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Business Interruption – What Can We Learn From History?

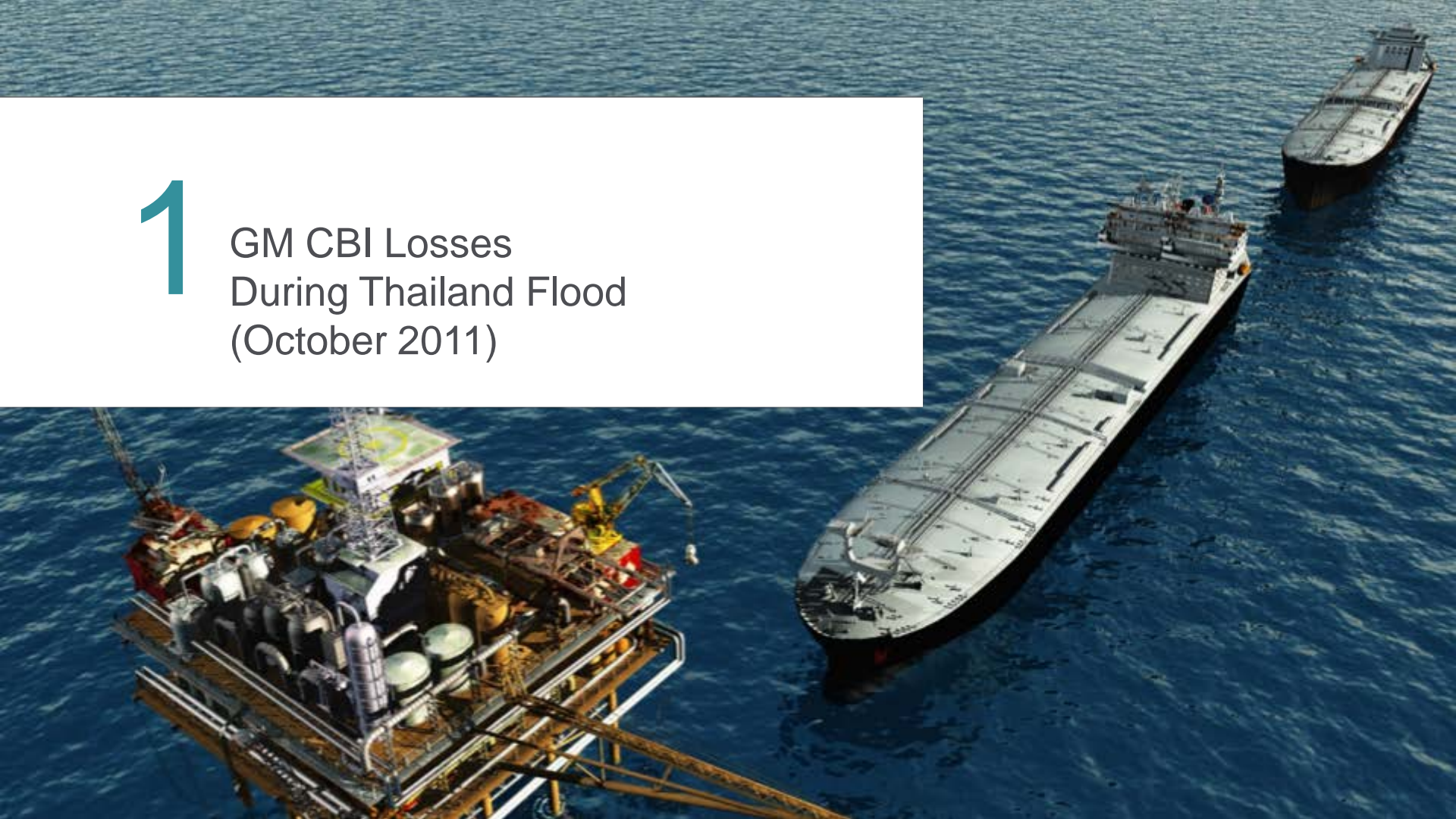
June 6th, 2016
Victor Min, FCAS, MAAA
Munich Reinsurance America, Inc



- GM CBI Loss During Thailand Flood (October 2011)
- Western Digital BI Loss During Thailand Flood & Ensuing DirecTV CBI loss (October 2011)
- SK Hynix BI Loss in Wuxi, China & Ensuing CBI losses for Microsoft and HP (September 2013)

