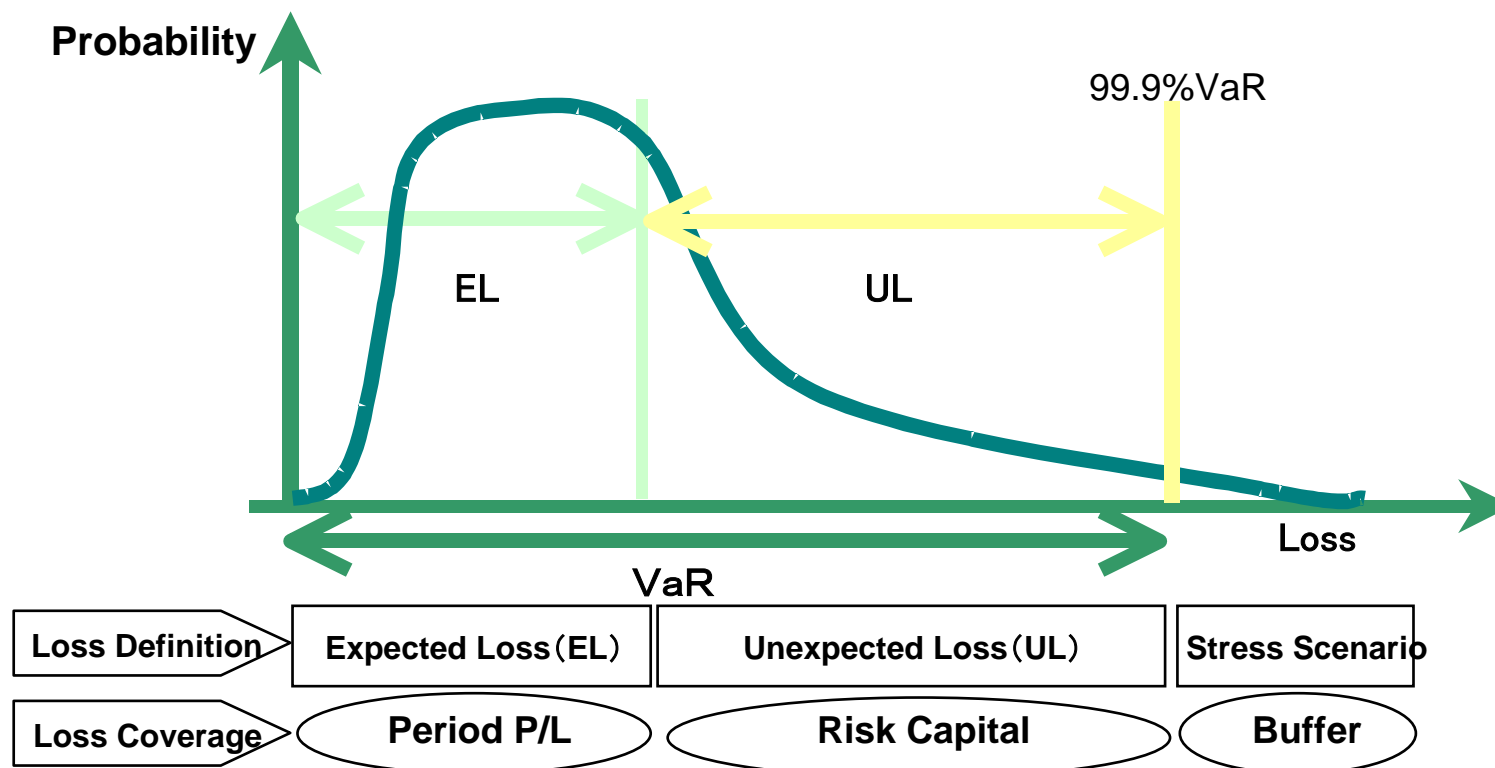
- Calculation of unexpected losses
- Holding period of 1 year
- Confidence interval of 99.9%
- Coverage: Credit Risk, Market Risk, Operational Risk (on a consolidated basis including all group companies)
- Correlations between risk categories taken into account

Calculation of Integrated VaR [2]

(2) Concept of risk capital measurement

- Risk capital corresponds to UL of measured integrated VaR.

