

Operational Loss Data & Scenario Analysis

Conference on Operational Risk Management
Karachi, 7-8 February 2013



 **Health**

- When taking you on as a patient, your doctor wants to know your medical history
- Before writing a health policy, insurance companies want to know factors relevant to your health

Aviation

- Every incident – fatal or not – is investigated and results are published
- Near Misses must be reported by both pilots to the relevant authorities

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And the Financial Industry?

- Why bother collecting internal loss data?
- Why look at public loss information?
- Why consider benchmarking loss data?

- Doctors want to know your medical history to give you the right treatment
- Insurance companies want to know your medical history to assess their underwriting risk
- The aviation industry investigates incidents to learn from them and to improve air transportation safety

- *And banks are slowly learning*

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Systematically Collecting Internal Loss Data



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Internal loss data

- Internal loss data relate to losses suffered by a firm and are usually
 - proprietary confidential information of that firm
 - not revealed to the public
- Issues:
 - Identifying internal data sources
 - How to collect qualitative data
 - Data classification
 - Establishing the distribution

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Data sources

- Typically no volunteers
- The business may need some incentive to volunteer loss information, such as
 - Carrot and stick
 - No blame culture
 - Improved audit rating
 - Lower financial provisions
- Typically good sources:
 - Finance & Accounting
 - Operations
 - Audit findings
 - Customer complaints
 - Transaction reversals

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Learning from internal losses

- Primarily, the organization wants to be informed.
- Other than reporting, losses can be training material
 - Case studies make fine training material, but they happened in another firm and “cannot happen here”
 - Own events touch a nerve;
they happened right here under our very noses
 - To catch a thief, you must think like a thief.
If you’ve never seen fraud, you won’t recognize one.
 - Use own losses to your advantage to sharpen your staff’s awareness (but not before the case is closed and remediation has been completed)
- Establishing a loss distribution may show risk concentrations

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Training



- On 31 August 2012 a man was arrested in a branch of Cantonal Bank of Berne.
- Two weeks earlier the same man had robbed another branch in another town.
- Bank employees recognized him because the video of the robbery was used as training material for tellers.



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Finance and internal losses

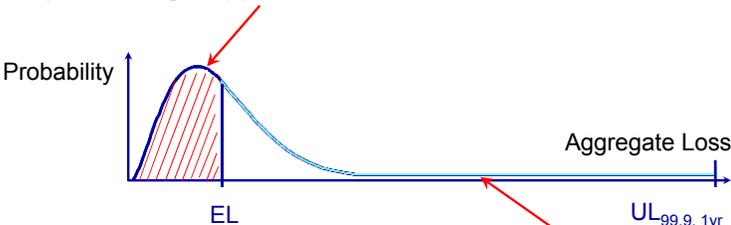
- Properly booked losses help the firm in many ways:
 - Performance measurement
 - Risk / reward assessment
 - Strategy reviews
- Most of a firm's internal losses are Expected Losses, cost of doing business, and serve
 - for budgeting
 - as capital relief
(capital is only required for unexpected losses)

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Internal losses

- Collecting loss data for statistical purposes allows predicting expected losses



- The part of the curve relating to unexpected losses cannot usually be covered by internal losses

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Data collection mechanism

- Depends on many factors
 - Commitment to loss data →
 - Staff cooperation →
 - Data availability / staff capability →
 - Chart of accounts →
 - Collection and reporting infrastructure →
- Depends on
 - Senior management support
 - Understanding
 - Transparency / staff training
 - MIS
 - Degree of automation

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Loss Data Capture






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Basics in collecting loss data

- Success factor #1 of all collection efforts: a good **Taxonomy**
 - Proper data classification in
 - Event categories
 - Business function
 - Causal factors
 - Contributing factors
 - Consistency
- Success factor #2: **Completeness**
- Success factor #3: **Accuracy**

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Record a new event

The screenshot shows a web browser window displaying the RiskBusiness Internal Loss Data Services interface. The page title is "RiskBusiness Internal Loss Data Services" with a sub-header "Add new loss event. Current Business Profile: RiskBusiness International 1 limited". The browser address bar shows the URL "https://subscriber.riskbusiness.com/Default.aspx?MainPage=HomePage.aspx".

