

Operational Loss Data Collection & Analysis

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Agenda

- Internal Data
 - Range of Practice
 - Observations on Loss Frequency and Severity
 - Using Internal Data for Risk Management
 - Data Issues
- External Data
 - Range of Practice
 - Using External Data for Risk Management
 - Data Issues
 - Comparison with Internal Data

Recent Regulatory Exercises

- Quantitative Impact Study 4 (QIS-4)
 - Conducted by U.S. banking regulators on a voluntary basis for institutions with a presence in the U.S.
 - Objective was to understand likely effects of proposed Basel II capital standards.
- Loss Data Collection Exercise (LDCE)
 - Conducted concurrently with QIS-4.
 - Objectives were to better understand the QIS-4 OpRisk exposure estimates and the loss data on which these estimates were based.

Internal Data Range of Practice

- LDCE shows that progress is being made both in terms of data quantity and data quality.
 - 23 participants submitted 1.5 million losses totaling \$26 billion.
 - 13 participants had collected data at least as far back as 2001.
 - About half of the participants reported more than 1,000 losses.
 - 10 participants indicated their data were complete.

Internal Data Range of Practice

- Institutions have made considerable progress in developing loss data collection systems.
 - Dedicated operational loss databases or data extract from the general ledger
- Many institutions have or are in the process of establishing processes for the identification of loss events and database inclusion.
 - Aggregating multiple data points, identifying near misses, and capturing boundary events
- Institutions use, or map to, the seven Basel event type categories.

Data Collection Threshold

Loss Data Collection Thresholds Used by 2004 LDCE Participants

Loss Data Collection Threshold	Number of Participants
\$0 for most or all business lines	6
Less than or equal to \$1,000 (excluding \$0)	4
\$5,000 for all business lines	4
\$10,000 for all business lines	6
More than \$10,000 for some or all business lines	3
Total	23

- Little if any robust analysis to support the appropriateness of loss thresholds.