Risk measurement by means of integrated VaR



Calculation of Integrated VaR [3]

(3) Credit Risk

- UL by means of credit VaR (default mode) taking concentrated risk into account
- 100,000 step Monte Carlo simulations

(4) Market Risk

Step1 Measurement of departmental management VaR

- Variance Covariance Method + Historical Simulation Method
- Holding Period:1 day for trading, 21 days for banking
- Confidence Interval: 99%

Step2 Change into integrated VaR

- A scaling factor using historical yearly volatility and daily volatility instead of the simple root T method is used to extend the holding period to 1 year.
- Confidence interval is changed from 99% to 99.9% assuming a normal distribution.

Calculation of Integrated VaR [4]

(5) Operational Risk

- Estimate loss distribution and frequency distribution from internal loss and loss scenario, and calculate VaR by means of Monte Carlo simulations.

(6) Equity Risk

① Equity Risk (held for relationship purpose, trading purpose)

- Listed shares: VaR Unlisted shares: same as with regulatory capital

② PE Funds

- Risk amount rate by market index is used.

③ Group Companies (equity)

- Calculate changes in net assets by means of similar industry β * Market Index Volatility from an equity method perspective.

④ Strategic equity investment quota

- Reserved by management as expeditious response measures during the period.

Calculation of Integrated VaR [5]

(7) Category Risk Aggregation

- When adding up all risk categories, correlations among the credit, equity and interest rate categories are taken into account to help with strategic risk capital allocation.
- Correlations among categories are determined taking into account market indices and expert judgments.

◎Risk Category Correlation

	Credit Risk	Equity Risk	Interest Rate Risk
Credit Risk	1	++	-
Equity Risk	++	1	-
Interest Rate Risk	-	-	1

*++: Strong positive correlation, +: Weak positive, -: Weak negative, --: Strong negative

3. Management & Administration Process



Management & Administration Process [1]

(1) Initial Planning Process

- ① **Board of Directors** sets the strategic targets and capital plan (top-down).
- ② **Capital Allocation Committee** presents Risk Capital Allocation Guidelines on the basis of the above strategic targets and capital plan.
- ③ **Departments** devise P/L plans and BS plans on the basis of the Risk Capital Allocation Guidelines (bottom-up).
- ④ **Capital Allocation Committee** adds up the departments' risk amounts based on P/L and BS plans, ascertains that they are within the scope of our financial resources, consults with departments about measures for the allocation of capital to more effective fields and risk reduction if necessary, and proposes risk capital quotas to the **Management Committee**.
- ⑤ After discussions at the **Management Committee**, risk capital quotas are determined by the **Board of Directors**.

Management & Administration Process [2]

(2) Interim Monitoring

- ① **Corporate Risk Management Department** monitors and reports to the Board of Directors on a monthly basis the ratio of the risk buffer to the integrated risk amount (in a stress situation), the ratio of the risk capital quota to the integrated risk amount (diversification adjusted) and the ratio of the risk capital quota to risk amount by category/department.
- ② **Corporate Risk Management Department** notifies Capital Allocation Committee when the risk amount exceeds or threatens to exceed the risk buffer or risk capital quota.
- ③ **Capital Allocation Committee** studies the causes of excess risk (external factors or deviation from the management plan, temporary or continuous, etc.) and proposes measures to be taken (additional allocation of risk capital, risk reduction plan, etc.) to the **Management Committee (Board of Directors)**.
- ④ **Management Committee (Board of Directors)** decides on the measures to be taken.

Management & Administration Process [3]

(3) Use of Risk Adjusted Performance Measure

- ① On the basis of the department's risk capital quota, a profit target is set using the risk adjusted performance measure (RAPM) at the beginning of the period.
- ② Departmental SVA and Departmental ROE are the RAPM.
 - ▶ Departmental SVA: Risk-adjusted Profit(*1) - Capital Cost(*2)
 - ▶ Departmental ROE: Risk-adjusted Profit(*1) / Risk Capital Quota
- *1 Departmental Operational Profit less Credit Cost
- *2 Risk Capital Quota * Hurdle Rate
- ③ Plan progress is monitored during the period and the results are used for the next period's capital allocation plan.
- ④ At the end of the period, RAPM achievement ratios are recorded as part of the department's performance assessment.

4. Principles of Risk Capital Allocation



Principles of Risk Capital Allocation [1]

(1) Basic Capital Allocation Strategies

- ① **Medium-term Financial Targets (Management top-down)**
 - Continuous achievement of 12% ROE (capital efficiency)
 - 7 to 8% TIER I ratio (capital adequacy)
- ⇒ Simultaneous achievement of efficient capital usage and stable profit growth.

