



Analysis of Offshore Risk and Post-Hurricane Reaction

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Introduction



- A concept that tends to denote the probability of some undesirable event.
- Risk usually has implications, primarily a loss of value if the undesirable event occurs.
- Typically associated with the expected value of a negative event occurring. The expected value is calculated as the probability of the event times its consequences.

Transportation Risks

- Boat accidents
- Helicopter accidents

Operator-Related Risks

- Operator error
- Operator negligence

Weather-Related Risks

- Hurricane
- Wind
- Wave

Equipment-Related Risks

- Crane accidents
- Equipment defects and malfunctions

Environmental-Related Risks

- Blowouts
- Fires and Explosions
- Spills
- Unintentional Discharges
- Pipeline strikes/failures
- Platform strikes/failures



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Importance of Understanding Offshore Risk

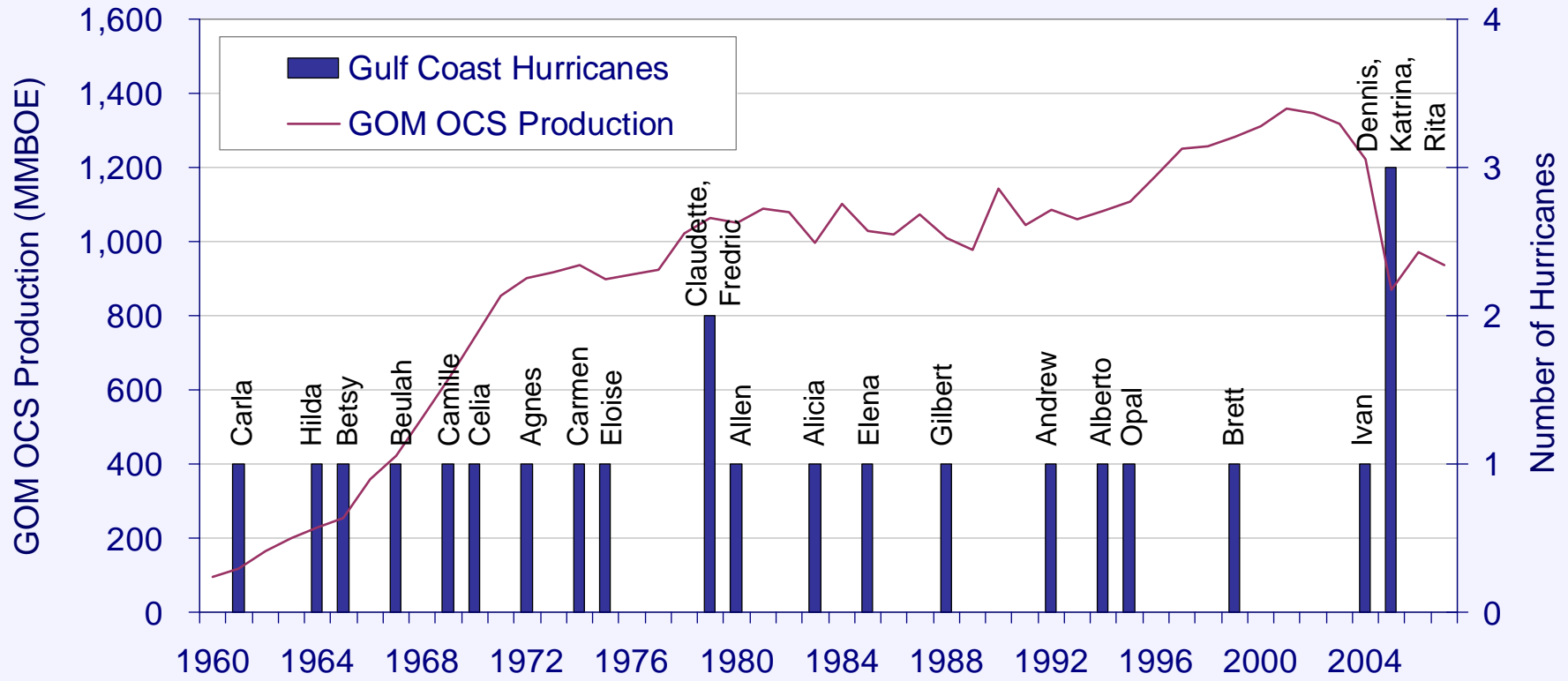


- Belief that the frequency of hurricane events could be increasing for a variety of opinions.
- Clearly the case in the current period that the value of the event's impact has increased considerable since:
 - There are a larger number of higher valued assets that are potentially impacted.
 - The loss of production from the event has higher than historical normal value.