The main content area is a form titled "Record a new event" with a "Summary" tab selected. The form contains the following fields and options:

- Descriptive information:** A text area containing "An armed robbery occurred in the ABC branch, with robbers posing as security guards from the cash collection company. Three people were shot in the process, with USD 1.5m cash being taken. Police".
- Organisation reference number:** A text input field containing "RB1012435".
- Start year:** A dropdown menu set to "2007".
- End year:** A dropdown menu set to "(None)".
- Occurrence date:** A date picker set to "11 / August / 2007".
- Status:** A dropdown menu set to "New".
- Checkboxes:**
 - Credit risk component
 - Market risk component
 - Identifiable

At the bottom of the page, there is a copyright notice "© 2005, 2006, 2007 RiskBusiness International Limited" and a "Terms and Conditions | Privacy Policy" link. The RiskBusiness logo is visible in the bottom right corner.

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Add date information

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Add risk/event classification information

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Add business activity information

The screenshot shows a web browser window displaying the 'RiskBusiness Internal Loss Data Services' interface. The page title is 'Add new loss event'. The 'Business Activity' tab is selected, showing a form with the following fields: 'Business line' (Retail Banking), 'Product' (Branch Operations), 'Originating business function' (Physical Security), and 'Detecting business function' (Physical Security). The browser's address bar shows the URL 'https://subscriber.riskbusiness.com/Default.aspx?MainPage=HomePage.aspx'. The Windows taskbar at the bottom shows the time as 18:52 and the date as 22-Jan-13. The RiskBusiness logo is visible in the bottom right corner.

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Location information

The screenshot shows the same web browser window, but with the 'Location' tab selected. The form fields are: 'Occurrence region' (Europe), 'Occurrence sub region' (Western Europe), 'Occurrence country' (Germany), and 'Occurrence city' (Frankfurt). The browser's address bar and Windows taskbar are identical to the previous screenshot. The RiskBusiness logo is visible in the bottom right corner.

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Amount information

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Completeness

- The big cultural issue: admitting and reporting losses
- To ensure cooperation, avoid pulling the rug from underneath people's feet!

- Education is the key
- Staff must see the benefit of reporting

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Accuracy

- Needless to say:
Inaccurate descriptions and numbers are useless
- Verify through random checks
- Compare KRIs and loss data to
 - spot inconsistencies
 - validate KRIs
- Reevaluate and redefine KRIs if necessary
- ... and keep working on that risk culture



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Loss Data Classification



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Who classifies events?

- Different organizations work differently
 - Central data capture and event classification
 - ♦ Business unit supplies description of the case with details as required
 - ♦ Central unit captures and classifies the event
 - ☞ consistent classification
 - ☞ heavy workload at central unit
 - Capture and classification at the source
 - ♦ Requires classification training/instructions
 - ☞ potentially inconsistent classification
 - ☞ distributed workload
- Use auto-classifier

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The classification framework

Business Function	Risk Categories				Business Lines			
	Processing ED & PM BD & SF	Conduct CP & BP EP & WS	IT & F	External ET & F DPA	1	2	3	etc
Origination								
Execution								
Processing & Operations								
Business Continuity								
Technology								
Finance								
Oversight								
Human Resources								
Corporate Services								

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Evolution of the framework

- For loss data analysis, the standard risk framework is not sufficiently granular
- Required is a common detailed risk classification structure
 - for which risk appetite can be set
 - where backward-looking data can be classified after the fact
 - which can be used to assess exposure before the fact
- Required are....**Detailed Risk Categories** (“DRC”) in a properly designed taxonomy