Principles of Risk Capital Allocation [2]

② Capital allocation strategy from a business portfolio management perspective

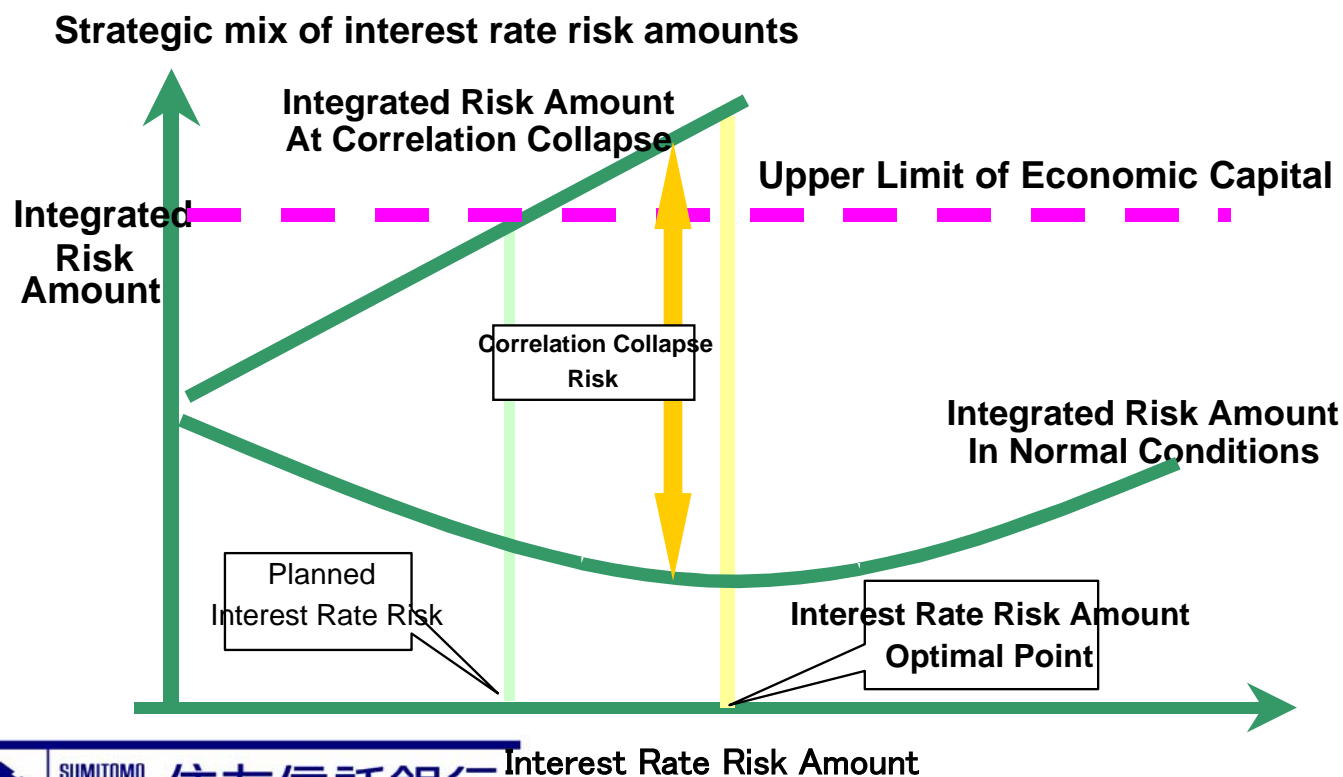
- Business management by division system
 - Business portfolio management = Management of diversification effect

 - **Basic strategy for risk capital allocation**
- ⇒ To diversify away the volatility of each departments' assets and profits with business portfolio diversification effects and to realize the **efficient capital usage** and **stable profit growth**.

Principles of Risk Capital Allocation [3]

③ Asset Volatility Perspective (= VaR)

- Reduce the integrated risk amount to **less than the sum of the each department's risk amounts** by utilizing correlations among risk categories, and gain maximum return with limited capital.