- If correct, these changes can impact the cost and profitability of offshore activities.
- Potentially impacts the attractiveness of making future and continued investments in the GOM.

GOM OCS Production and Hurricanes



Source: Louisiana Department of Natural Resources. 2009. Louisiana Energy Facts and Figures. Internet website: http://dnr.louisiana.gov/sec/execdiv/techasmt/facts_figures/index.htm; U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Atlantic Oceanographic and Meteorological Laboratory. 2009. Memorable Gulf Coast hurricanes of the 20th century. Internet website: <http://www.aoml.noaa.gov/general/lib/mgch.html>; and U.S. Department of Commerce, National Oceanic and Atmospheric Administration. 2009. Hurricane history. Internet website: <http://www.nhc.noaa.gov/HAW2/english/history.shtml>.



- Two common forms of risk reduction actions: (a) insurance and (b) diversification.
- This research examines pre- and post-storm (Hurricane Katrina and Rita) activity to examine which form of risk reduction activity tended to be more prevalent.



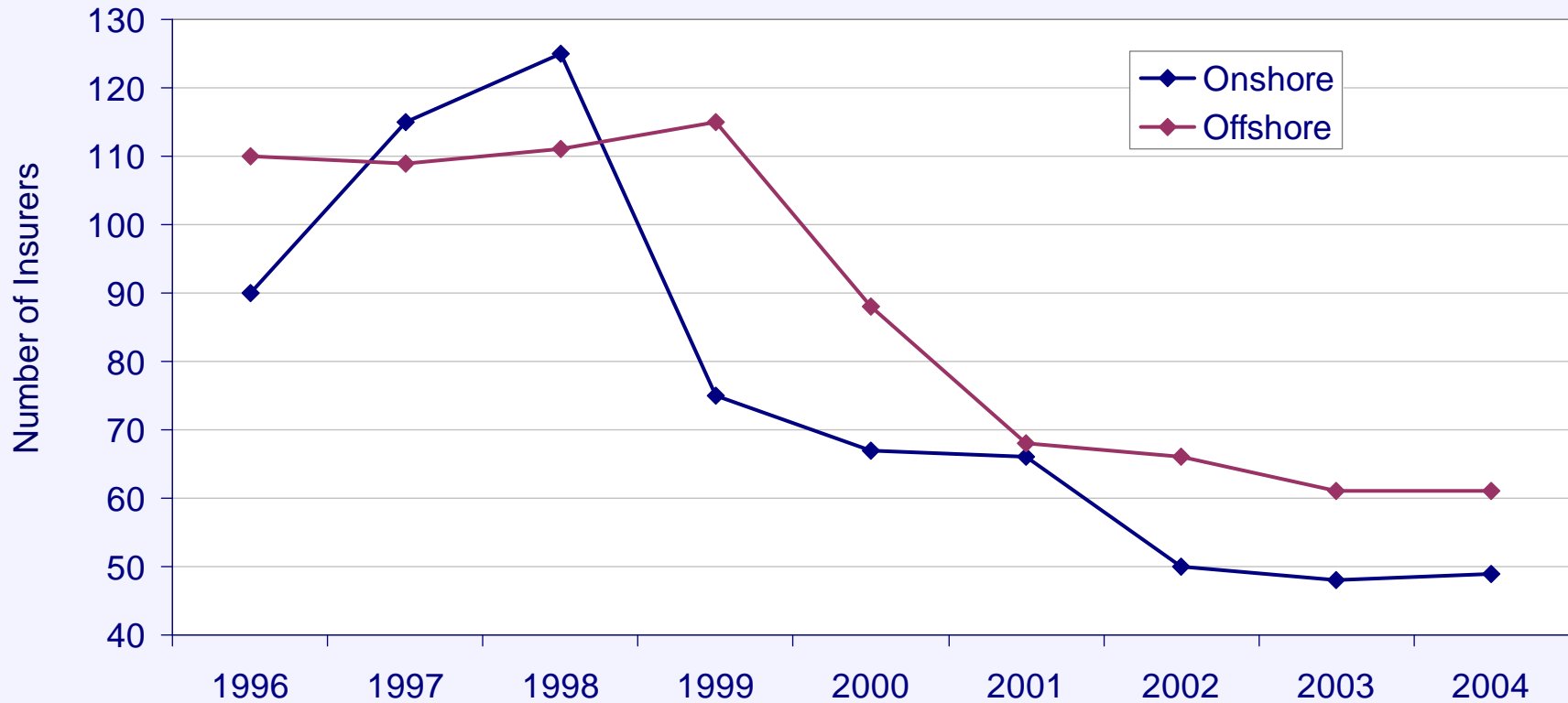
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Offshore Insurance

