# APPLICATIONS OF EXTERNAL LOSS DATA FOR OPERATIONAL RISK WITH KOREC
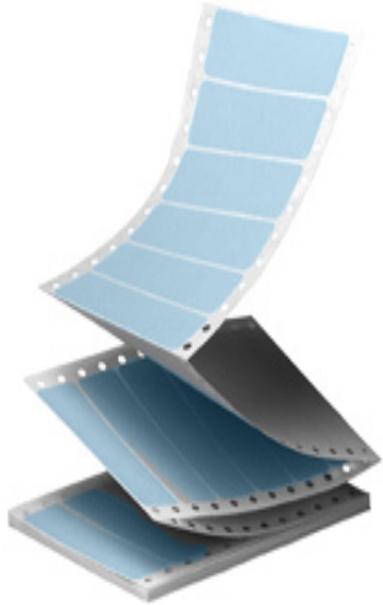
**- Presented by -**

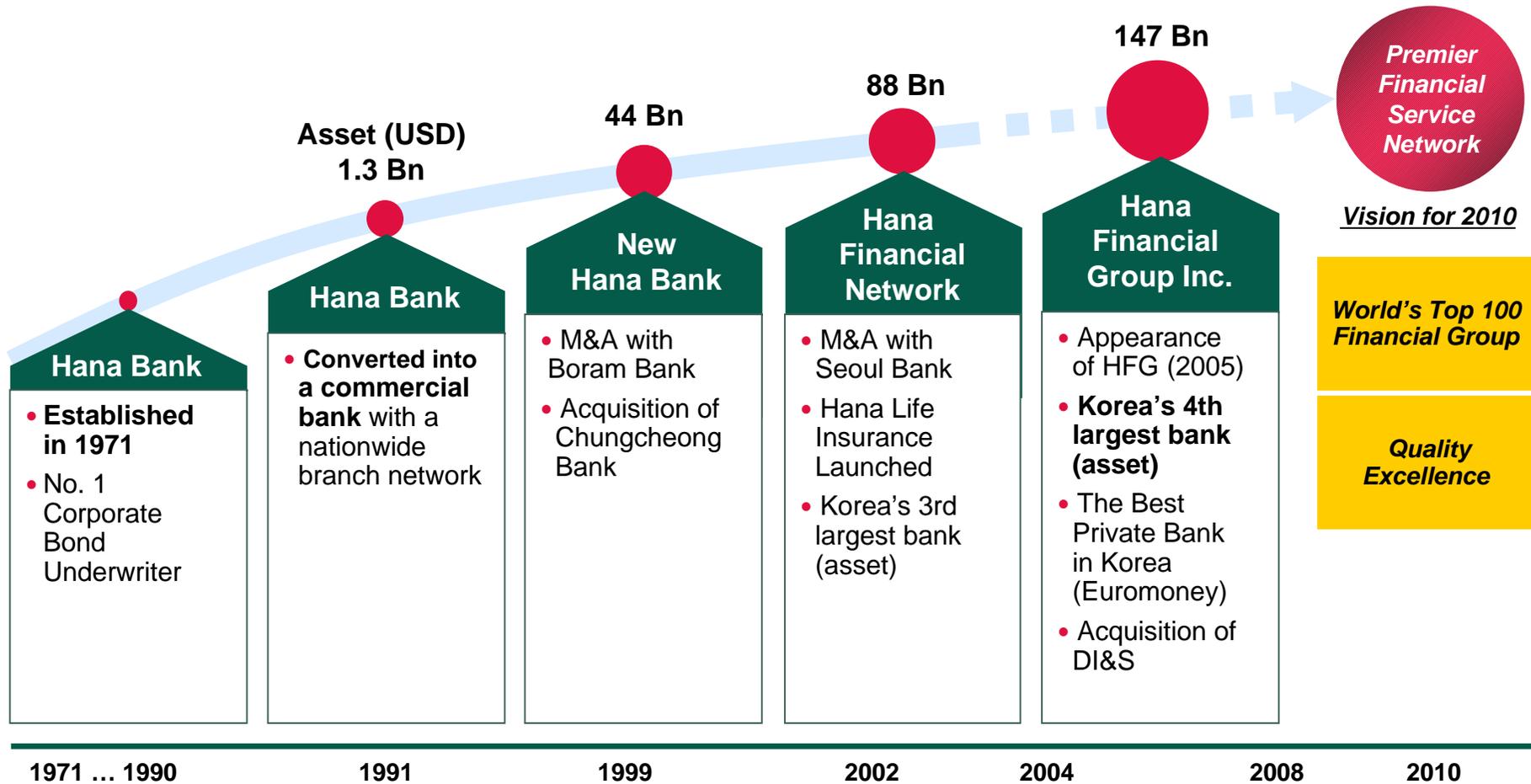**Chong-ho Kim**

March 19, 2008

**KOREC**

Hana Financial Group

# Contents

# 1.1 History of Hana Bank

**Hana, for the 36 years, never posted a single loss, never skipped paying dividends**

*Growth through successful transformational M&As and operational excellence*

*Build a Distinctive Platform to accelerate growth*

*Realize Synergies from Consolidation*

**147 Bn**

**88 Bn**

**44 Bn**

**Asset (USD) 1.3 Bn**

*Premier Financial Service Network*

*Vision for 2010*

### Hana Bank

- **Established in 1971**
- No. 1 Corporate Bond Underwriter

### Hana Bank

- **Converted into a commercial bank** with a nationwide branch network

### New Hana Bank

- M&A with Boram Bank
- Acquisition of Chungcheong Bank

### Hana Financial Network

- M&A with Seoul Bank
- Hana Life Insurance Launched
- Korea's 3rd largest bank (asset)

### Hana Financial Group Inc.

- Appearance of HFG (2005)
- **Korea's 4th largest bank (asset)**
- The Best Private Bank in Korea (Euromoney)
- Acquisition of DI&S

*World's Top 100 Financial Group*

*Quality Excellence*

| 1971 … 1990 | 1991 | 1999 | 2002 | 2004 | 2008 | 2010 |

# 1.2  Financial Highlights of Hana Bank

## Highlights

|  | FY2007 |
|---|---|
| ◆ Net Income (Bn USD) | 1.40 |
| ◆ ROE | 14.45% |
| ◆ ROA | 1.06% |
| ◆ Total Assets (Bn USD) | 150.0 |

## Credit Ratings

|  | 2005 | 2006 | 2007 |
|---|---|---|---|
| Moody's | Baa1 | A3 | A1 |
| Fitch | A- | A- | A- |
| S & P | A- | A- | A- |

## Major Shareholders

| | |
|---|---|
| ANGELICA INVESTMENTSPTELTD | 9.6% |
| GSDejakoollc(FDI) PledgeAccount | 8.6% |
| ALLIANZ FINANCEB.V. | 4.7% |
| MSILP-PLEDGEEOR1305 | 4.2% |