1

GM CBI Losses
During Thailand Flood
(October 2011)



Thailand Flood (October 2011) – Worst In 50 Years

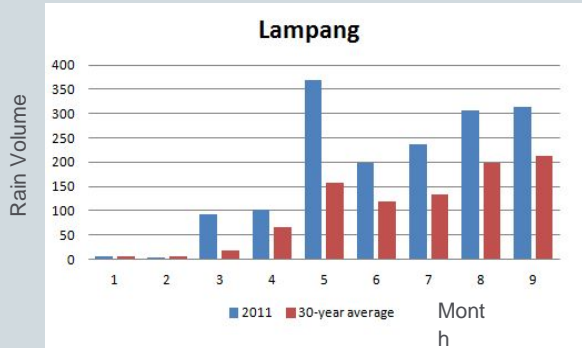


Image: <http://destination-yisrael.biblesearchers.com/destination-yisrael/2011>

Source: New Mandala (<http://asiapacific.anu.edu.au>)

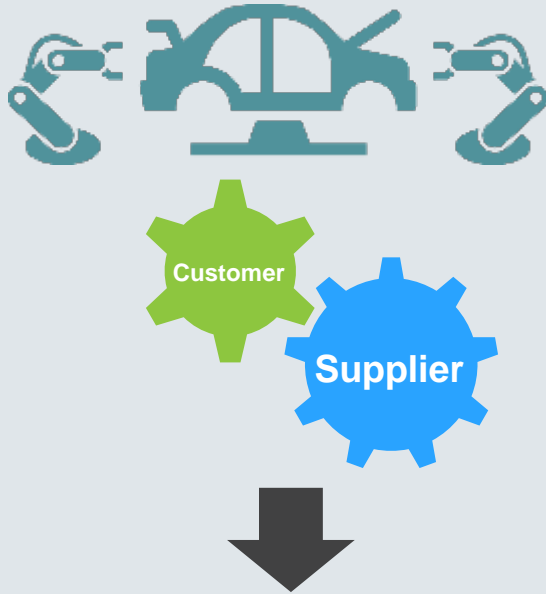
Thailand Flood Situation (October 2011)



Image: <http://www.bloomberg.com/news/articles/2011-11-14/>

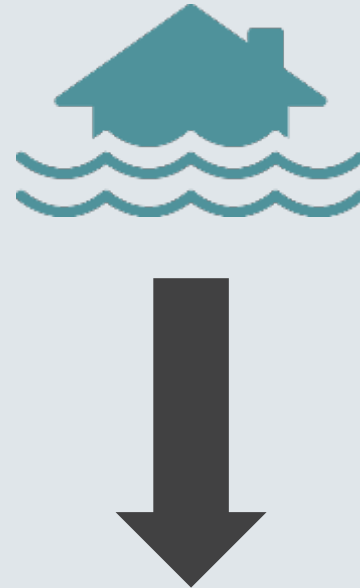
GM's Loss Situation During Thailand Flood (October 2011)

Location 1 – Assembly Plant



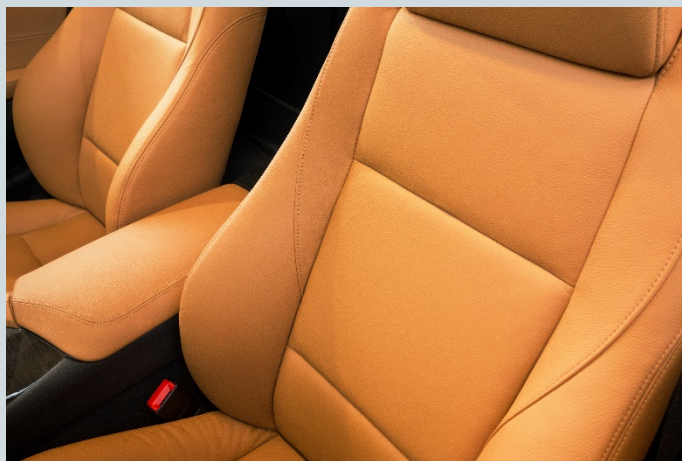
Total CBI loss amounted to be over \$100m