- Similar to other forms of commercial insurance that are based upon a premium-deductibles structure.
- Historically (late 1960s, early 1970s) deductibles were allowed to go to relatively low levels.
- Few underwriters but many brokers – underwriters rarely met with the actual companies.
- Oil spills and other environmental events of the late 1960s and early 1970s (forward) put increasing pressure on the industry.
- Stakes increased as production moved to more capital intensive and costly investments.
- Insurance options included:
 - a) traditional insurance
 - b) self insurance
 - c) club or pooling insurance
 - d) catastrophe bonds



- Typically have a premium and deductible structure. In recent times total cap on overall coverage.
- Annual premiums usually run around 0.75 percent of total platform/structure replacement value.
- Typical \$1 billion facility would pay \$7.5 MM per year at such levels.
- Some reported statistics have companies spending as much as 0.4 percent of gross revenue on physical insurance products.



Note: Values are estimated from source.

Source: Gosselin, Mike. 2006. Energy insurance in the balance. LIU Global Marine & Energy. Presentation given February 9, 2006.



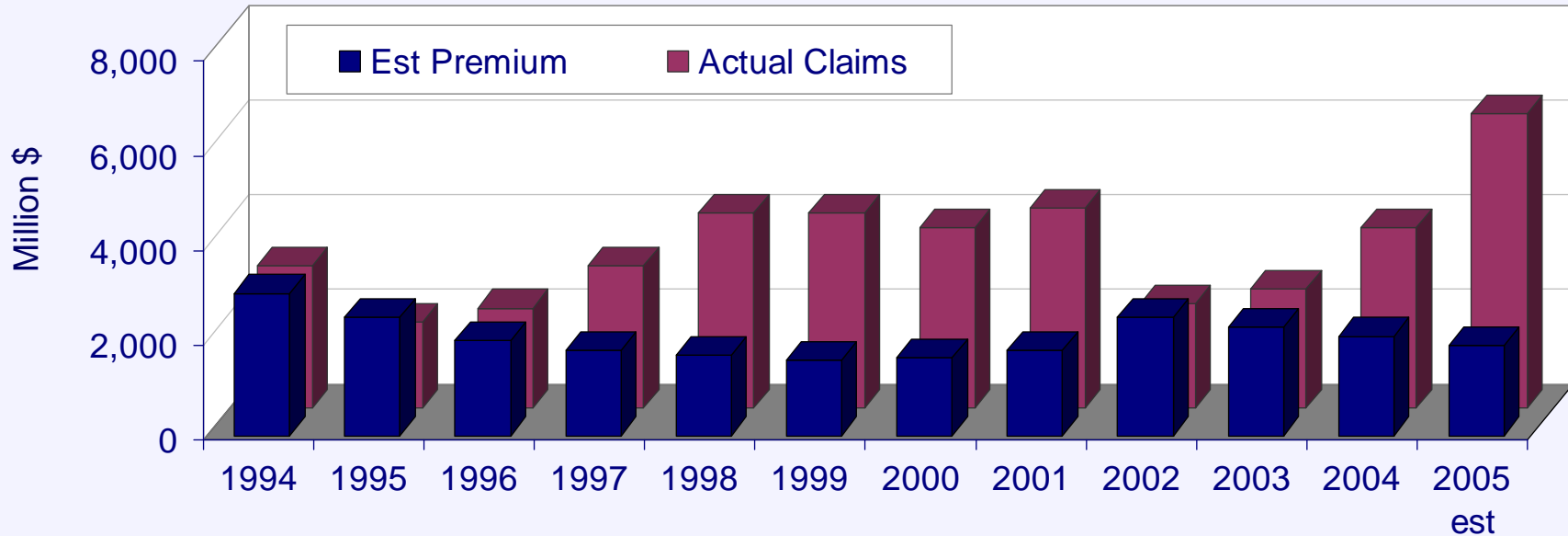
- Premiums had been falling since 2001 and prior to storms (2004) had seen significant reduction.
- Premiums 2004-2005 (pre-storm) are reported to have fallen by as much as 20 percent.
- Competition, lack of major claims, long stream without major claims are some of the reasons for the reductions in premiums.