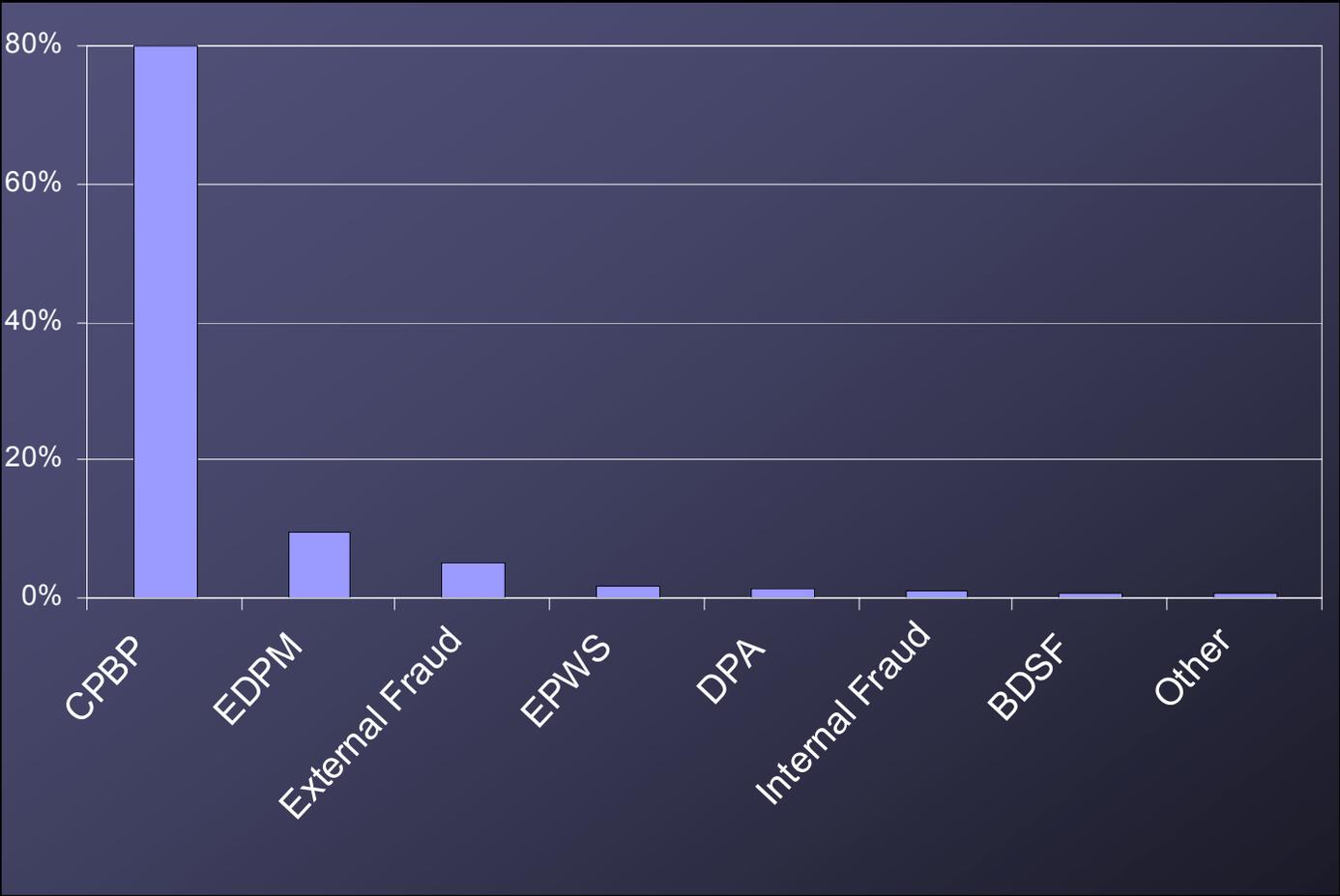
Number of LDCE Losses

Losses ≥ \$10,000 Occurring in Years When Data Capture Appears Stable (annualized)

	Internal Fraud	External Fraud	Empl. Practices & Workplace Safety	Clients, Products & Business Practices	Damage to Physical Assets	Bus. Disruption & System Failures	Execution, Delivery & Process Mgmt.	Other/Fraud	Total # Losses Per Year
Corporate Finance	1	2	11	14			23	8	59
Trading & Sales	4	3	30	36	6	44	1,204	9	1,335
Retail Banking	420	6,218	690	811	103	39	2,257	511	11,049
Commercial Bnkg	9	484	32	65	1	5	254	85	935
Paymnt & Settlemnt	96	81	32	7	2	10	549	43	820
Agency Services	1	6	7	57	2	26	830		929
Asset Management		47	19	25		7	335	16	449
Retail Brokerage	11	19	254	606		2	404	36	1,333
Other	76	305	322	73	22	4	634	27	1,462
All Business Lines	619	7,165	1,398	1,693	137	136	6,490	734	18,371