## More Information

- ◆ 7,873 Employees
- ◆ 752 Branches
- ◆ 12 Branches Overseas
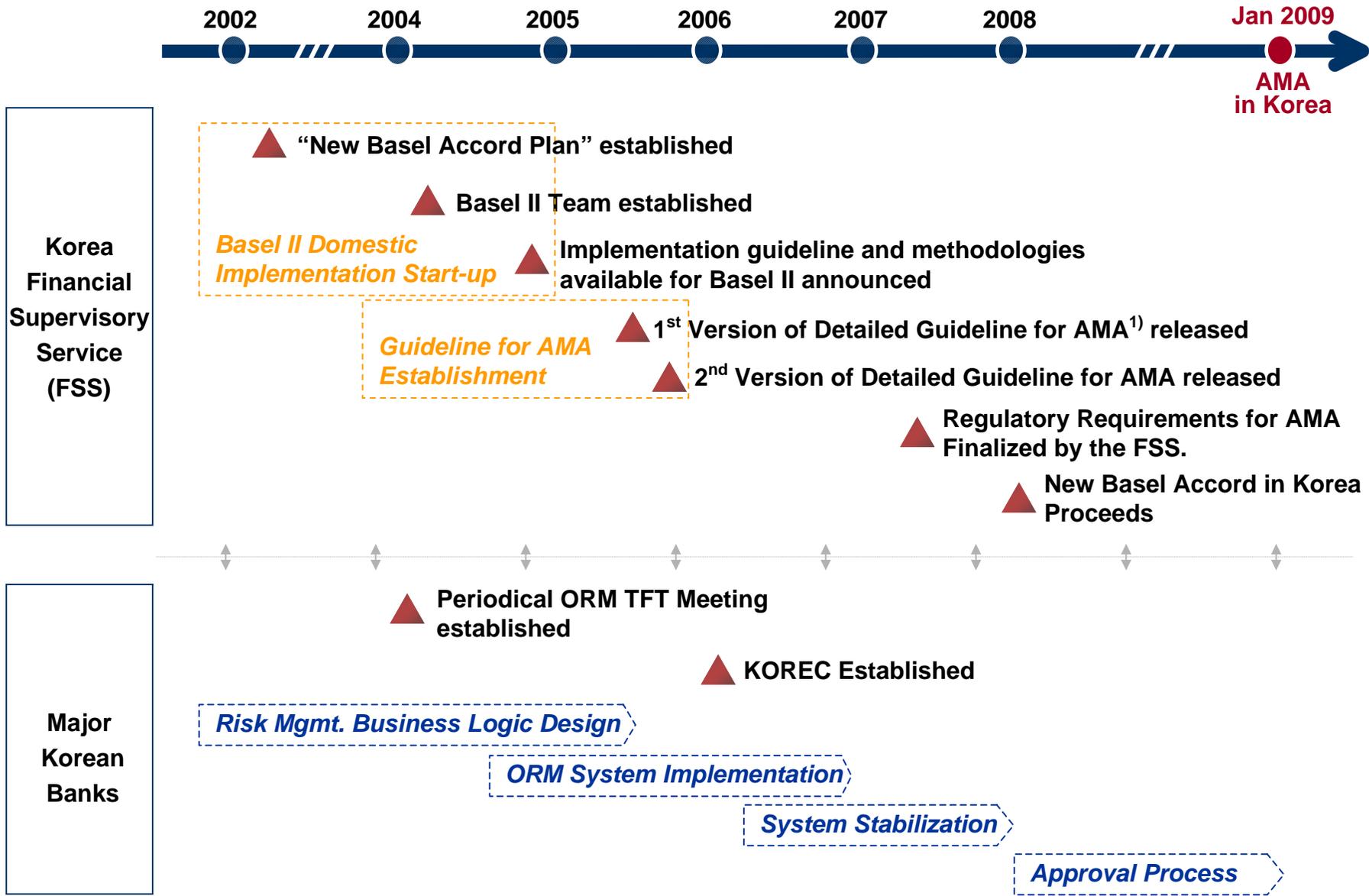  (5 in progress of opening or acquisition)



Shanghai Branch

Shenyang Branch

Hong Kong Branch

Tokyo Branch

Singapore Branch

Qingdao International Bank

NY Agency
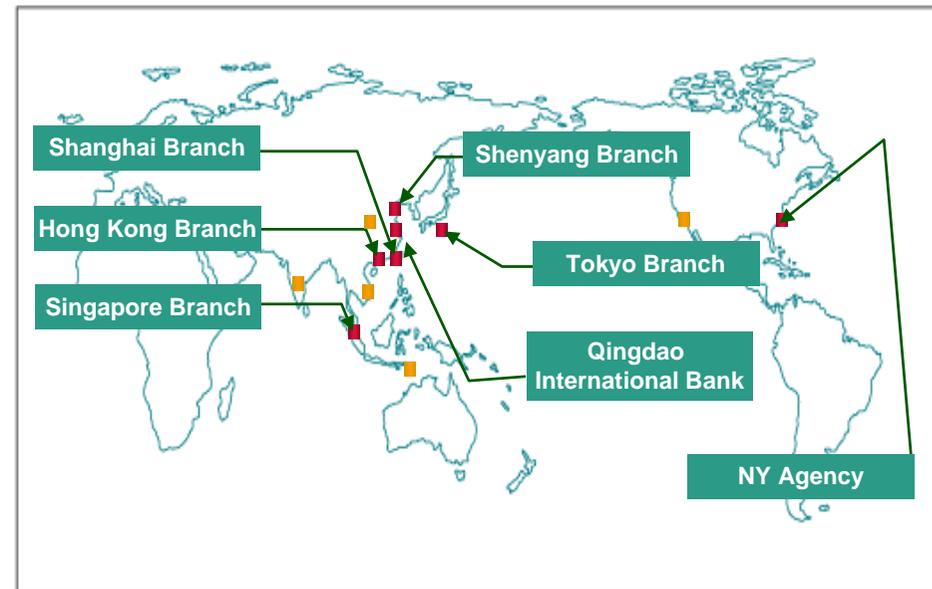
<< Overseas Network >>

# 2. Korea Banking Industry

# 2.1 Status of Basel II Preparation



Timeline: 2002 — 2004 — 2005 — 2006 — 2007 — 2008 — **Jan 2009 AMA in Korea**

**Korea Financial Supervisory Service (FSS)**

- "New Basel Accord Plan" established
- Basel II Team established
- Implementation guideline and methodologies available for Basel II announced
- 1st Version of Detailed Guideline for AMA[1] released
- 2nd Version of Detailed Guideline for AMA released
- Regulatory Requirements for AMA Finalized by the FSS.
- New Basel Accord in Korea Proceeds

*Basel II Domestic Implementation Start-up*

*Guideline for AMA Establishment*

**Major Korean Banks**

- Periodical ORM TFT Meeting established
- KOREC Established

*Risk Mgmt. Business Logic Design*

*ORM System Implementation*

*System Stabilization*

*Approval Process*

1) AMA: Advanced Measurement Approach

## 2.2  Periodical ORM Meetings

**Cooperation and exchanging information between the FSS and major domestic banks are one of the key features to prepare for AMA in Korean Banking Industry**

### Korean Banks' Common Concerns on ORM

- Ambiguous  AMA requirements by Basel

- What would the FSS regulatory requirements be like?

- What is the difference between ORM and traditional ones?

- How do we measure capital with insufficient loss data?

- Is there anybody to help us or share all these concerns with us?

