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BI / CBI following NatCat


Where to go next?

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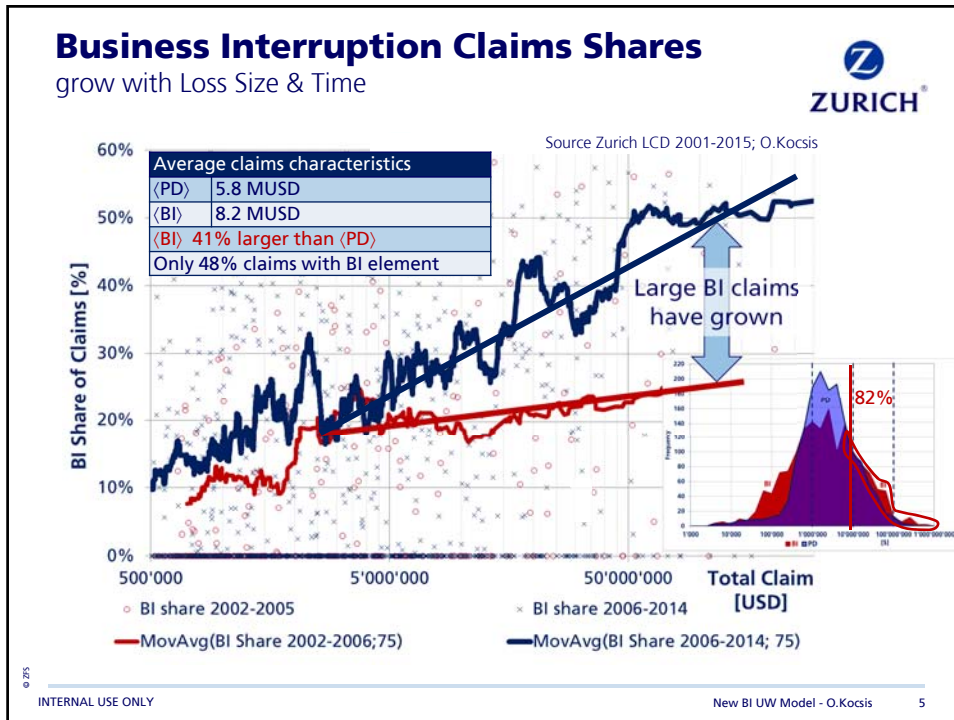
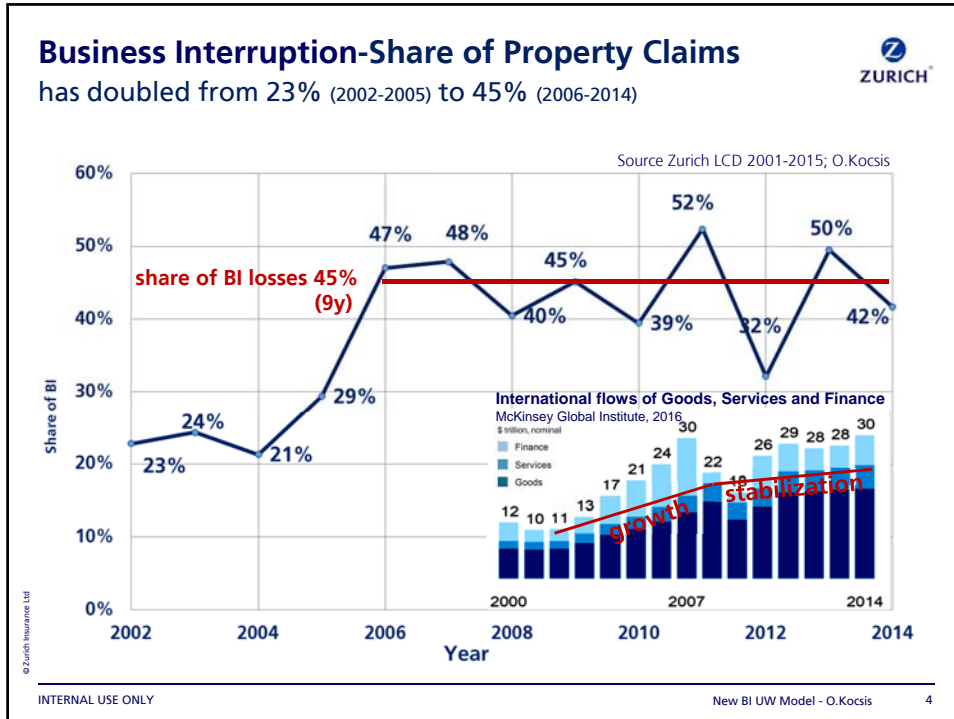
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BI / CBI following NatCat - Where to go next?