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Principles of Risk Capital Allocation [4]

④ Profit Volatility Perspective (\approx EaR)

- Multiple business units with differing profit/risk characteristics → **Profit diversification effect**
- **Reduce company profit fluctuation margins** and allocate resources on the basis of risk category profit trends (sources of departmental profits) to seek **continuous profit growth.**

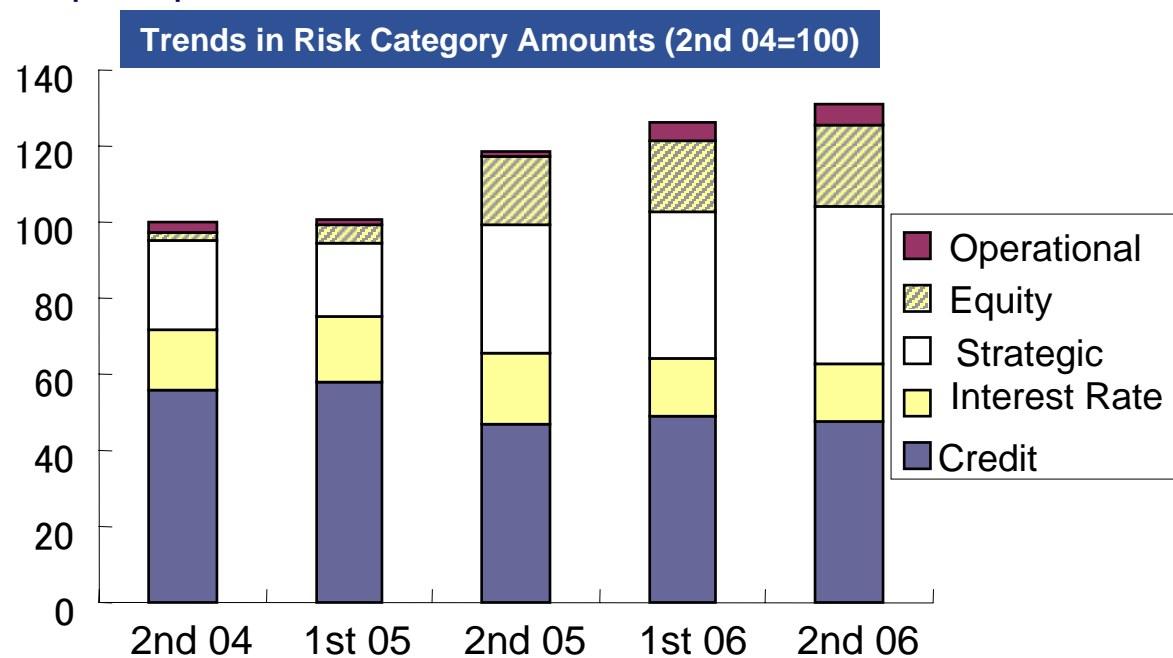
(2) Setting risk capital allocation guidelines

- ① Understanding the external environment
- ② Profit trends by department (risk, return)

Principles of Risk Capital Allocation [5]

(3) Other matters to be studied

- Credit risk amounts have been decreasing. Equity risk amounts (investment and M&A) have been in the expected range.
- Strategic shareholding risk amounts have been increasing due to increases in market values, resulting in a decrease in allocation to other resources.
- With limited capital, it is necessary to study how to manage Equity for Relationship Purpose for more effective risk allocation.



(4) How to allocate risk capital

- ① Capital allocation at the **departmental level**
 - ② Integrated risk amount (diversification effect adjusted) is allocated for RAPM (Department ROE, Department SVA). **The contributions of each category to the diversification effect are not taken into account.**
 - ③ Additive risk contribution is ideal and calculable from the perspective of optimal capital allocation, but it is not used for departmental performance evaluation.
- ⇒ **Evaluation will not serve as an incentive for individual departments if correlations outside the control of individual departments are taken into account.**