### Rising Needs for Periodical ORM Meetings



**Korea Financial Supervisory Service**

*Knowledge & Experience Sharing*

*Basis for Regulatory Requirements of AMA*

# 2.3 Motivation to Loss Data Consortium

## Deficiency of Loss Data

① How to prioritize Risks to be managed

② How to do causation analysis to elicit Manageable RIs

③ How to produce scenarios

④ How to find distributions & parameters?

```
Loss Data → RCSA  ①
Loss Data → RI     ②
Loss Data → Internal Control  ③
Loss Data → Scenario  ④
Loss Data → Measurement  ⑤
Loss Data → Validation  ⑥
```
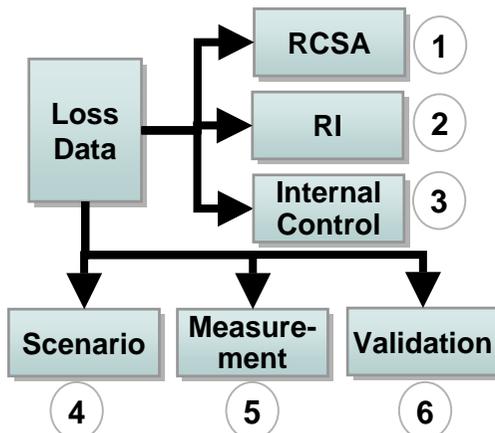
*Relevant & Reliable External Loss Data is Needed for ORM*

## Limit of Public Data

- Usually more than 1 million dollars
- Could be a benefit to add to tail losses
- Helps scenario evaluation & scenario creation

However.

- Hard to find reliable & relevant data due to different financial environments
- Scaling problem
- Data credibility

**KOREC**

# 3. KOREC

# 3.1 About KOREC

**March 2005**

▶ Major Banks Agreed to share loss data

**August 2005**

▶ The Establishment of the Consortium Policy and **Detail Standards for Loss Data Collection**

**January 2006**

▶ Beginning of KOREC

**March 2006**

▶ First Assembly of KOREC (Members transferred their 2 years of loss data to the KFB* for data management

*KFB = Korea Federation of Banks*

| | |
|---|---|
| **Entry Requirements** | • Regulation and systemization for loss data collection process should be established.<br><br>• Validation by third parties should be carried out periodically for the loss data and its collection process.<br><br>• Ability to provide at least its two years of loss data that is systematically collected before entering KOREC. |
| **Member Institutions** |  |
| **Ownership** | KFB Administrate Data Management Process |
| **Exchange Cycle** | Quarterly |

| **Loss Amount Threshold** | 10 Million Korean Won |
|---|---|

# 3.1 About KOREC

## Relevant Regulations

### Regulations of KOREC

- Name, Purpose
- Entry and secession of members
- Responsibility of members
- Roles of the governing body of loss data
- Organization and Functions of the committee

### Specific submission criterion of loss data

- Data liable for submission, time of submission
- The lowest amount of submission
- Basic date of submission
- Specific items of loss data and
- classification criterion

### Sanctions criterion on loss data sharing

- Sanctions criterion
- Suspension of sanctions

### Loss data sharing computational system design document

- System operation procedure

# 3.1  About KOREC

## Organizational Structure

**General Meeting**

**Board of Directors (BOD)**

**Committee**

- Organization : ORM team heads of participating banks.
- Entry approval, selection and change of the governing body of loss data, change of regulations and approval requested by Committee of practical affairs.

**Committee of Practical Affairs**

- Organization : ORM staffs in charge of loss data
- Qualification examination of the banks, newly applied for an admission
- Decision and change of the method regarding loss data management in practical ways.
- Report to the committee of decisions made by the committee of practical affairs.

**Governing Body of Loss Data (Korea Federation of Banks)**

- Verification of the submitted loss data
- Analysis of the submitted data
- Providing loss data to members
- Security control
- Providing the data & standardized reports

# 3.2 Competitiveness of KOREC

# 3.2 Competitiveness of KOREC

## 1) Regular Meetings with Member Banks

### ① Continuous maintain the consortium policy & Standard for loss data collection

- Amended the admission criteria & fee
- Supplemented the specific loss data submission criteria by collecting issues

### ② Distribute guidelines to Loss Data Classification Criteria

- Classification analysis of obscure loss data by business lines and event types

### ③ Holding a Workshop for Annual Performances

### ④ Regular Participation of FSS

**Discussions**

# 3.2 Competitiveness of KOREC

## 2) Specific Description of Each Loss Data

**Descriptions of Loss Data**

- Specific description(s) is included in each loss data of KOREC
- Applicable to RCSA, PI, KRI, Scenario, Capital Measurement, Internal Control, etc.
  - With the descriptions, each bank can add to their examination tools.
- Possible to specify risks by referring to loss event description.



**Invisibility**

# 3.2 Competitiveness of KOREC

**System Diagram**

**Classification of System Security Area**

Members

| Shinhan Bank | Woori Bank | Hana Bank | Industrial Bank of Korea | Kookmin Bank | Korea Exchange Bank |