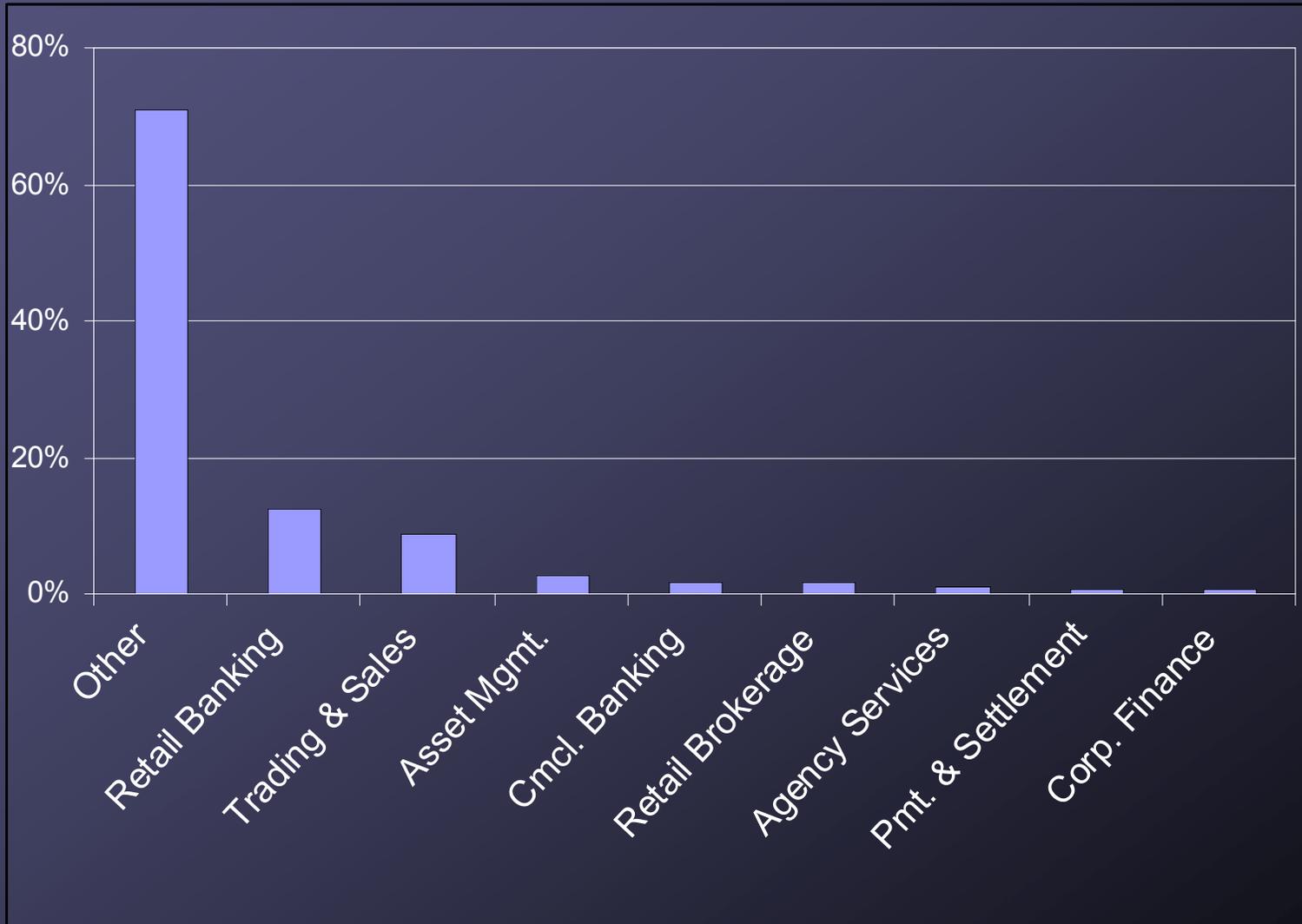
Note: Business line/event type combinations in red indicate more than 1,000 losses; those in yellow indicate less than 25 losses. Business line/event type combinations that are outlined indicate less than one loss per year. Total number of losses within a business line or event type may be subject to rounding error (see Appendix I for more detail).

LDCE Loss Severity by Event Type



CPBP denotes Clients, Products and Business Practices; EDPM denotes Execution, Delivery and Process Management; EPWS denotes Employment Practices and Workplace Safety; DPA denotes Damage to Physical Assets; and BDSF denotes Business Disruption and System Failures.

LDCE Loss Severity by Business Line



LDCE Loss Severity

<u>Event Type/Business Line</u>	<u># of losses</u>	<u>Loss Amount</u>
CPBP/Other	73	\$5.8 billion
CPBP/Trading & Sales	36	\$371 million
CPBP/Retail Banking	811	\$347 million
EDPM/Trading & Sales	1,204	\$239 million
External Fraud/Retail Banking	6,218	\$237 million
CPBP/Asset Management	25	\$181 million
External Fraud/Trading & Sales	3	\$101 million

Using Internal Data for Risk Management

- Risk Identification
- Largest Losses
- Repeating losses related to a particular business line, event type, or product
- Trend Analysis
- Reasonableness check for RCSA* results
- Reference in scenario analysis process
- Input into operational risk capital model

*Risk and Control Self-Assessments

Internal Data Issues

- Limited amount of data
- Treatment of legal losses
- Allocation of losses affecting multiple business lines
- Boundary Issues
 - Credit Risk
 - Market Risk
- Insurance Recoveries
 - Linking insurance recovery data to loss data
 - Lack of data

External Data Range of Practice

- Institutions are using external data, although sources and uses vary considerably.
- Sources most often observed were vendors and consortia.
 - Vendor databases include OpBase (Aon), OpRisk (SAS), and OpVar (Fitch)
 - Consortia include ORX (27 members from 12 countries) and ABA (8 U.S. banks)

Using External Data for Risk Management

- Risk Identification
- Comparison with internal data
- As an input to the scenario analysis process
- As a direct input to the operational risk capital model (to estimate tail)

External Data Issues

- Understanding the data
 - Estimated exposure vs. actual exposure
 - Grouping
 - Data quality
- Using the data
 - Selection
 - Scaling