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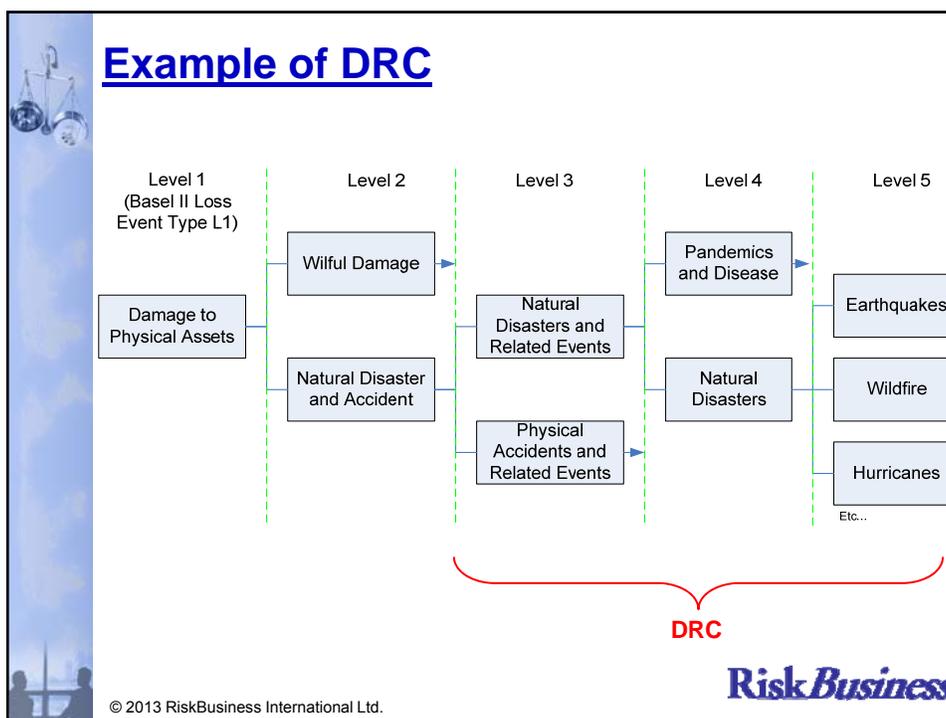


What are DRC?

- An extension of existing risk classification systems beyond level 1 and 2 to a comprehensive and unambiguous set of business oriented risk classifications at far lower level
- A mechanism using a common platform which can be used to
 - classify losses
 - assess exposures
 - analyze scenarios
 - attach indicators
 allowing the potential correlation of risk information

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Example: DRC as part of the Taxonomy

- DRC are part of the RiskBusiness Taxonomy, an online encyclopaedia covering:
 - Risk Categories (*L1 to Ln*)
 - Business Functions (*L1 to Ln*)
 - Business Lines (*L1 to Ln*)
 - Products and Services (*L1 to Ln*)
 - Scenario Types (*L1 to Ln*)
 - Control Types (*L1 to Ln*)
 - Causal Types (*L1 to Ln*)
 - External Event Types (*L1 to Ln*)
 - Direct Impact Types (*L1 to Ln*)
 - Indirect Impact Types (*L1 to Ln*)
 - Recovery Types (*L1 to Ln*)
- Each element contains name, description, conditions, qualifiers and key words
- Users can browse, search, select & use or download into their own framework

More info on www.riskbusiness.com

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Classifying operational risks

- It is important to use an unambiguous method of classifying operational risks, which can be used to
 - undertake effective risk assessments
 - uniquely classify loss events
 - correlate with indicator and loss information
- The use of DRC has immense power when used within a single firm, which increases when used across an industry.

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Using the Taxonomy

- The Taxonomy should allow you to query the built-in encyclopedia by using common key words
 - e.g. enter the term “physical theft” and be provided with a structure representing the potential classification for that event
- Qualifiers must assist in ensuring a single, unambiguous classification for that event, as illustrated in the next slide
- Search or browse for the possible DRC and, based on the qualifiers, select the most appropriate way to classify that event