Location 2 – Training Facility



Direct physical damage = \$1m

GM's Missing Parts

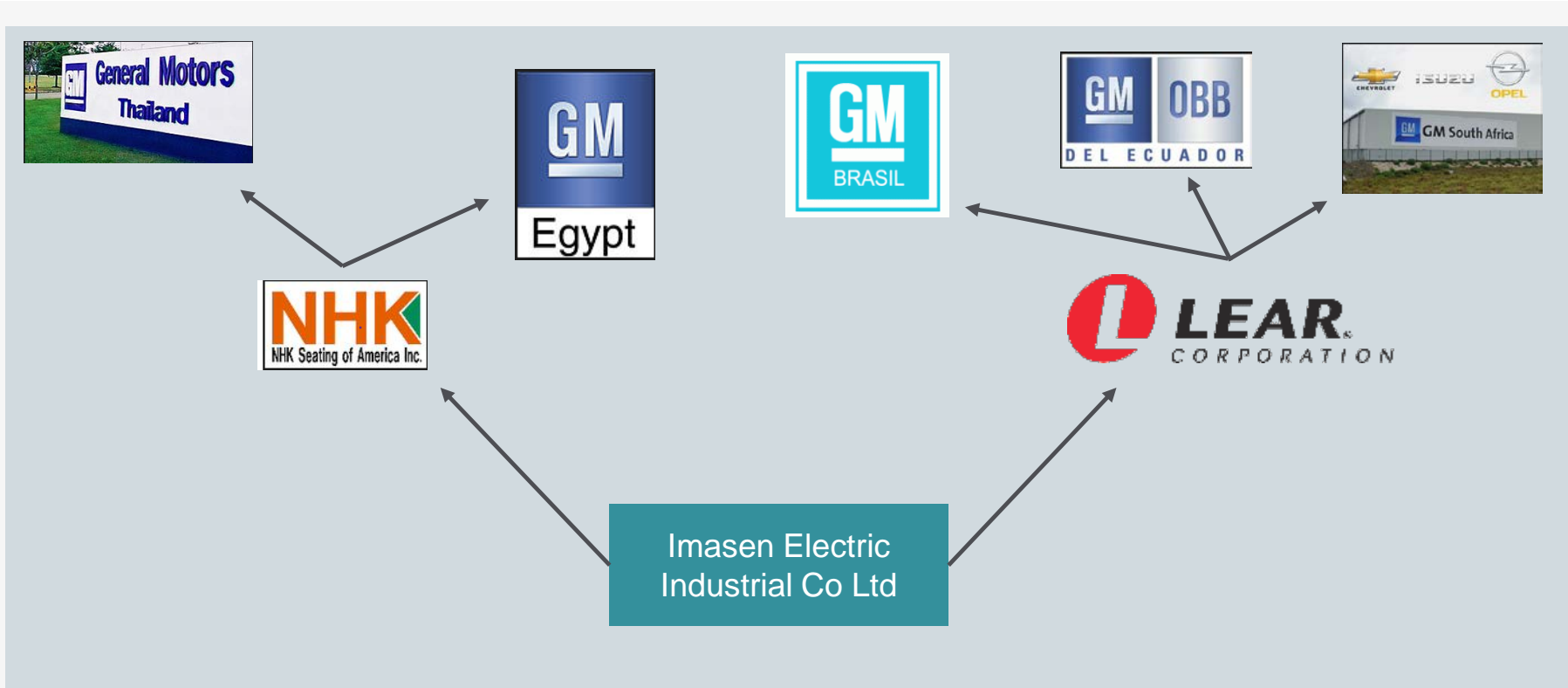


← Seat framework
track rails

→ Seat back
frameworks



GM's Supply Chain Flow Chart





2

Western Digital BI Loss During
Thailand Flood & Ensuing DirecTV
CBI Loss (October 2011)



World's leading manufacturer of hard disc drives



60%

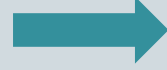
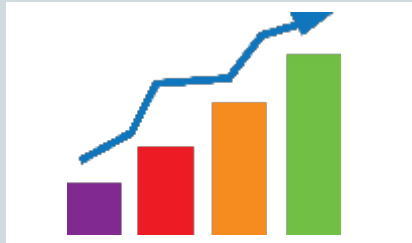


100%

DirecTV's CBI Loss Caused by Western Digital During Thailand Flood



Policy wording requires “Actual Loss Sustained” whereas BI loss projection was based on pessimistic assumptions