Frequency Observations by Event Type

- Most LDCE losses occurred in
Execution, Delivery & Process Management
Clients, Products & Business Practices
- Most losses in external data occurred in
Clients, Products & Business Practices
- Two event types have very limited loss data in
both LDCE and external data:
Damage to Physical Assets
Business Disruption and System Failures

Frequency Observations by Business Line

- Most losses occurred in Retail Banking (for both LDCE data and external data)
- Fewest losses occurred in Payment & Settlement in external data.
- Fewest LDCE losses occurred in

Corporate Finance
Payment & Settlement
Asset Management

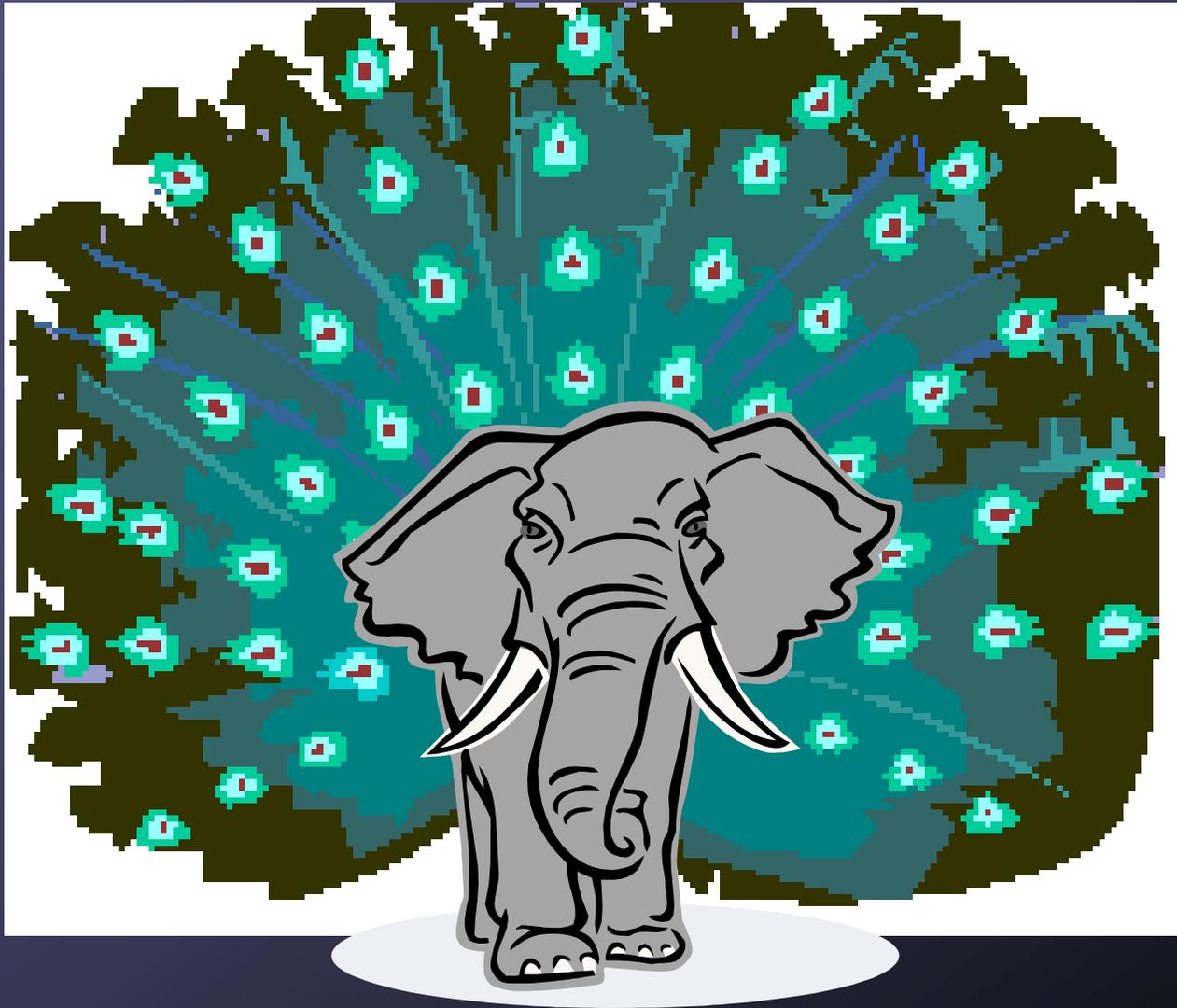
Losses \geq \$100 Million

- By event type
 - In the LDCE, > 80 percent of the total loss amount was in Clients, Products & Business Practices.
 - Results from external databases were similar.
- By business line
 - About half of those large losses in LDCE were attributed to “Other” rather than a specific business line.
 - Results from external databases differed.