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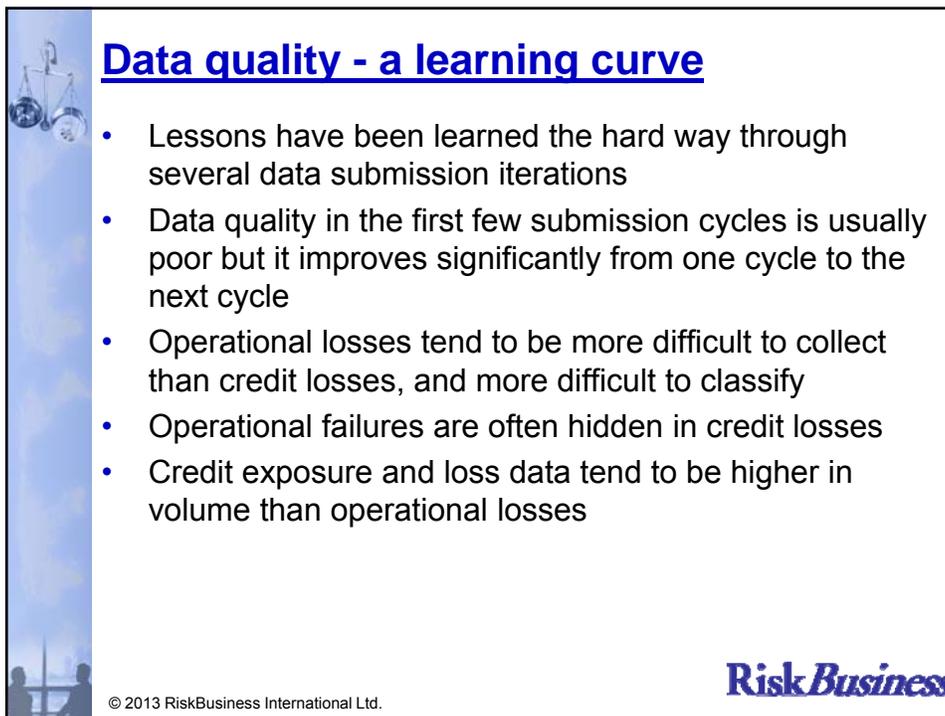
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Data Quality and its Impact on Operational Risk



Data quality - a learning curve

- Lessons have been learned the hard way through several data submission iterations
- Data quality in the first few submission cycles is usually poor but it improves significantly from one cycle to the next cycle
- Operational losses tend to be more difficult to collect than credit losses, and more difficult to classify
- Operational failures are often hidden in credit losses
- Credit exposure and loss data tend to be higher in volume than operational losses





Identifying bad data

- Primary identification by the data supplier
- Automated plausibility check where possible (tolerance bands)
- Pattern breach alarm
- Comparison to indicator data where possible
- Consistency check with financial accounts
- Data analysis by a brain
- Have Internal Audit check data submissions in their routine audits

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Dealing with poor data quality

- Set a reasonable reporting threshold
- Draw the data supplier's notice to the poor quality
 - Be patient (for a short while), your data quality will improve over time
 - Make the supplier understand the value of the data
 - Assist in finding the bug or alternate data sources if necessary
 - Escalate the problem if supplier is uncooperative and if data are important enough to justify a conflict
- At all times, maintain credibility

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Impact of poor data quality

- Sound management depends on quality information
- Poor data quality is worse than no information
- Data may be used for MIS purposes, impacting
 - Performance measurement
 - Risk measurement and management
 - Scenarios and their output
 - Business planning
 - Strategic decisions

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External Data



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Loss information

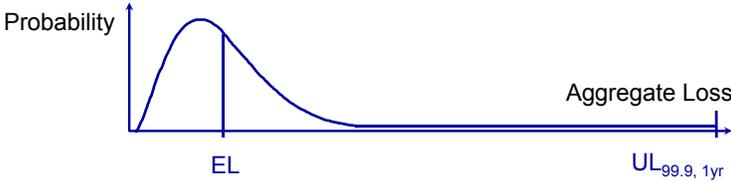
- A sound risk management framework does not only relate to a bank's ability to keep records of **internal loss data**; it also requires access to comprehensive and relevant **external loss data**
- External loss data have two forms:
 - Public loss data, derived from public information by research
 - Pooled or consortium loss data, provided by participants for mutual use

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Public loss data

- Public losses are publicly revealed events suffered by a firm, usually published in newspapers, legal findings and other public records
- Collecting external loss data allows completing the shape of the curve



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Common uses of public loss data

- Training, Education
- Development and/or refinement of key risk indicators
- Scenario analysis
- Completeness check for capital models

- Public data are used to
 - better understand the risk profile
 - determine whether some specific type of risk could affect the firm

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Example: Rogue trading

- 1995: Nick Leeson rocked the financial world
- Probably every bank in the world looked at their trading floor and back-office processes
- Most banks concluded that an incident like at Barings could not happen with them

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Could it happen again?