The insured's gross margin on sales actually increased following the flood



Western Digital's BI Loss Calculations

Western Digital's Initial BI Loss Projection

Description	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Total
Standard Sales - Based on Budget	3,000,000,000	2,800,000,000	2,600,000,000	2,400,000,000	10,800,000,000
Less: Period of Liability Sales	1,950,000,000	1,820,000,000	1,690,000,000	1,560,000,000	7,020,000,000
Lost Sales	1,050,000,000	980,000,000	910,000,000	840,000,000	3,780,000,000
Profit Margin	20.0%	20.0%	20.0%	20.0%	20.0%
Business Income Loss	210,000,000	196,000,000	182,000,000	168,000,000	756,000,000

Western Digital's Actual BI Loss Calculation

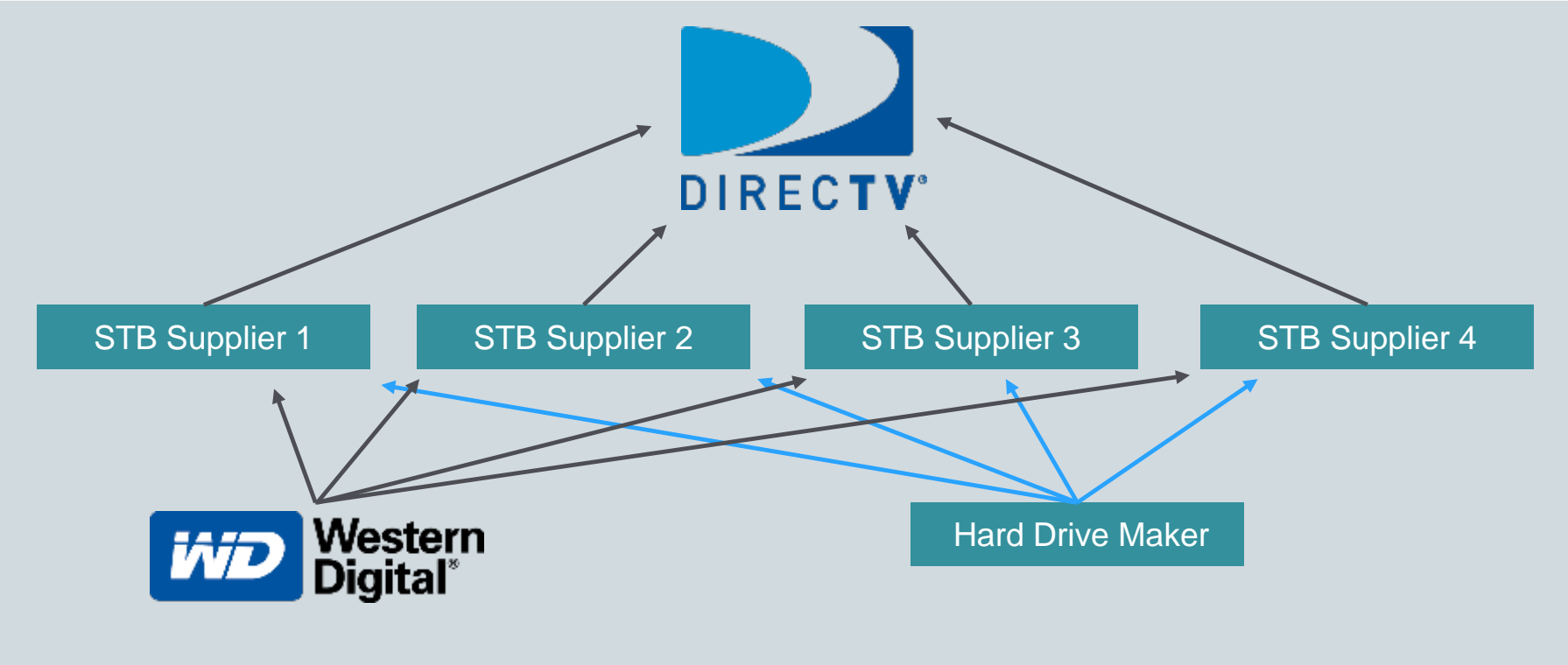
Description	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Total
Standard Sales - Based on Budget	3,000,000,000	2,800,000,000	2,600,000,000	2,400,000,000	10,800,000,000
Profit Margin	20.0%	20.0%	20.0%	20.0%	20.0%
Projected Business Income	600,000,000	560,000,000	520,000,000	480,000,000	2,160,000,000
Actual Standard Sales	1,950,000,000	1,820,000,000	1,690,000,000	1,560,000,000	7,020,000,000
Profit Margin	40.0%	40.0%	40.0%	40.0%	40.0%
Projected Business Income	780,000,000	728,000,000	676,000,000	624,000,000	2,808,000,000