Overview  ZURICH®

- 1. BI claims data** analysis
- 2. BI Risk Assessment** – Interdependencies
- 3. Modelling BI** – top down – bottom-up

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Business Interruption Exposure of Industries

Exposed & lesser exposed industries

Industry sector	BI-share	Industry sector	BI-share
Mining	81%	Wholesale	34%
Oil & Gas	72%	Healthcare	31%
Automotive	59%	Hospitality, Sports & Leisure	31%
Chemicals (Paint, Rubber)	59%	Food & Beverage	31%
Electronics	57%	Environmental	27%
Industrial Metals	53%	Retail	21%
Printing & Laboratories	53%	Professional Services	20%
Utilities	51%	Education	19%
Aerospace & Defense	45%	Transportation	18%
Power & Electricity	45%	Construction	15%
Plastic, Glass	44%	Services	13%
Pharmaceutical & Biotech	43%	Telecommunication	10%
Paper	42%	Real Estate	5%
Consumer Products	38%	Municipalities & Government	2%
Entertainment & Media	37%	Banking / Insurance	0%

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BI Recovery Times from 400 biggest BI losses

The average **recovery time** of all analyzed BI claims is **9 months**.

Industry	«Recovery Time» [mts]	Max Recovery Time [mts]
Technology	13.5	33
Aerospace & Defense	12.0	16
Transportation	10.8	18
Environmental	10.5	15
Gen. Ind. Glass Metals	10.4	24
Food & Beverage	10.3	18
Wholesale	10.0	15
Retail	9.4	15
Automotive	9.3	18
Consumer Products	9.1	20
Telecommunication	9.0	9
Mining	8.6	24
Chemicals	8.5	36
Pharmaceutical & Biotech	8.1	24
Utilities	7.8	18
Industrial Metals	7.5	14
Oil & Gas	7.3	15
Construction	5.8	21
Power & Electricity	5.7	21
Forest & Paper	4.8	9
Hospitality; Sports & Leisure	4.0	4
Healthcare	2.0	2

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Increased Cost of Working / Alternatives

$\langle \text{COW} \rangle / \langle \text{BI} \rangle = 33\%$

Industry	$\langle \text{COW} \rangle / \langle \text{BI} \rangle$ [%]
Transportation	99%
Technology	51%
General Industries	54%
Pharma & Biotech	44%
Mining	41%
Chemicals	40%
Forest & Paper	38%
Industrial Metals	36%
Food & Beverage	35%
Oil & Gas	34%
Consumer Products	33%
Power & Electricity	25%
Aerospace & Defense	18%
Real Estate	12%
Wholesale	6%
Automotive	6%
Retail	5%
Construction	1%
Average	33%

If Alternatives, then where?

54% no alternatives

Alternatives on site [%]	37%
Alternatives within group [%]	36%
Alternatives from market [%]	41%
Sum of alternatives [%]	114%

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How we assess BI




BI Assessment: Involvement of head of production, procurement, finance

1. Identification of **critical BI exposures**
 - a. Important impact on value creation
 - b. Long recovery time
 - c. Limited, unreliable alternative
2. Technical protection & also **business related controls / alternatives**
3. BI **mitigation** measures leading into BCM

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2 Basic Cases in Interdependency Analysis

Propagation of business interruption in value chain




- a. **Damping** of business interruption in group - **Horizontal Integration**
Redundant resources to produce same component (site 1 & site 2)
 ⇒ Check on production capacities

Site 1 - Component 1
2 shifts [⇒ 3rd shift]



Site 2 - Component 1
2 shifts [⇒ 3rd shift]



Site 3 - further assembly of product


Site 1 EML

Site 1 BI EML


BI TIV 2

Interd. TIV 3
- b. **Leveraging** of business interruption in group – **Vertical Integration**
 “Orchestrated production” – **every site contributes one component**