The Korea Federation of Banks

**Korea Federation of Banks File Transmission Proprietary Network**

Loss Data Management Institution

**Fire Wall**

**Loss Data Server**

KOREC

Hana Financial Group | **15**
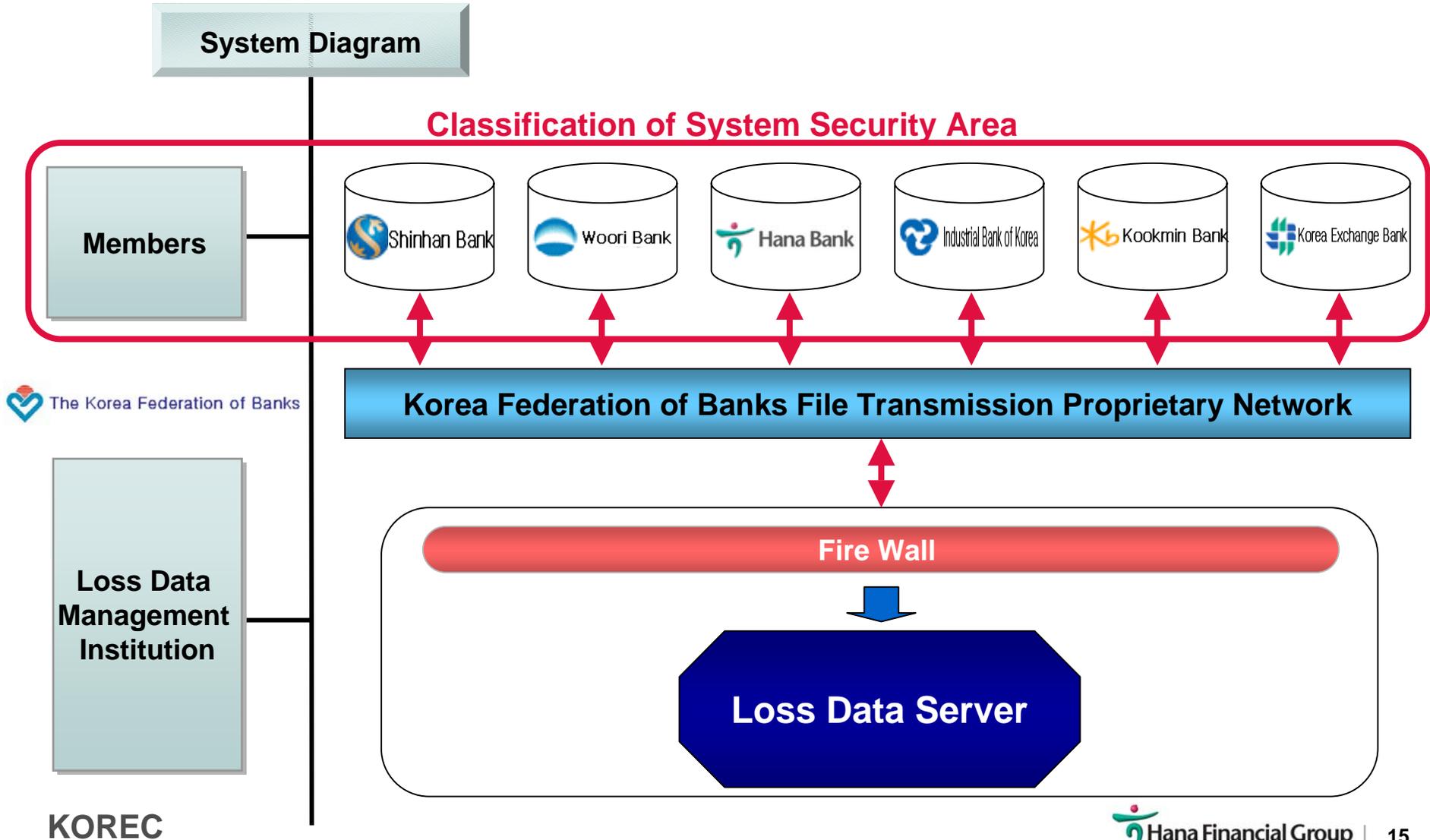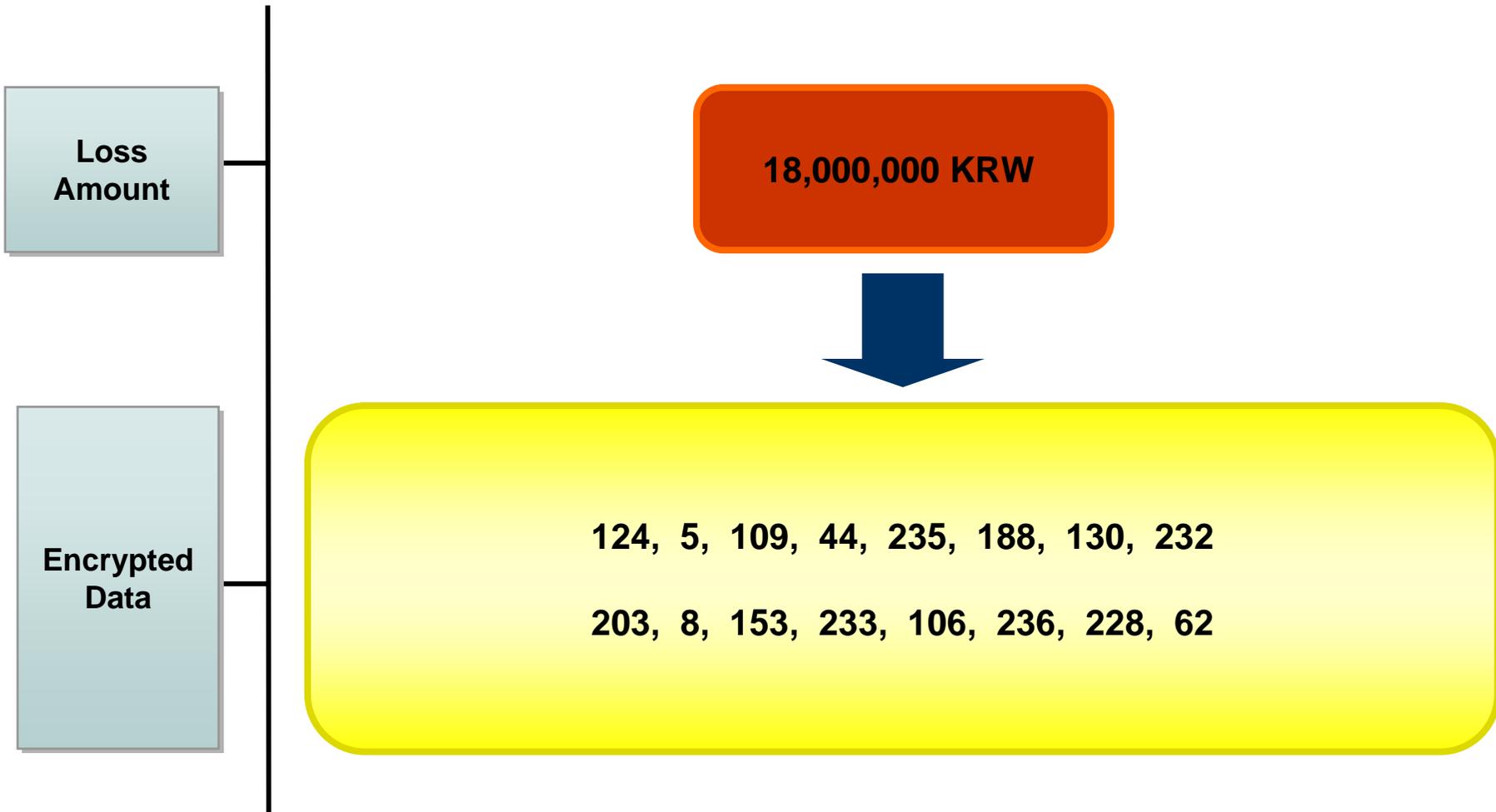
# 3.2  Competitiveness of KOREC

## 4) Various analysis Reports

| Analysis Reports | • **KOREC analysis reports include all analysis of :**<br>✓ **Number of Events by Business Lines & Event Types**<br>✓ **Quarterly Trend ( Based on Discovery Date )**<br>✓ **Summary by Business Lines**<br>✓ **Summary by Event Types**<br>✓ **Summary by Causes of Event Types**<br>✓ **Summary of Average Total Loss ( per Event )**<br><br>• **KOREC Distinguished reports include all analysis of :**<br>  1) **Exposure indicator**<br>  2) **Frequency & severity analysis with distributions**<br>  3) **Benchmarks** |
|---|---|
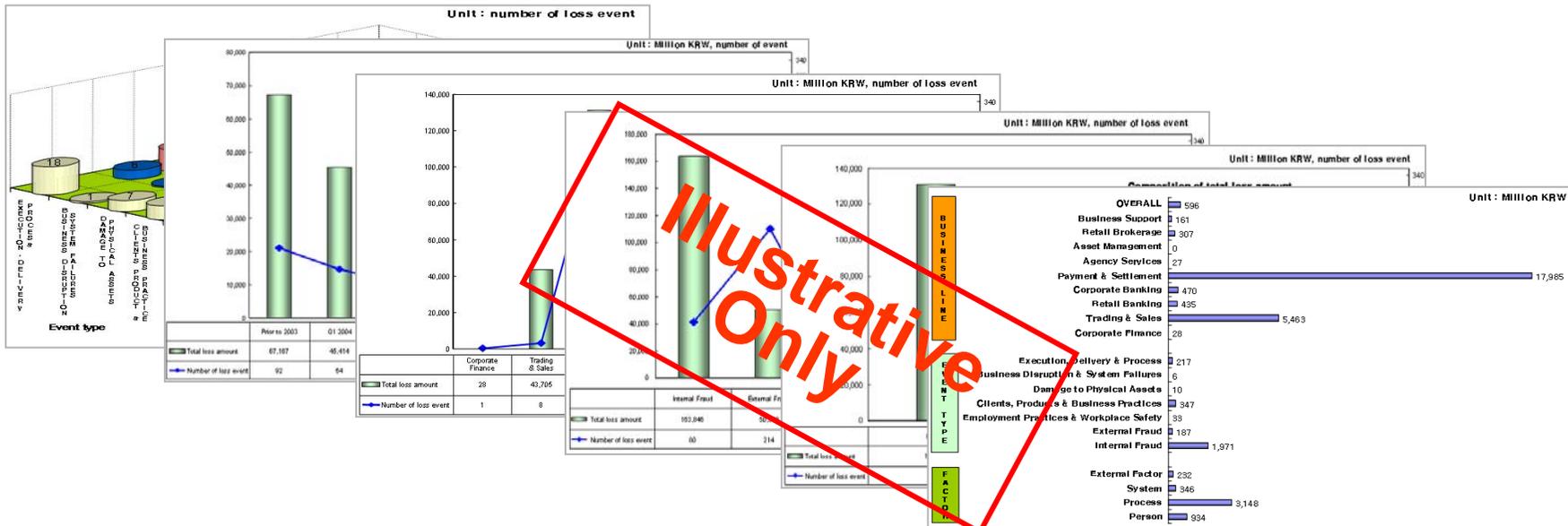
# 4. Applications