- ***“We are different, we have controls”***
 - Deutsche Morgan Grenfell – USD 646m (1995-1997)
 - Sumitomo Corporation – USD 2857m (1985-1999)
 - Allied Irish Bank – AllFirst – USD 691m (1997-2002)
 - UBS – USD 2600m (2012)
 - JPMorgan Chase – USD 6200m (2012)
- ***“Rogue trading typically happens far away from head office, where controls are more relaxed”***
 - Showa Shell Sekiyu – JPY 165 billion (1988-1993)
 - Daiwa Bank – USD 1100m (1988-1995)
 - WGZ Bank – USD 230m (1998)
 - Riječka Banka – USD 98m (2002)
 - National Australia Bank – AUD 360m (2003-2004)
 - Société Générale – EUR 4.7 billion (2005-2008)
 - MF Global – 141m (2007-2008)

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Gaining insight with public loss data

- Augment a firm's own internal loss data in areas where that firm has either
 - no data of its own
 - insufficient data
 to make properly informed decisions
- This is of specific assistance
 - when entering into new markets or services
 - for scenario evaluations
 - for ICAAP assessments

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Public loss data as an input for scenarios

- Serve as input into a loss distribution model which may be used to
 - calculate economic or regulatory capital requirements
 - test the validity of calculated capital numbers under different scenarios

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Uses for scenarios -1

- **Risk Management:**
 - Evaluation of exposure to risks and/or effectiveness of controls under specific conditions
 - ♦ General risk management
 - ♦ Supporting risk and control assessment
 - Risk Transfer/Mitigation
 - Crisis and Business Continuity Management
 - Training and Education

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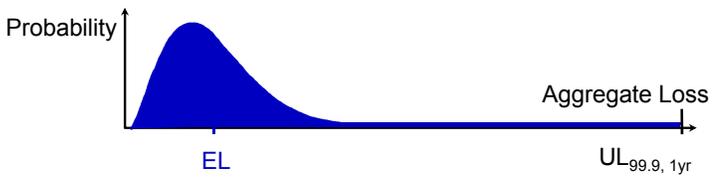
Uses for scenarios -2

- Risk **Measurement**:
 - Calculation of Economic or Regulatory Capital Requirements
 - Economic Capital (99.9% confidence level, 1 year time horizon)
 - Expected Loss
 - Unexpected Loss for worst 1 year in 10 (UL_{10})
 - Other percentiles of the loss distribution where necessary
 - Effects of insurance on capital (for cost / benefit analysis)

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Create unique loss distribution



- The shape of the distribution is totally dependent on the business profile of the firm – the unique blend of strategy, culture, geographic sphere and business objectives create the distribution
- Only scenarios can reasonably represent this uniqueness in a risk/capital measurement model

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Loss distribution / qualitative adjustments

- Losses provide management with an immediate incentive to make changes to prevent reoccurrence of similar events
- A pure loss distribution model would predict a large increase in capital following an event, although qualitative adjustments could reduce this
- Scenarios would incorporate such adjustments in the discussion with business management, and provide increased transparency around the capital calculation and allocation process
- The use of scenarios can enhance management's engagement to develop a more strategic forward view for investment budgeting purposes over the medium term, even in the absence of specific losses to the firm

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Loss data and capital

- Some organizations believe that loss data are more objective as a measure of risk, and therefore a basis for risk capital calculation.
(includes The Federal Reserve Bank of New York)
- Others believe that the context dependency, and the fact that history tends not to repeat itself (particularly if controls are improved) actually destroy some of the value that loss data purport to offer, and therefore scenarios can offer a more accurate estimation.
(includes the majority of non-US regulators)

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A hybrid approach to capital calculation

- Internal data can be used to develop the body of the loss distribution
- Data generated from scenario analysis are used to fill any gaps in these data, as well as to drive modelling of the tail of the distribution
- Loss data can be used to determine loss frequency, scenario data to determine loss severity
- External loss data may serve as a guide to determine potential severity

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Problems with public loss data

- Reported incidents rely on public sources of information, i.e. will always be subject to the sources
- A publicly reported loss contains the reporter's bias and opinions on potentially incomplete facts
- A publicly reported loss may be incorrect, particularly the size of the impact
- Lost in Translation: different story in different languages
- Not necessarily relevant

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Problems with public loss databases

- In addition to the basic problems with publicly available incident reports,
 - Public databases will always be incomplete
 - Inconsistent classification may cause incorrect analysis of resulting data points
 - many different sources
 - reliance on different analyst interpretations
 - A reasonably comprehensive and complete database takes enormous effort to create and maintain