Site 1 - Component 1
body



Site 2 - Component 2
wheels



Site 3 - assembly of product

Site 1 EML

Site 1 BI EML


Interdependency

Interdependency

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Vertical vs. horizontal Integration



Vertical integration:

- "Make or Buy"-Decisions
- Supply chain of a company is owned by company

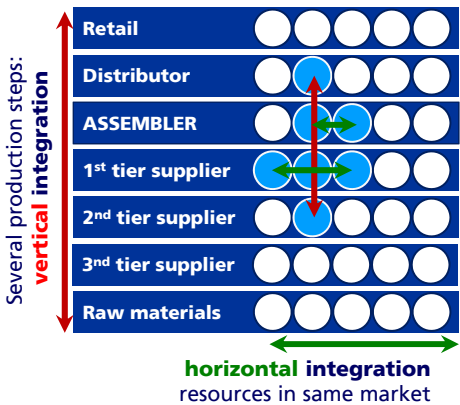
E.g.: Ford River Rouge Complex 1928, from iron ore to car

Horizontal integration:

Company acquires competitor of same stage of production in same industry to create market power

E.g.:

- Heinz & Kraft Foods merge March 25th, 2015;
- Lafarge Holcim merger of equals 2015



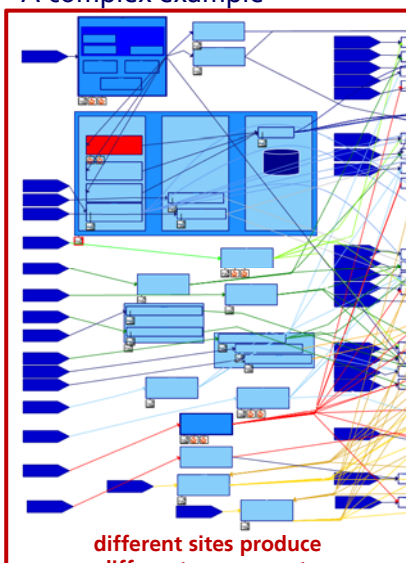
horizontal integration
resources in same market

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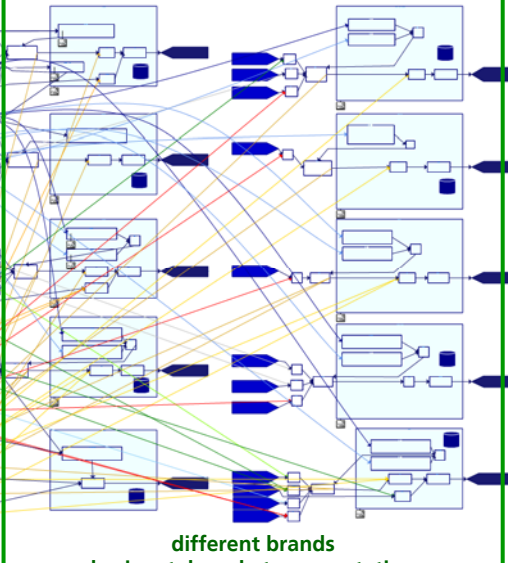
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Risk Management along the Value Chain