Note: Figures are created for illustration purposes

DirecTV's CBI Loss Caused by Western Digital During Thailand Flood



DirecTV's Setup Box Supply Chain Flow Chart



DirecTV's CBI Loss Caused by Western Digital During Thailand Flood



Insurance policy only covers “direct supplier, contract manufacturer or contract service provider” to DirecTV



The court agreed with the insurer, writing: “...The ordinary meaning of ‘direct supplier’ does not apply to a situation where DirecTV never received anything from Western Digital.”



Risk managers and insurance brokers should understand the insured's business operation and supply chain fully. The policy wording could have been amended to include indirect suppliers, or at least certain indirect suppliers.

3

SK Hynix BI Loss in Wuxi, China
& Ensuing CBI losses for Microsoft
and HP (September 2013)



SK Hynix BI Loss in Wuxi, China (September 2013) Background



Worldwide leading memory chips maker



SK Hynix Facility Explosion & Fire in Wuxi, China (September 2013)



Image source - <http://businesskorea.co.kr/english/news/industry/>

Image source - <http://www.ecns.cn/visual/hd/2013/09-05/24795.shtml>

SK Hynix's Products & Fab Facility

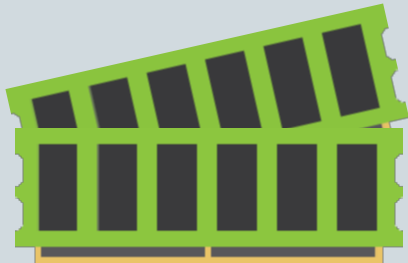


Image source - <http://www.earthtimes.org/climate/socking-soot-clean-air-save-ice-caps/1320/>

SK Hynix Facility Explosion & Fire in Wuxi, China (September 2013)