# 4.1 Overview

## APPLICATIONS OF KOREC DATA

1. Prioritize Risks to be Managed

2. Application for RCSA / RI

3. Application for Scenario

4. Application for Validation

5. Application for Capital (VaR) Measurement

# 4.2 Prioritize Risks to be Managed
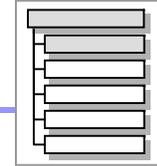
## 1) Limit of RCSA for Key Risk Awareness

**Risk & Control Assessment**

- Risk Owner Assessment
- Control Assessment
- Internal Loss Data Analysis

### Assessment Result (By MRC, 2007. 12.)

| Biz. Area | Risk Type | Risk Profiles | Risk Assessment Intrinsic | | Risk Assessment Resid-ual | | Control | Control Assessment / Issues Monitor-ing & Security | Control Assessment / Issues Role Separ-ation | Control Assessment / Issues Auto-mation | Ctrl Level | RI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | S | F | S | F | | | | | | |
| Investment Mgmt. / Derivative Trade | Internal Fraud by Dealer | Risk to lose market price incurred by a dealer | 4 | 3 | 2 | 1 | 1. The Back office should get the market price from several brokers directly | 3 (Weight: 0.2) | 2 (Weight: 0.3) | 1 (Weight: 0.5) | 2.5 | |
| | | Front collusion with broker | | | | | 2. ... | [Issue] Not enough periodical reporting of middle position | [Issue] Stock price to acquired by both back and front, not by risk side, now | [Issue] Stock price input manually, not automatically | | |
| | | Financial Risk: 3 Billion ~ 0.5 Billion | | | | | | | | | | |

### Limit

- Assessment criteria are different depending on assessors.

- Not much changes of assessment results

- Difficult to estimate a level for inexperienced risks

- Burden for employees to assess every potential risk

# 4.2  Prioritize Risks to be Managed
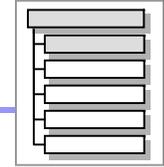
## 2) Key Risk Selection of Management Target

- Key risks are needed to be  selected as management target focusing on actual events such as internal and external loss data.
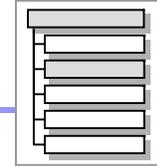
## 1) Application for Generation of New Risk Profile and KRI

- To check unrecognized risks

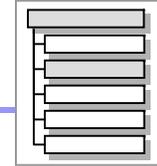- Application for New product & new RI generation

KOREC Data     Existing risk profile     KOREC Linkage

| Bank | Date | Description | Total loss amount | BUC | ACT | Risk profile | Check |
|------|------|-------------|-------------------|-----|-----|--------------|-------|
| K Bank | 2007. 09.13 | Penalty payment to FSS due to the violation of Bancassurance registration | 10,000,000 | Agency sales of Bancassurance | Signature | The risk possibility of violation for legitimate and operation instructions from sale related to sale of Bancass products due to the lack of knowledge among employees. For instance, sale of non specialized employee, unconfirmed addresses, lack of signature and low immunity for revocation of products, fragmented sales... | ✓ |
| S Bank | 2007. 09.06 | In August 2017, a customer swindler who represent himself falsely by sound distribution of CD company had been put CD branch of Y bank with account fillers to use certificate or employment receipt obtained in use tax although paid applied for conditions. The detail of this event had confirmed that it was the employee of CD company though telephone with or faxing the number had inquired in AS-Link about continuing to transact with CD bank and had passed safety deposit. It had processed Elite account CC million won. | 50,274,776 | Loan-commitment contract | Personal verification | The risk possibility of risk for fraudulent behavior from outsider. For instance, fraud, ... forged name like bank's loan agreement, involvement of our related personnel or location, such as ... forest fraudulent loan, execution form of basic inequality of personal and table state or transact. | ✓ |
| S Bank | 2007. 06.22 | S Bank has paid penalty tax of corporate income tax by various types according to tax importance... SNTS as of 2006, p.18. The litigation has been in progress by SR group. | 38,450,210 | Introduction of products | Sending business letter for introduction of new product | The risk possibility of risk that the new products foster registration after to the change of actual policy. | New Profile |

**Reflecting New Risk Profile**

# 4.3  Application for RCSA / RI

- KOREC data is also used as a reference data  when risks and controls are assessed.
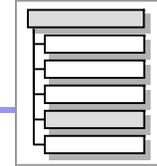
# 4.4  Application for Scenario

## 1) Application for Scenario Assessment

- When assessing scenarios, KOREC data is provided to support objective evaluation by assessors.

**Scenario Analysis**

**Business Line :** Retail Banking   **Event Type :** Internal Fraud   **Contact :** Manager XXX   **Date :** 2004. 02

**Reference Risk ID :** 012   **Risk Description :** Risk of Embezzling from Clients' accounts by Staff

### Scenario Type

| | | Typical case | Serious case | Worst case |
|---|---|---|---|---|
| **Severity** | Amount(won) of a loss event | 100,000,000 | 5,000,000,000 | 20,000,000,000 |
| **Frequency** | Number of Losses per Year | 3 | | |
| | One loss every X years | | 10 | >10 |
| | (X=2~3, 4~5, 6~8, 9~10, >10) | | | |

### Historical Information

**Internal Loss Event**

Loss ID : 0062, 2003-05-15, XXX employee who... ...embezzled in XX branch.
Loss ID : 0152, 2074-...-06, yyy employee ...embezzled...

**External Loss Event**

...(Total profit is ...fold compared to YYY Bank) : In 2003-12-12, embezzlement of 1 billion won occurred by the ... employee a CO branch.
...(Total profit is ...fold compared to YYY Bank) : In 2003-06-15, embezzlement of 2 billion won occurred ... ...employee a CO branch.

*Illustrative Only*

# 4.5 Application for Validation

## 1) RCSA Validation

- By comparing and analyzing RCSA impact evaluation result and KOREC Data, it validates RCSA performance result. : It reviews whether the total loss amount of actual KOREC Data is included in the RCSA impact evaluation result scope or not.