A complex example

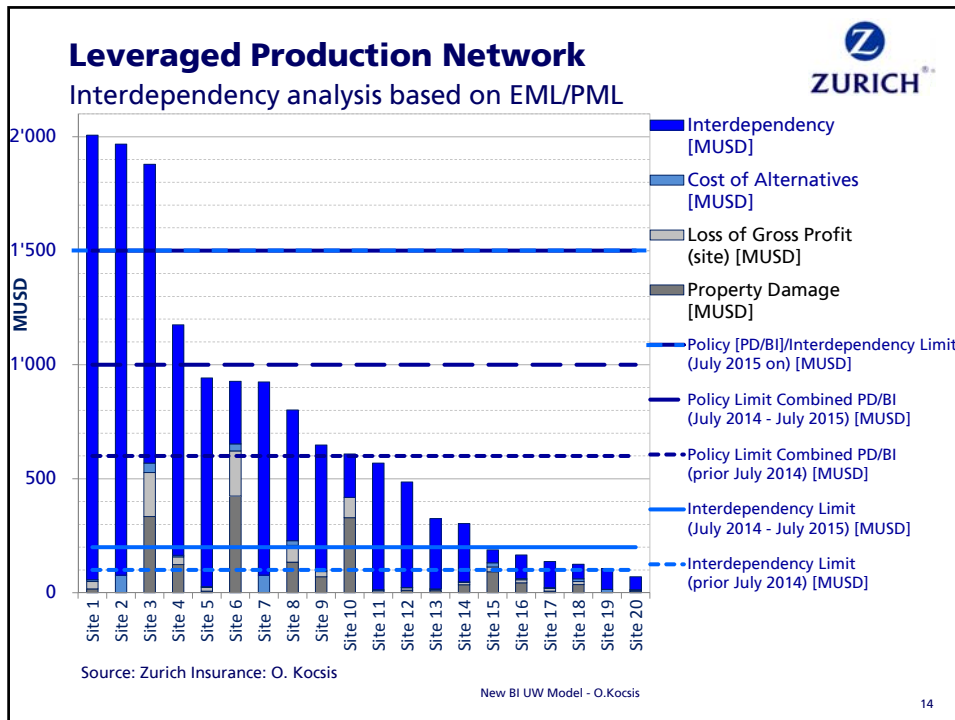


**different sites produce
different components**



**different brands
horizontal market segmentation**

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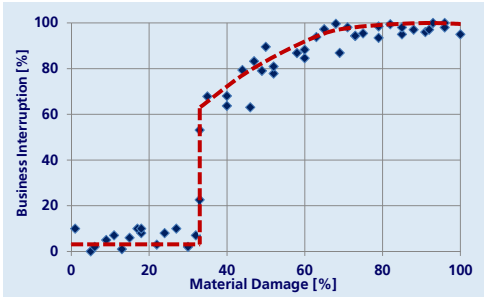
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Modelling of Business Interruption Top down



based on **Claims Data per major industry:**

- BI Recovery Times – related to PD damage
- Share of alternatives
- Increased cost of working




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Modelling Business Interruption Bottom-up: considering structure of industry value chain



1. Process within Company/Industry

- horizontal / vertical integration
- alternatives & production capacity
- Financial strength / insurance

3. Interdependencies CBI

- Impact of site on group / VC
- Assemblers

2c) Utilities:

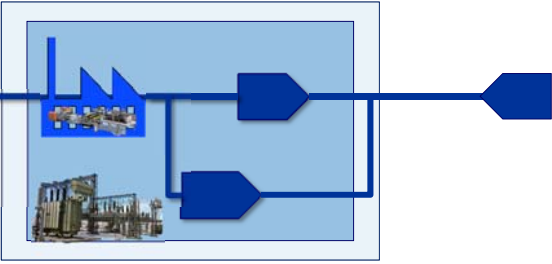
- Size / Lead time
- Alternatives: generator rental / ICOW

2b) Critical Equipment:

- Impact, criticality,
- Lead time
- Alternatives / ICOW

2a) Building:

- Construction class (steel, concrete,...)
- Floors (above, below), bldg. size
- Primary characteristics
- Customization



4. Area damage

- Delay of recovery
- Lifelines: power, communication, water
- Bridges, streets, railways, ports,

5. Economy

- Downturn in Cat epicenter
- Upturn in Cat surrounding

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Summary


1. **BI / CBI share increased** to 45% of total property claims
 - Driver: increased interdependencies due to globalization
 - Business Resilience Management not yet established / mature
2. **BI / CBI exposure depends heavily on industry**
3. Depending on **location of NatCat** event **different industries affected** ⇒ varying interdependencies / BI / CBI exposure
4. **Modelling of BI / CBI:**
 - Not only fitting of parameters
 - To be **performed per industry** considering value chain characteristics
 - Needs to be improved
5. The "Internet of Things" and increasing automation are influencing and impacting supply chains / BI / CBI further




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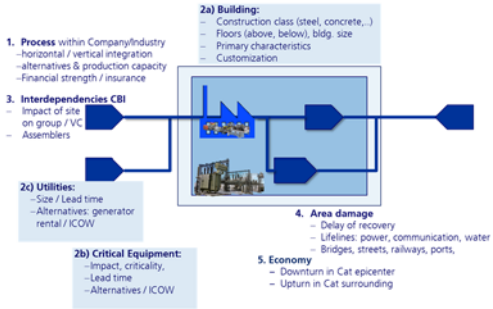
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Risk Management along the Value Chain: Overcome Vulnerability for Competitive Advantage!





Discussion
Q&A



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