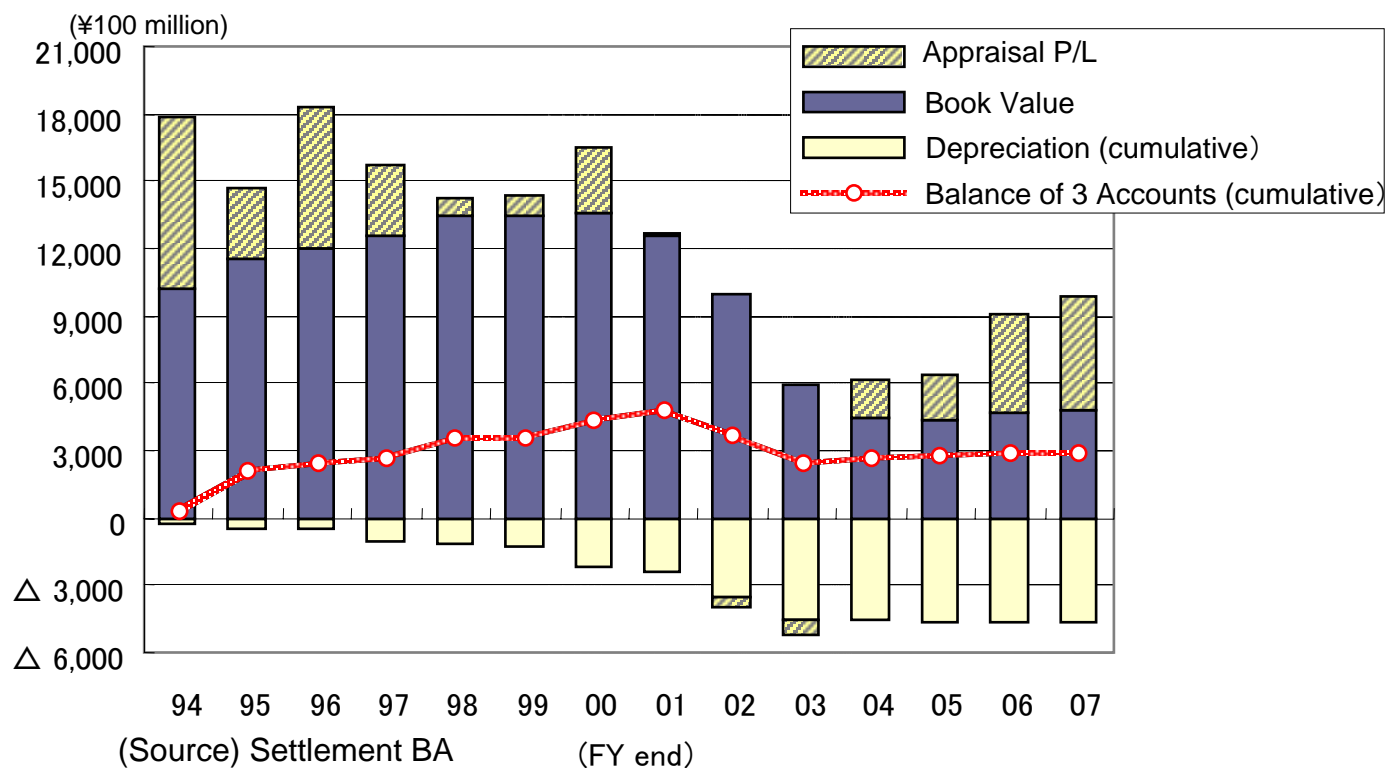
5. Topic – Management of Equity for Relationship Purpose



Management of Equity for Relationship Purpose [1]

(1) Trends in Balances

- Funds for handling actualized credit risk (up to FY98) ⇒ Decrease in appraisal P/L + increase in book value
- Company-wide efforts to reduce level of risk to match underlying business strength (from FY99) ⇒ Increase in depreciation + decrease in book value
- As a result, book value fell below Tier 1 and the holding amount (book value basis) has leveled out.



Management of Equity for Relationship Purpose [2]

(2) Impact on accounts (EaR)

- EaR is determined by the difference between market value and book value (= appraisal P/L). Decreases in book value due to depreciation and subsequent increases in market value reduce depreciation risk.
- From an EaR perspective, profit volatility decreases → Shareholder value increases

(¥100 million)

	Expected Dep.	99.9 percentile		
		To latent profit	Depreciation	To latent profit
94/3	1	0.0%	2,971	38.9%
95/3	24	0.8%	3,220	101.4%
96/3	1	0.0%	2,234	35.6%
97/3	37	1.2%	3,662	116.9%
98/3	794	110.5%	8,799	1223.8%
99/3	713	81.1%	8,506	967.7%
00/3	233	8.0%	7,315	252.4%
01/3	892	430.8%	8,178	3950.6%
02/3	1,092	-213.2%	7,228	-1411.6%
03/3	789	-124.0%	3,962	-623.0%
04/3	16	1.0%	1,857	116.7%
05/3	1	0.1%	1,004	52.0%
06/3	0	0.0%	0	0.0%
07/3	0	0.0%	312	6.1%

※1. Expected depreciation is calculated as a 1-year put option with book value as the exercise price.