**Example**

KOREC Data      1st RCSA result impact in 2007 (Number of person)    Inclusion

| Bank | Date | Description | Total loss amount | BUC | ACT | Risk profile | 1 | 2 | 3 | 4 | 5 | Y/N |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| K Bank | 2007. 09.13 | Penalty payment to FSS due to misconduct of Bancassurance in guaranty | 10,000,000 | Agency sales of Bancassurance | Signature | There is possibility ... | 435 | 163 | 21 | 2 | 0 | ○ |
| S Bank | 2007. 07.06 | ... of labor Standard Law according to ... | 1,556,000,000 | Compensation payment | Calculation of compensation or retirement pay | There ... employee. | 486 | 46 | 76 | 8 | 2 | × |

※ In case the total loss amount of KOREC Data is not included in the scope of RCSA impact evaluation result and is underestimated, it encourages realistic evaluation with the following strategies :

① Adequacy review of risk profile description

② Retraining of employees for assessment method and criteria in case of risk assessment

5 : Seriousness, more than 500 billion
4 : Significance, 100–500 billion
3 : Medium, 10–100 billion
2 : Below medium, 1-10 billion
1 : Low, less than 1 billion
☐ : Impact level of actual loss amount
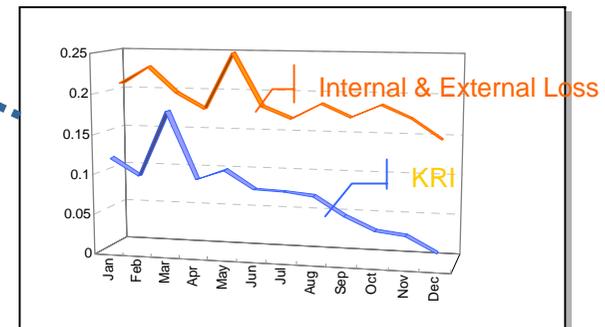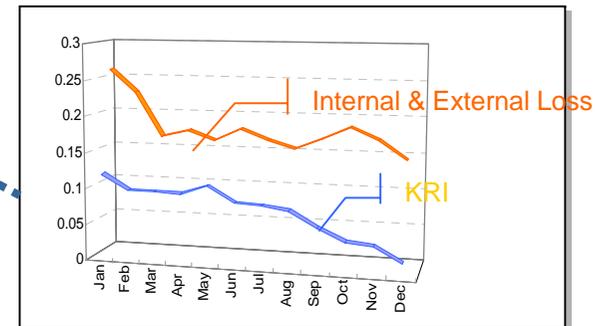
# 4.5  Application for Validation
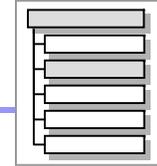
## 2) Used for KRI Validation Enhancement – Quantitative Approach

- RI is reviewed by comparison with frequency trend analysis or regression analysis of KOREC data to find whether the RI reflects actual loss status appropriately.
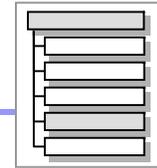
Internal · external loss data

KRI status in January, 2007

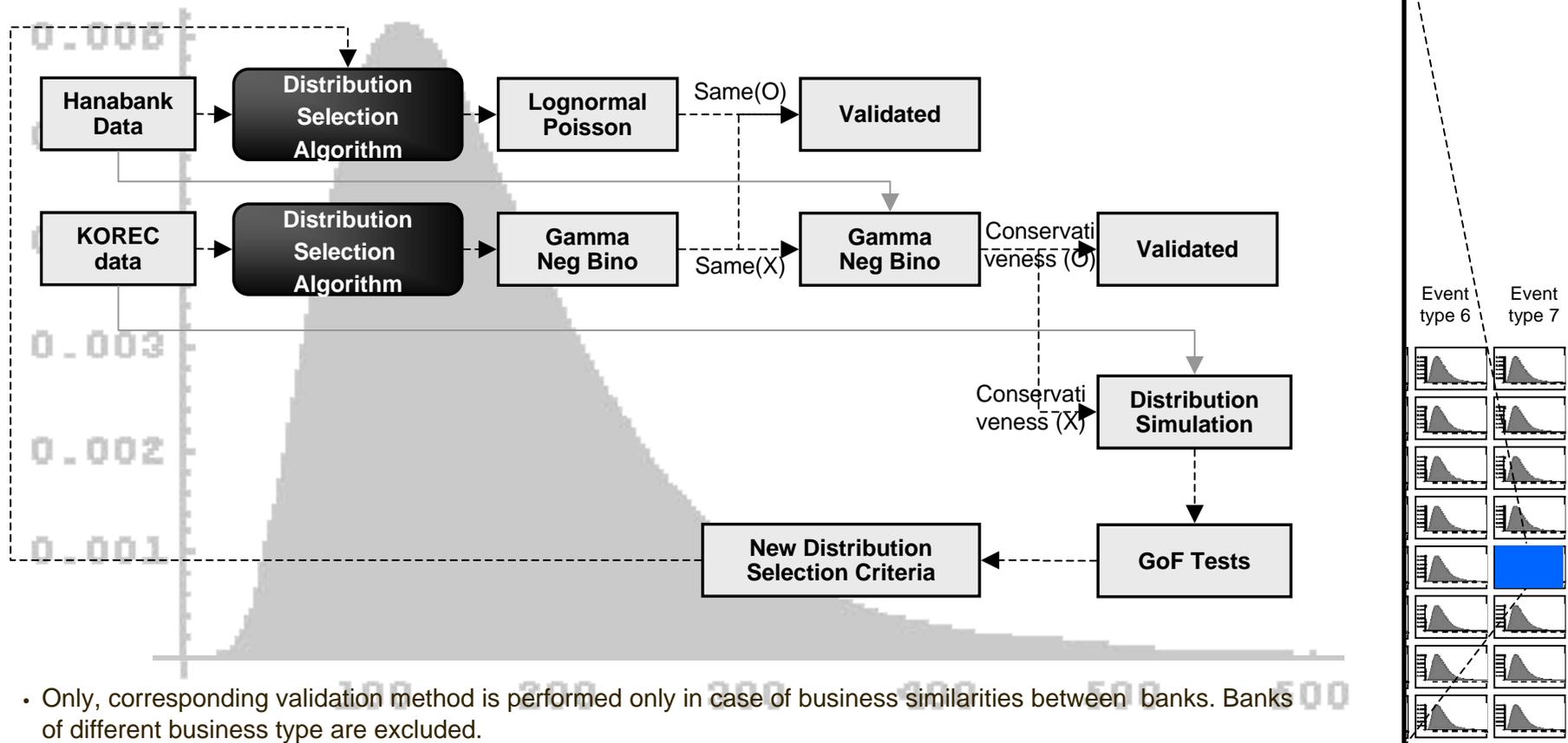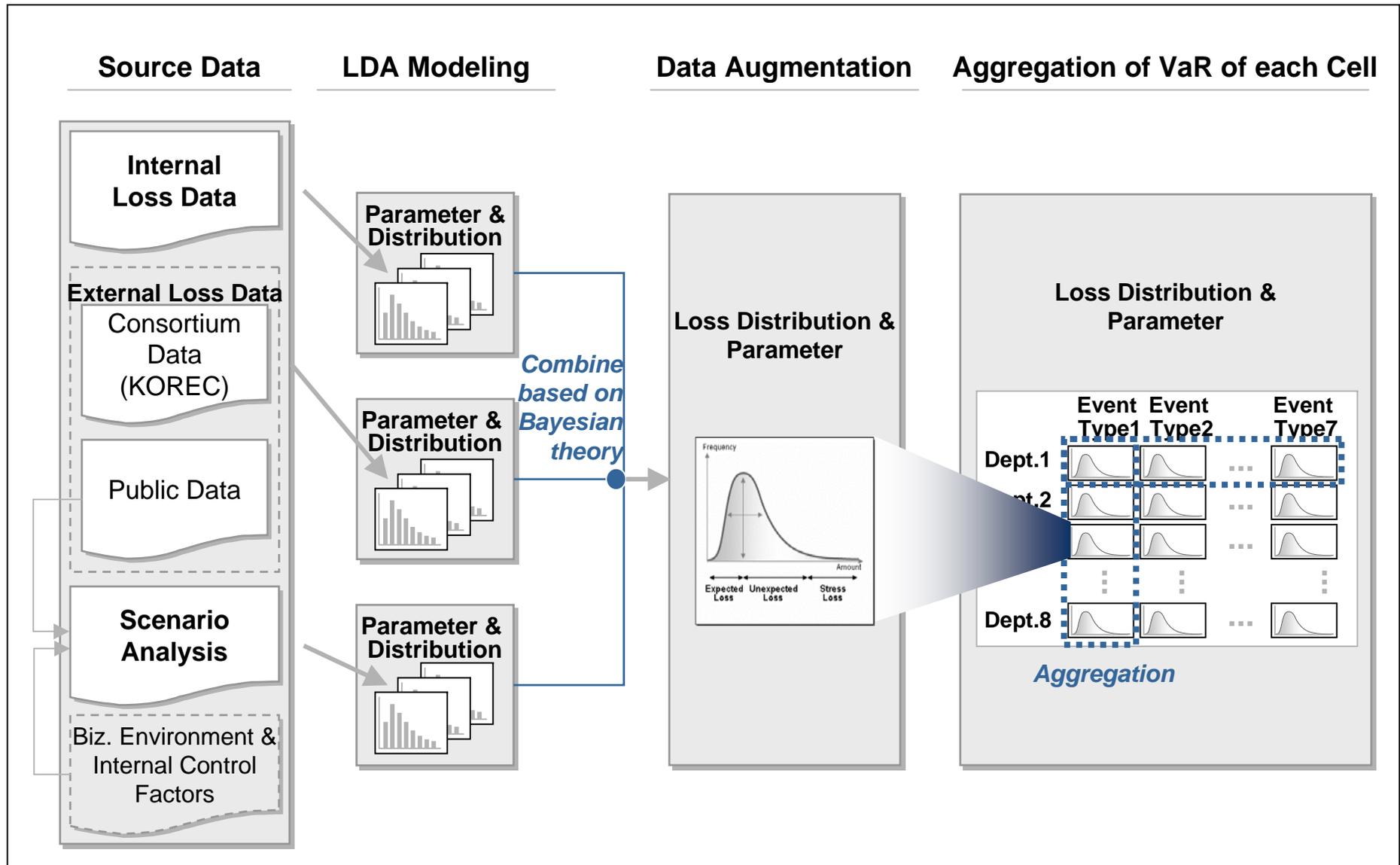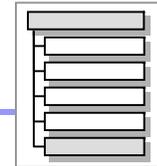## 3) Capital (VaR) Measurement Validation