What's Next?

- Understand your firm's loss experience
 - Where are your risks?
 - Where have you seen control failures?
- Understand the industry's loss experience
 - How does your loss experience compare with the industry's loss experience (benchmarking)?
 - Could a similar loss happen at your institution (scenario analysis)?
- Use data to improve risk management
 - Risk assessments, internal controls, trends
- Understand your legal risk!

Questions?



References

“Results of the Operational Risk Loss Data Collection Exercise (LDCE) and Quantitative Impact Study,” <http://www.bos.frb.org/bankinfo/qau/papers/pd051205.pdf>

“Summary Findings of the Fourth Quantitative Impact Study,” http://www.federalreserve.gov/BoardDocs/Press/bcreg/2006/20060224/qis4_attachment_revised.htm

Appendix I
Number of LDCE Losses, Annualized
Losses ≥ \$10,000 Occurring in Years When Data Capture Appears Stable

	Internal Fraud	External Fraud	Employment Practices & Workplace Safety	Clients, Products & Business Practices	Damage to Physical Assets	Business Disruption & System Failures	Execution, Delivery & Process Mgmt	Other	Fraud	Total
Corporate Finance	1.4	2.1	10.9	14.1	0.4		22.6	6.0	1.6	59.1
Trading & Sales	4.1	2.5	30.4	35.7	5.8	43.7	1,204.2		8.5	1,334.9
Retail Banking	419.8	6,218.3	690.2	810.5	103.1	39.2	2,256.7	126.3	385.0	11,049.1
Commercial Banking	8.5	484.1	31.5	65.4	1.4	5.2	254.2	4.0	80.6	934.9
Payment & Settlement	96.3	81.4	32.4	6.8	1.8	9.5	549.3	1.0	41.7	820.3
Agency Services	1.4	6.1	7.0	57.1	1.8	25.8	829.6			928.7
Asset Management	0.3	47.0	19.2	24.7	0.2	6.6	335.1		16.2	449.3
Retail Brokerage	11.0	19.0	254.4	606.2		1.8	404.1		36.4	1,333.1
Other	76.3	304.5	321.6	72.6	22.0	3.9	633.9	13.0	13.9	1,461.8
Total	619.2	7,164.9	1,397.7	1,693.2	136.5	135.6	6,489.7	150.4	583.9	18,371.1

Appendix II
Total LDCE Loss Amount (\$ Millions), Annualized
Losses ≥ \$10,000 Occurring in Years When Data Capture Appears Stable

	Internal Fraud	External Fraud	Employment Practices & Workplace Safety	Clients, Products & Business Practices	Damage to Physical Assets	Business Disruption & System Failures	Execution, Delivery & Process Mgmt	Other	Fraud	Total	Percent of Total
Corporate Finance	11.9	0.2	2.2	25.5	0.0		4.2	0.6	0.0	44.7	0.5%
Trading & Sales	8.5	100.9	4.3	370.9	0.3	5.0	238.8		12.9	741.6	8.6%
Retail Banking	35.9	237.3	75.3	346.8	8.8	17.8	316.2	5.6	22.8	1,066.4	12.3%
Commercial Banking	0.6	60.4	2.8	67.2	0.1	0.2	24.1	0.2	3.5	159.2	1.8%
Payment & Settlement	7.2	10.9	2.1	1.0	0.2	1.9	24.1	0.0	4.1	51.4	0.6%
Agency Services	1.3	0.8	1.6	5.5	0.7	1.5	85.5			97.0	1.1%
Asset Management	0.1	1.6	2.1	181.4	0.0	0.7	32.8		0.5	219.3	2.5%
Retail Brokerage	2.2	1.5	28.4	81.0		0.0	22.0		6.0	141.1	1.6%
Other	8.9	25.5	29.6	5,820.5	110.7	38.1	84.9	3.9	0.5	6,122.5	70.8%
Total	76.6	439.1	148.3	6,899.7	120.8	65.3	832.7	10.2	50.4	8,643.2	100.0%