※2. Depreciation for VaR (1-year holding period, 99.9% confidence interval)

Management of Equity for Relationship Purpose [3]

(3) Impact on corporate value

- On a short-term basis, an increase in market value increases VaR. However, this is around 100%, which can be covered by latent profit.
- An increase in VaR suggests a need to rebalance risk allocation and realise appraisal profit

(¥100 million)

	TOPIX Vol.	VaR	To latent profit
94/3	19.2%	10,610	138.9%
95/3	14.0%	6,396	201.4%
96/3	15.0%	8,507	135.6%
97/3	14.0%	6,794	216.9%
98/3	21.6%	9,518	1323.8%
99/3	21.1%	9,385	1067.7%
00/3	20.0%	10,213	352.4%
01/3	21.3%	8,385	4050.6%
02/3	23.0%	6,716	-1311.6%
03/3	20.5%	3,326	-523.0%
04/3	18.3%	3,448	216.7%
05/3	15.0%	2,936	152.0%
06/3	15.7%	4,414	98.6%
07/3	17.6%	5,385	106.1%

*VaR calculated by Market Value * Annual TOPIX Volatility Rate *
3.09 (99.9 percentile)

Management of Equity for Relationship Purpose [4]

(4) Impact on BIS capital adequacy ratio

- Expected appraisal profit in 6 months and a 99.9 percentile BIS ratio
- Expected BIS ratio will be 11.49% (0.09% increase from end of March 2007) due to latent profit.
- If latent profit decreases, at the 99.9 percentile level, the BIS ratio will be 10.36% (▲1.04% decrease).

End of March 07 BIS Ratio	Expected BIS Ratio (in 6 months)	Difference	99.9 percentile BIS Ratio (in 6 months)	Difference
11.40%	11.49%	0.09%	10.36%	-1.04%

Management of Equity for Relationship Purpose [5]

(5) Risk indicator

- ① VaR, ② Net Appraisal Profit, ③ EaR
- With an increase in latent profit, the risk amount calculated using ① VaR increases. This poses some problems.
- The risk amounts calculated using ② net appraisal profit and ③ EaR decrease.
- These indices have their advantages and disadvantages. VaR, which is calculated on the basis of economic capital, is the main index for the bank, which has adopted a business portfolio strategy.

Index	Advantage(s)	Disadvantage(s)
VaR	Contributes to the effective use of capital when the market is brisk and stock prices are increasing.	Anomalous that risk amount increases when the market is brisk.
Net Appraisal Profit	Risk indicator for accounting period P/L	Risk amount does not increase until the market falls. Will not serve as an early warning indicator.
EaR	Same as above	Same as above

Management of Equity for Relationship Purpose [6]

(6) Hedging strategy

① Basic hedging strategy

With an increase in the equity risk amount calculated using VaR:

- Sell stocks with low risk/return profile (terminate the client relationship).
- If **excess profit (α)** can be expected through holding a equity, do not change the client relationship (do not change the book value of the equity held for relationship) and control the portfolio risk amount by means of an index hedge.
- Control positions in client securities which have fallen significantly in value or in which the degree of concentration is high using individual hedges.

② Management problems

- Setting hedge ratios
- Management implementation framework
- Accounting problems

6. Conclusion



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Conclusion—[1]

VaR Perspective: Capital Release

- Optimise Interest Rate Risk and Credit/Equity Risk
- Hedging Equity Risk

- Use of released capital to be judged at management level (dynamic)
- Investment Index \Rightarrow Marginal VaR-based RAPM \geq Hurdle Rate

EaR Perspective: Medium-term Profit Stability

- Business portfolio with medium-term stability (stable)
- Risk within departments = Return optimization to be assigned to individual departments

- RAPM before the diversification effect for evaluation at the departmental level
- RAPM on the level of transactions within the same risk category

Management

Departments

Business Lines

Transactions



Conclusion—[2]

(1) Advantages of introducing economic capital management

- Management tool that serves as common language for staffers and external parties
- PDCA cycle established for risk management
- Important benchmarks established for investment decisions

(2) Future trends

- More strategic management planning (capital reallocation strategies)
- Securing more active risk control measures
- Profit/capital appraisal on transactions basis