- KOREC data are used for validation of capital(VaR) Measurement result by comparing and analyzing effects for distributions of each cell of KOREC loss data.

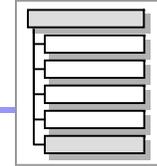Validation I : Validation of Distribution Selection Algorithm



- Only, corresponding validation method is performed only in case of business similarities between banks. Banks of different business type are excluded.
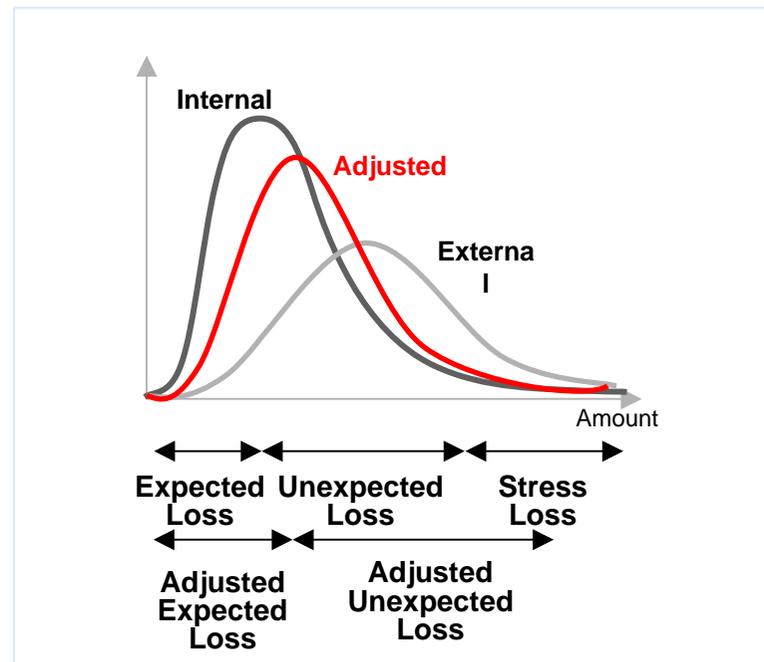
# 4.6 Application for Capital (VaR) Measurement



**Source Data**

**LDA Modeling**

**Data Augmentation**

**Aggregation of VaR of each Cell**

Internal Loss Data

External Loss Data
- Consortium Data (KOREC)
- Public Data

Scenario Analysis

Biz. Environment & Internal Control Factors

Parameter & Distribution

Parameter & Distribution

Parameter & Distribution

*Combine based on Bayesian theory*

Loss Distribution & Parameter

Frequency

Expected Loss | Unexpected Loss | Stress Loss

Amount

Loss Distribution & Parameter

| | Event Type1 | Event Type2 | | Event Type7 |
|---|---|---|---|---|
| Dept.1 | | | ... | |
| Dept.2 | | | ... | |
| | | | ... | |
| Dept.8 | | | ... | |

*Aggregation*

## Objective of LDA

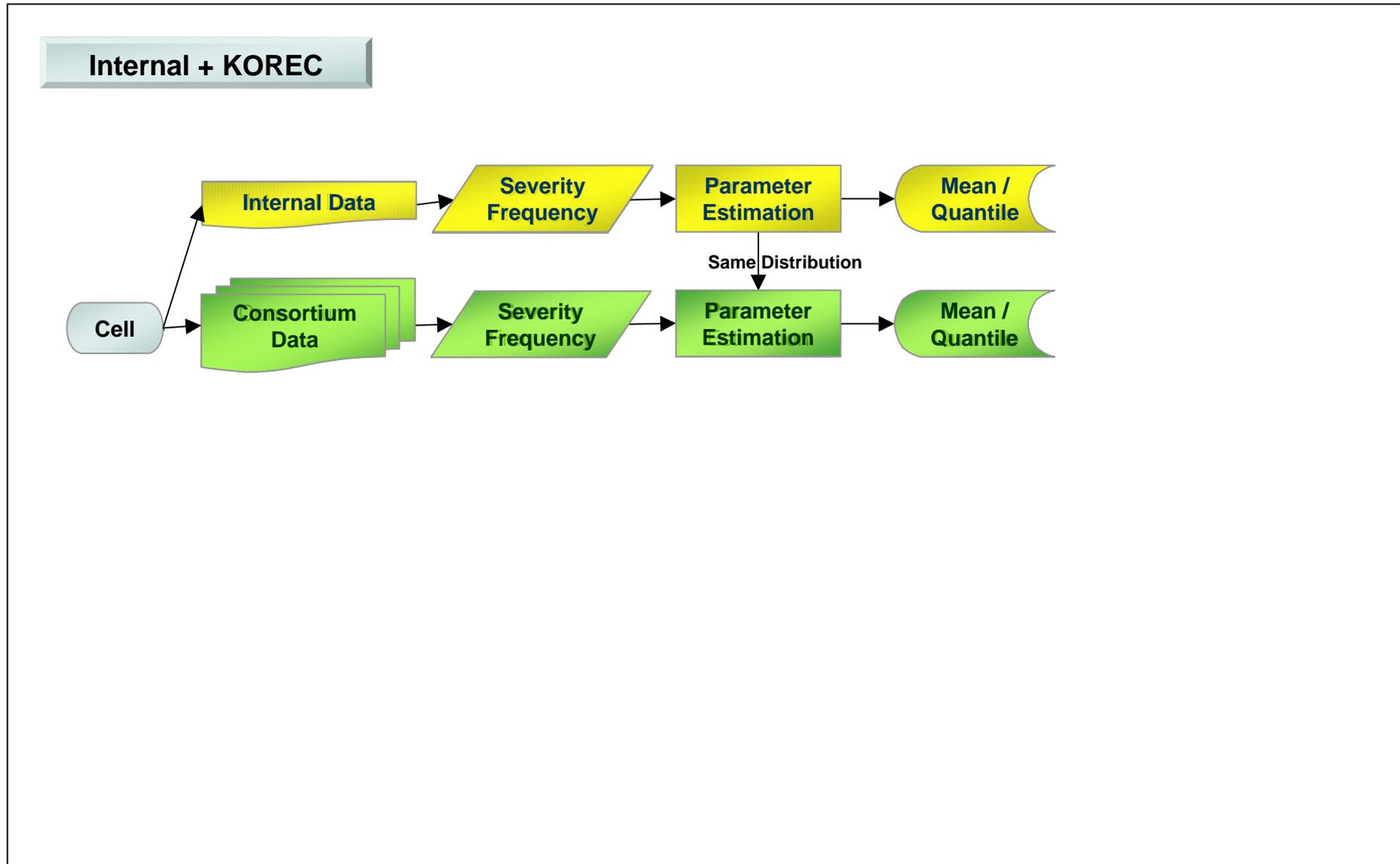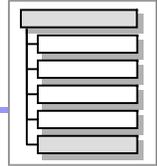- Augmentation of the insufficient internal loss data, especially for tail events