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Loss Data Sharing



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Consortium loss data

- A lot of data points are required to firm up the shape of the loss distribution curve
- Given the lack of a large enough number of internal data and the shortcomings of public loss data, consortium loss data appear the most rewarding solution
- How does it work?
 - A number of firms agree, under specific rules, terms and conditions to contribute their internal loss data on a secure and anonymous basis into a pool
 - Members of the consortium can use the resultant (anonymous) data for their own individual internal purposes

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Focus of data consortia

- In financial services, data consortia tend to focus on:
 - Data relating to losses suffered by a firm, either due to operational causes or credit defaults
 - Data relating to possible credit defaults, credit exposures or operational exposures
 - Data relating to credit quality
 - Data on near misses

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Benefits of consortium loss data

- In contrast to public loss data, a loss data consortium is a voluntary association of firms who are all
 - prepared to contribute their own data into a pool so as to gain the benefits of having access to a greater source of (anonymous) data than they would have internally
 - collecting their own data already, which implies
 - ♦ far lower effort
 - ♦ consistent classification
 - ♦ much better completeness (provided that no participant withholds data)

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Benefits of a local vs. global consortium

- Far more relevant than foreign external data
- Statistically more complete than data derived from public sources
- Data tend to be more homogeneous, mainly because of similar business mix, business environment and business volumes
- Data quality is under consortium members' control
- Can meet the specific needs and requirements of consortium members (data categorisation issues, anonymity issues, scaling issues,...)
- Benefits can be derived in other spheres as well, e.g.
 - pricing of fair value for insurance
 - securing better insurance cover at lower cost

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Loss data consortia currently in operation

- GOLD – the oldest consortium, managed by BBA as of Sep 2010, RiskBusiness is the service provider
- ORX – formed by large banks
- Indonesia – encouraged by Bank Indonesia, managed by LPPI. RiskBusiness is the service provider
- Local bank-driven consortia (e.g. Italy, Hungary, Germany, Korea, South Africa)
- Small consortium in USA, managed by ABA
- ORIC – insurance loss data consortium in London RiskBusiness is the service provider

For more information on joining GOLD or setting up a consortium in your country please contact hansruedi.schuetter@riskbusiness.com



