

# Vessel & Port Aggregation

Copenhagen

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# Vessel & Port Aggregation Exposure

This presentation is a follow-up and expansion of Matthias Kirchner's presentation in Tokyo on Vessel aggregation exposures

- Summarizes the core issue addressed
- Highlights related port aggregation exposures
- Reviews current top-down measurement approaches in light of actual data
- Identifies an alternate bottom-up analytical approach that can offer improved accuracy
- Offers direction to move forward

## Critical Issues

- Without access to real-time shipment information, underwriters do not know their actual aggregate exposure on any single container vessel or in any port
- As vessel sizes and cargo values increase, and with new regulations, this exposure becomes a solvency issue
- No scientific method of monitoring the sufficiency of reinsurance currently exists

**The problem is growing!!**

## Current Top-Down Estimation Method

- Determine the average container exposure
- Multiply by the maximum number of containers likely to be exposed to a single incident
  - 12-15,000 TEU's on a single vessel
    - Double for a collision of 2 vessels
  - Port turnover / 300 days \* 3 days avg stay
    - 200-250K TEU – Asian ports
    - 150K TEU – LA/Long Beach
    - 50-100K TEU – European ports
    - Adjust for seasonality
- Multiply by insurer market share

# Inherent Problems with Current Methods

- Average Container Value assumptions
  - Widely different estimates
  - No weight given to commodity & route differences
  - No variance analysis
- Market share assumptions
  - Can vary widely by port, route and commodity
  - Client exposure profiles not usually taken into account
- Port estimates do not take warehouse exposure into account though they are subject to the same catastrophe risks
- Ports have different turnover times, seasonality factors (50-300%) and exposure values

## **Oceanwide Actual Container Values**

Data collected and scrubbed from selected Oceanwide software users

- 200,000 shipments during 2006
- 250,000+ containers
- Primarily certificated shipments
- Containerized shipments only
- Majority US exports

## Oceanwide Actual Container Values

<i>Commodity</i>	<i>Average Value</i>
All	\$22,634
Metals	\$36,170
Machinery & Equipment	\$69,953
Apparel	\$10,940
Perishables	\$20,472
Electronics	\$76,414
Chemicals	\$32,374
General Merchandise	\$17,050

## Oceanwide Actual Container Values

<i>Commodity</i>	<i>Average Value</i>	<i><u>Standard Deviation</u></i>
All	\$22,634	\$87,061
Metals	\$36,170	\$72,936
Machinery & Equipment	\$69,953	\$162,528
Apparel	\$10,940	\$8,858
Perishables	\$20,472	\$20,540
Electronics	\$76,414	\$118,090
Chemicals	\$32,374	\$94,723
General Merchandise	\$17,050	\$85,412





## Oceanwide Actual Container Values

<i>Route</i>	<i>Average Value</i>	<i>Standard Deviation</i>
North America – Asia	\$17,795	\$102,163
North America - Europe	\$28,480	\$76,081
Europe - Asia	\$21,663	\$89,863
Europe – North America	\$26,424	\$55,020
Asia – North America	\$30,477	\$41,517

## Oceanwide Actual Container Values

<i>Route</i>	<i>Average Value</i>	<i>Standard Deviation</i>
North America – Asia	\$17,795	\$102,163
North America - Europe	\$28,480	\$76,081
Europe - Asia	\$21,663	\$89,863
Europe – North America	\$26,424	\$55,020
Asia – North America	\$30,477	\$41,517
USA – China	\$10,840	\$64,077
USA – Japan	\$77,144	\$301,929
USA - Australia	\$22,065	\$51,267

## Conclusions Based on Shipment Data

- Average values are \$20,000 - \$80,000
- Usefulness of these averages is suspect due to substantial statistical variances
  - By commodity
  - By route
- Current reinsurance coverage sufficiency and accuracy is ***almost*** pure chance
  - Extremely conservative estimates required
  - Poor transparency into true exposures

## Alternate Bottom Up Analysis Method

- Capture more detailed client exposure profiles
  - Review actual shipments - not only claims
  - Profile port usage and carriers
- Capture & analyze actual shipment data
- Determine % of total exposures reported
  - $\text{Sum of declared values} / \text{Annual turnover}$
  - Break down by commodity and route where applicable
- Extrapolate using client profile to estimate aggregate vessel and port exposures
- Aggregate across the portfolio

## **Impact Of the Alternate Method**

- Validation of existing estimation methods
- More accurate reinsurance purchase
- Better information to guide portfolio balance
- As the % of actual shipment data increases:
  - Will likely indicate that there are many more shipments and bigger exposure than expected
    - More premium or lower rates
  - True commodity & route based claims ratios will improve underwriting transparency and efficiency
  - Real-time alerts can be implemented

## How Can We Capture Shipment Data ?

- Most of your clients now use software to manage supply chain and freight logistics
- Shipment data is currently transmitted to Customs for 24-hour rule compliance
- Forwarders & Carriers also store shipment data
- ACORD is finalizing a standard for the reporting of detailed shipment data -> Oceanwide & other Logistics software vendors will adopt it
- Web services, XML & the Internet have simplified and reduced the cost of integration