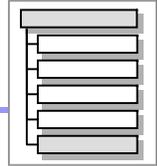- Qualitative adjustment of OP VaR

## LDA Modeling

Internal

**Adjusted**

External

Amount

Expected Loss   Unexpected Loss   Stress Loss

Adjusted Expected Loss   Adjusted Unexpected Loss

✓ Mean (frequency)  or mean and quantile (severity) are adjusted to reflect the impact of possible loss events that never occurred in the bank

**Internal + KOREC**

Cell

Internal Data → Severity Frequency → Parameter Estimation → Mean / Quantile

Same Distribution

Consortium Data → Severity Frequency → Parameter Estimation → Mean / Quantile

# 4.6 Application for Capital (VaR) Measurement

● **Integration with Internal Distribution**
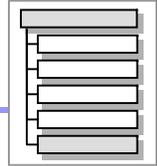
  ▪ **Weighted Average of Means and Quantiles**

  ➢ $m = \omega\, m_i + (1 - \omega)\, m_e$     $q = \omega\, q_i + (1 - \omega)\, q_e$
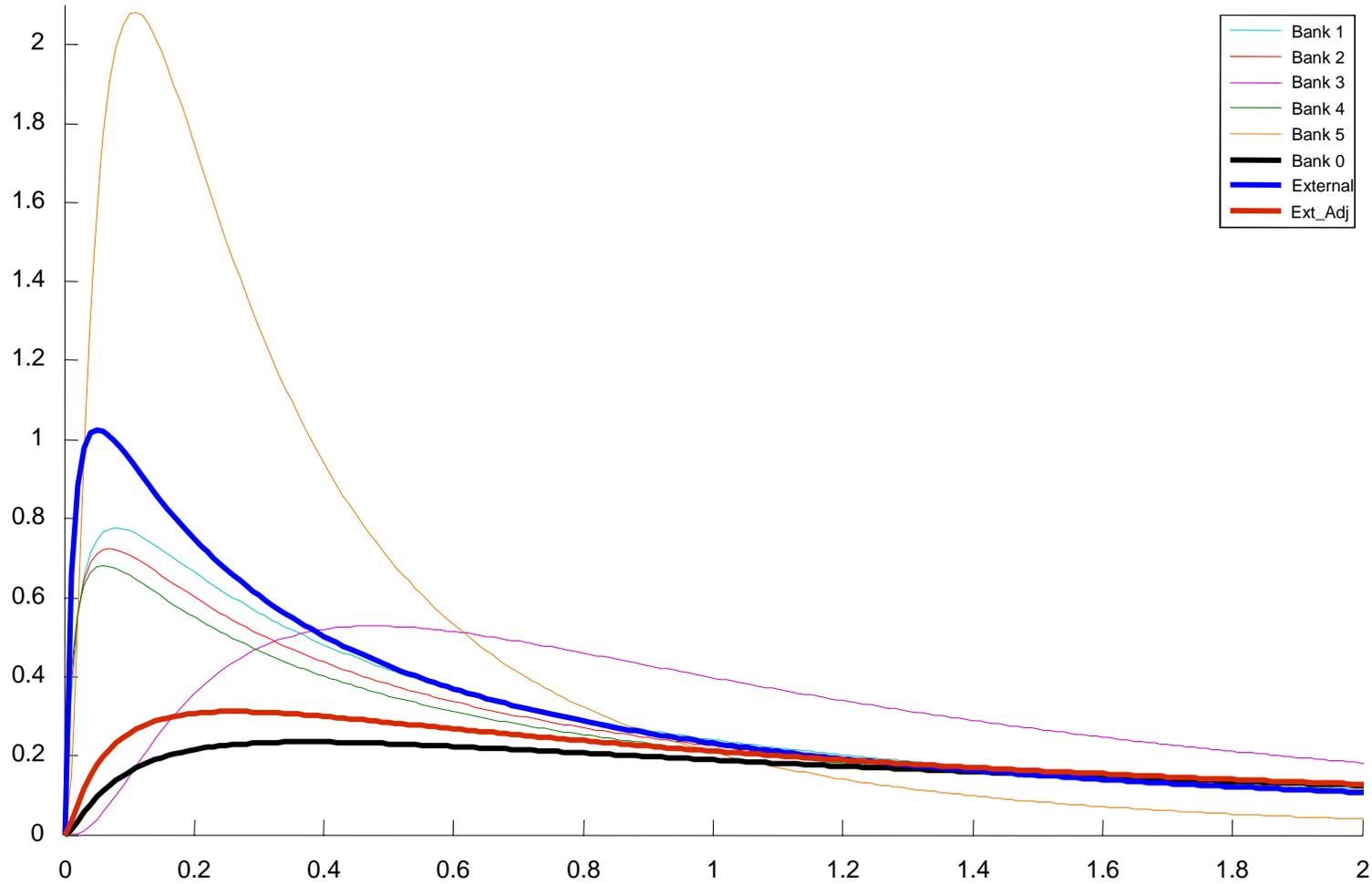
  ▪ **Weights**

  ➢ **Relative Importance of internal data over external data : <u>Credibility Function</u>**

# 4.6  Application for Capital (VaR) Measurement

## Internal + KOREC : Example ( Severity )

# Conclusion

| | |
|---|---|
| **1** | **Starting loss data consortium** |
| **2** | **Sharing issues between the FSS and banks** |
| **3** | **Continuously refining ORM system<br>for a more practical AMA implementation** |
| **4** | **Coordinating Roles & responsibilities with internal control teams** |
| **5** | **Raising the objective data weight for the measurement** |
| **6** | **Each bank needs to build up its own method<br>for the best advanced measurement.** |

**KOREC**

# *.Thank you for your time~*

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Hana Financial Group