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Scaling



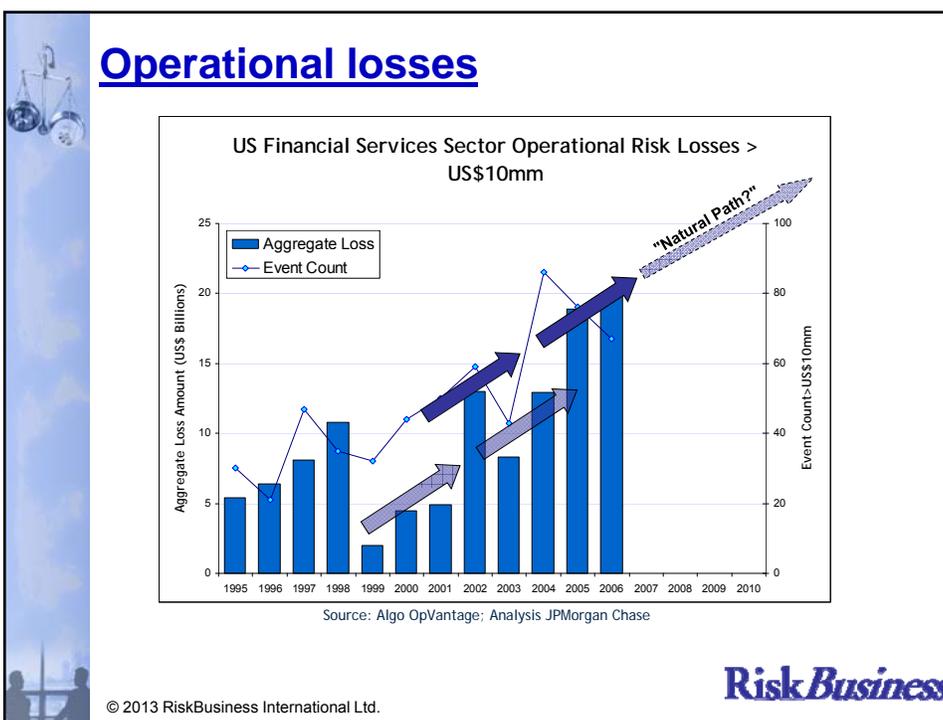
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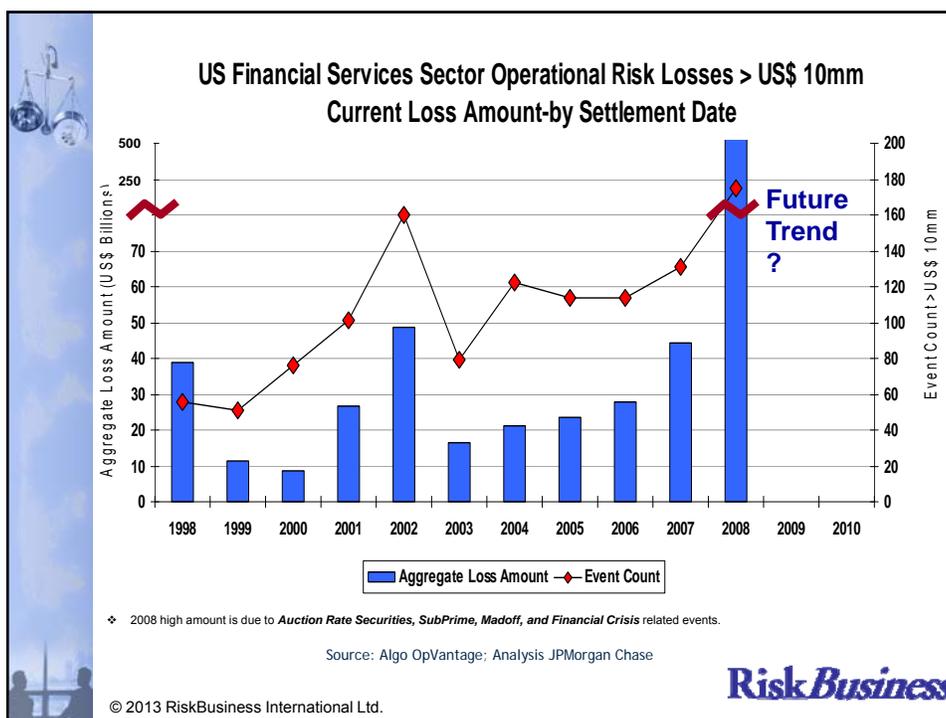
Comparability issues

- Are events of one contributor relevant for our organization?
- Anonymized peer data must nonetheless be classifiable, e.g. by
 - Balance sheet size
 - Business line activity
 - Geographic occurrence
 - etc.
- Such disclosures dilute the anonymity again to a certain degree

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Comparability over time

- Operational losses appear to grow year after year
- Is there a need to revalue older loss data, just like some sort of “inflation adjustment”?
- Example:
 - In 1977, Credit Suisse was on the brink of bankruptcy over a CHF 2 billion internal fraud
 - Today, 2 billion hurt, but won't kill anymore
- Can we find a reasonable “inflation adjustor”?

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Scaling historic parameters

- Robert Korona advocates not to scale operational loss data but to scale the value of parameters describing the operational environment.
- Example: Payment failures
 - Rather than scaling the historic transaction size, scale the total historic payments volume
 - The number of huge settlements should be more or less constant during the different periods.
 - Calculating the average value of settlements for each period and the standard deviation for these periods will permit to rescale this data.

Source:
Robert Korona, PKO Bank Polski

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Contact Details



Hansruedi Schütter
Executive Director Europe, Asia and Middle East

Telephone	+41 - 76 - 558 7632
Skype	schuetter
LinkedIn	Hansruedi Schuetter
E-mail	hansruedi.schuetter@riskbusiness.com
URL	www.riskbusiness.com / www.kriex.org

RiskBusiness is a specialist advisory services firm with focus on operational risk within the broader enterprise risk environment. It comprises exclusively of leading ex-practitioners focused on sharing their experiences with its clients.

The RiskBusiness **Internal Loss Data Collection Tool** allows clients to get a comprehensive, properly classified overview of their events.

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