Clean rooms are on the third level of the building



Explosion occurred on the second level of the building

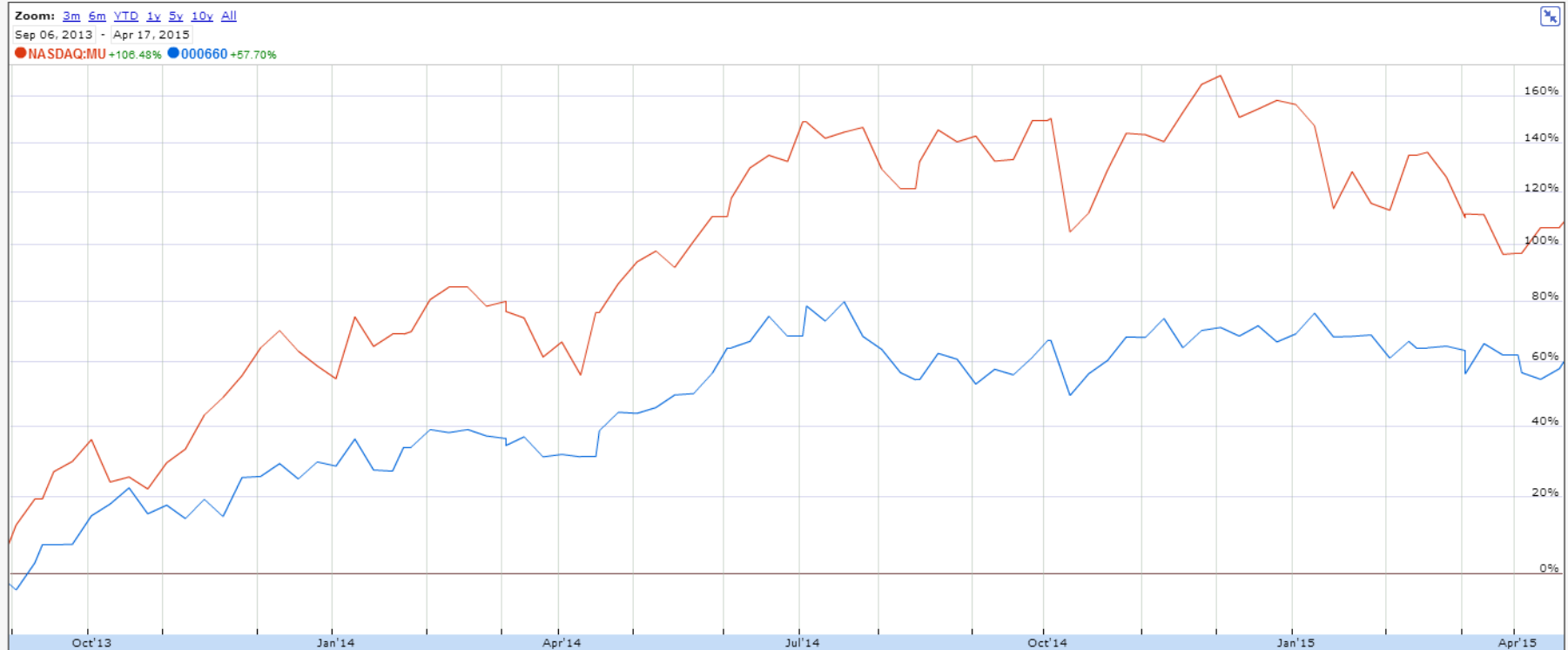


Total PD loss > \$600m



Total BI loss > \$200m

SK Hynix's Stock Performance vs. Micron Technology



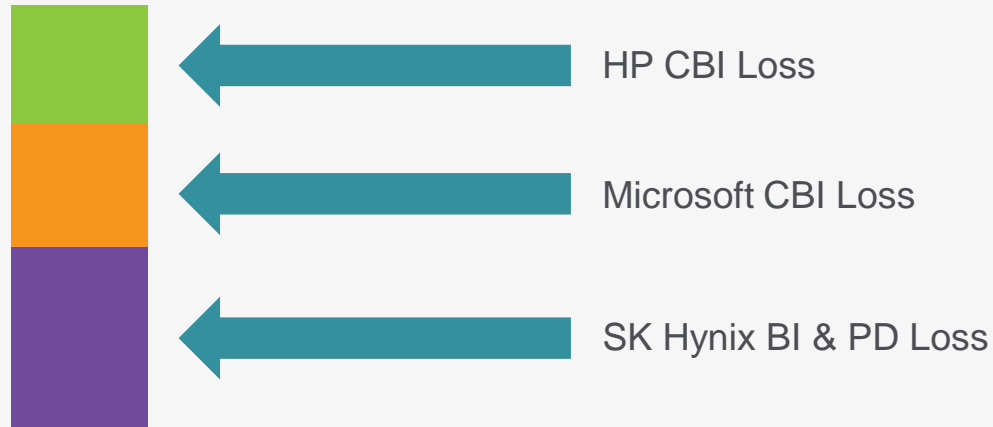
Source: Google Finance

SK Hynix Caused CBI Loss (September 2013)



SK Hynix BI and related CBI Losses – A Reinsurer’s Perspective

- A SK Hynix type of situation poses challenges for both primary insurers and their reinsurers in estimating and managing risk accumulations.
- Depending on the risk definition in the reinsurance contracts, CBI losses incurred by Microsoft and HP can be added to SK Hynix’s loss. Consequently, reinsurance exposure and recovery became much higher.



SK Hynix Caused CBI Loss – Lessons Learned

- "Clean rooms" and their equipment can become total losses from smoke and thermal damage even if they were not directly damaged by flame. Business interruption losses depend not only on the equipment lost, but how quickly a clean room can be re-certified.
- Semiconductor manufacturing is a dynamic occupancy where renewals submitted with "per expiring" values should be questioned. This loss affected much of the world's memory chip production that other manufacturers will benefit from the current shortfall. That will increase the BI exposure at those facilities.
- Many semi-conductor fabrication plants do contract work for others and are operating at full capacity. If an insurer is providing CBI coverage, keeping it on a "named supplier" basis will limit the chance of being surprised by a loss that wasn't anticipate.
- When evaluating CBI exposures, underwriters sometimes over emphasize the availability of "make-up capability." Many business continuity plans aren't truly tested until disaster strikes.



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