***The Data Is Now Available***

## **Will Shippers & Brokers Provide It?**

If insurers demonstrate the benefits

- Improved risk management by analyzing loss ratios by country, port, carrier, etc.
- Rates matched to true long-term exposures
- Results compared to industry-specific benchmarks to target areas for improvement
- Verified adherence to conveyance limits
- Reduced risk of supply-chain bottlenecks
- Improved program & retention planning
- Streamlined processing of retained claims

## **Will Shippers & Brokers Provide It?**

If insurers assume the costs

- IT costs for integration
- Internal underwriting process re-engineering
- Some incentives to shippers for the administrative costs
  - Discounts to reflect reduced reinsurance costs
  - Risk management / benchmark reports

**If insurers insist!!!!**



## **Call To Action For Underwriters**

Take advantage of this opportunity

- Highlight the issue to senior management
  - Implications on reinsurance & solvency
  - Need for IT system upgrades to capture & analyze shipment and client profile data
  - Potential market differentiator
- Support the ACORD standard initiative
- Promote integration benefits with brokers, clients and re-insurers, offering incentives if necessary

**The timing is right!!**

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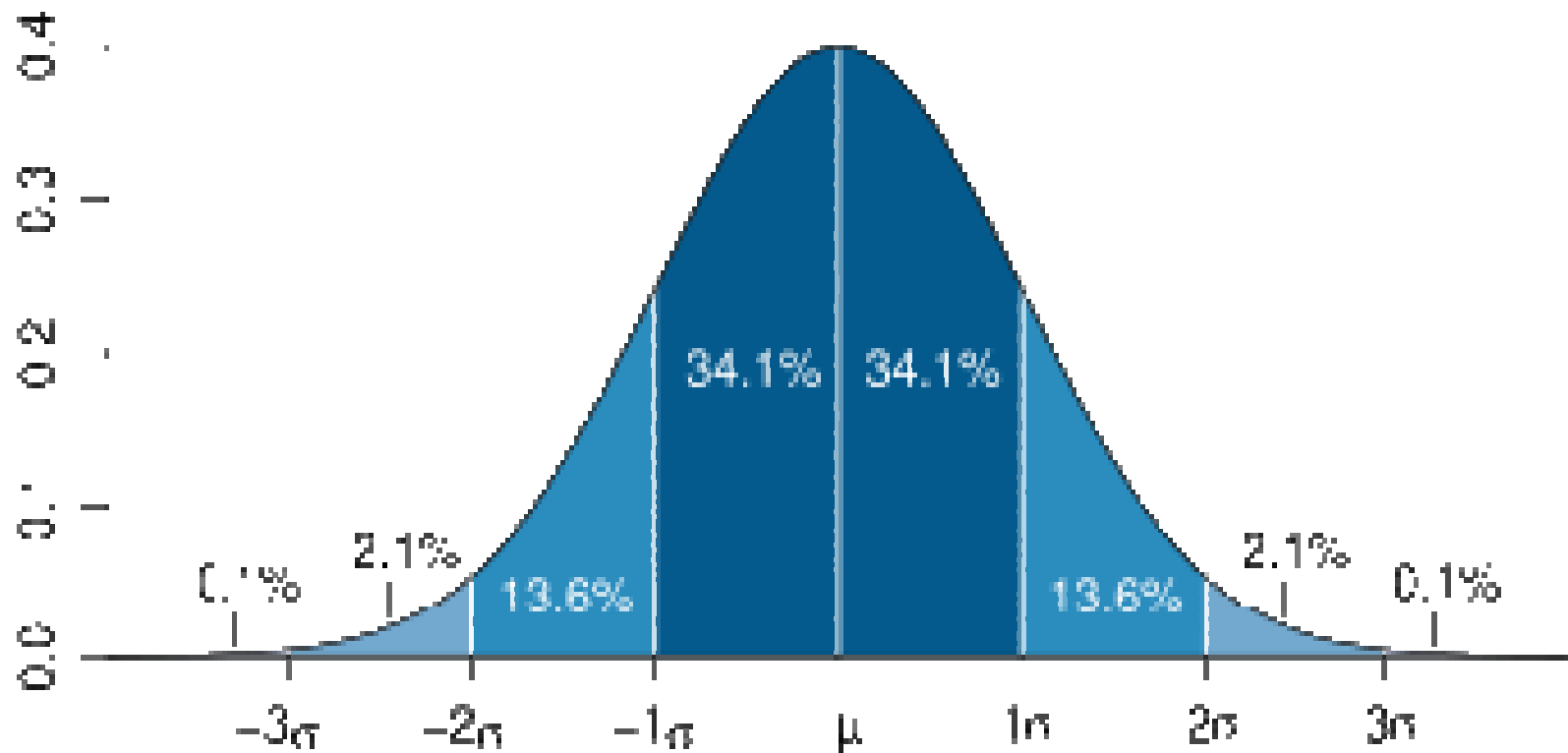
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## Average Container Value Analysis

Source	Average Value
Matthew O'Sullivan – 2006 IUMI presentation	\$80,000 - \$210,000
Munich Re: Estimate	\$80,000 - \$100,000
XL Re Studies	\$35,000 - \$120,000
Hyundai Fortune (Multiple sources)	\$204,000 - \$300,000
MSC Carla (US Reinsurer Results)	\$74,000
APL China (US Reinsurer Results)	\$211,000



## Normal Distribution Curve



# Inverse Chi Square Distribution Curve