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Estimated Energy Losses 1994 – 2005 Global Energy Premium vs. Claims Onshore and Offshore

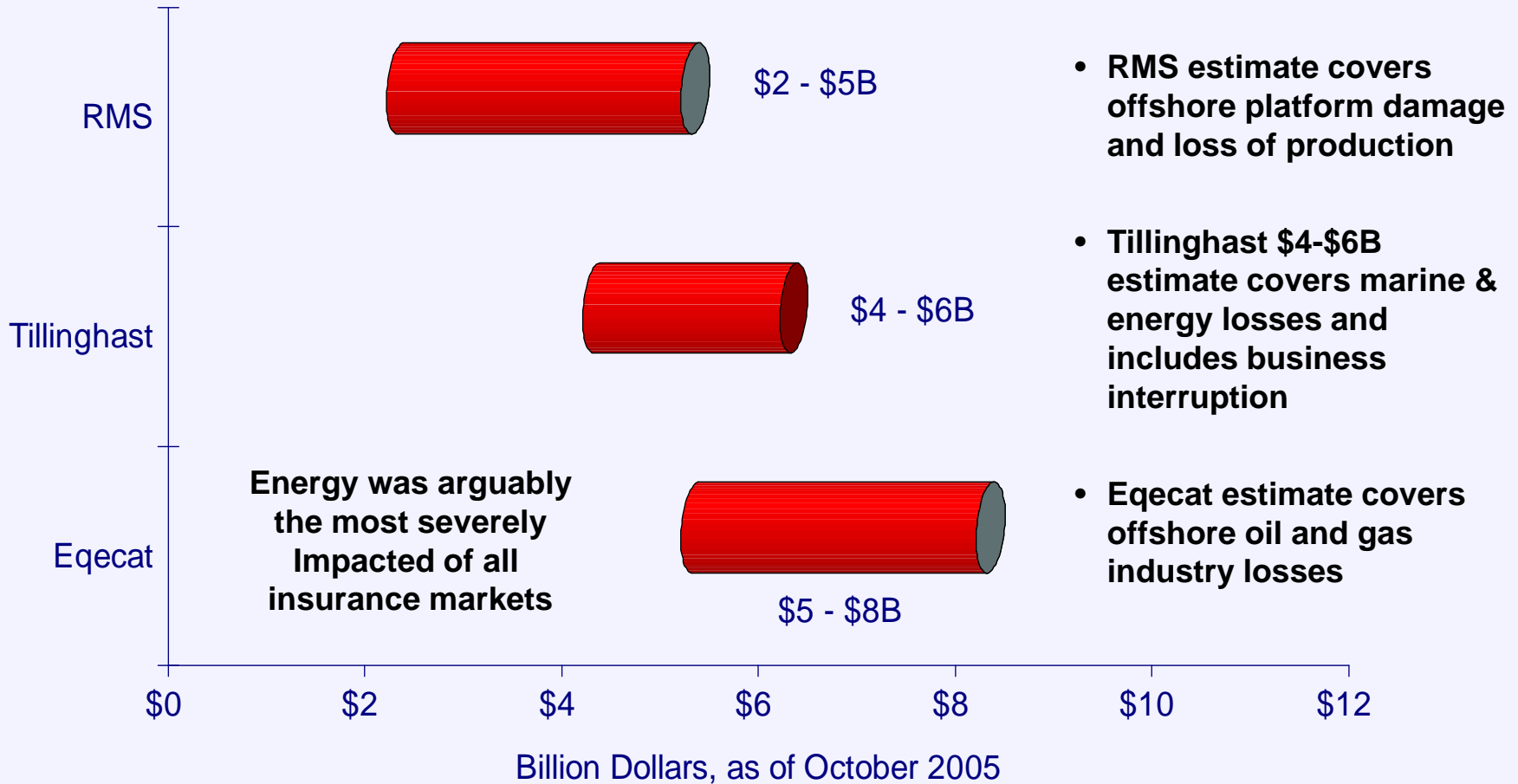
	1994-2004	1994-2005 est
GWP	\$ 27,850	\$ 30,080
Claims	\$ 35,000	\$ 42,450
L/R	1.26	1.41



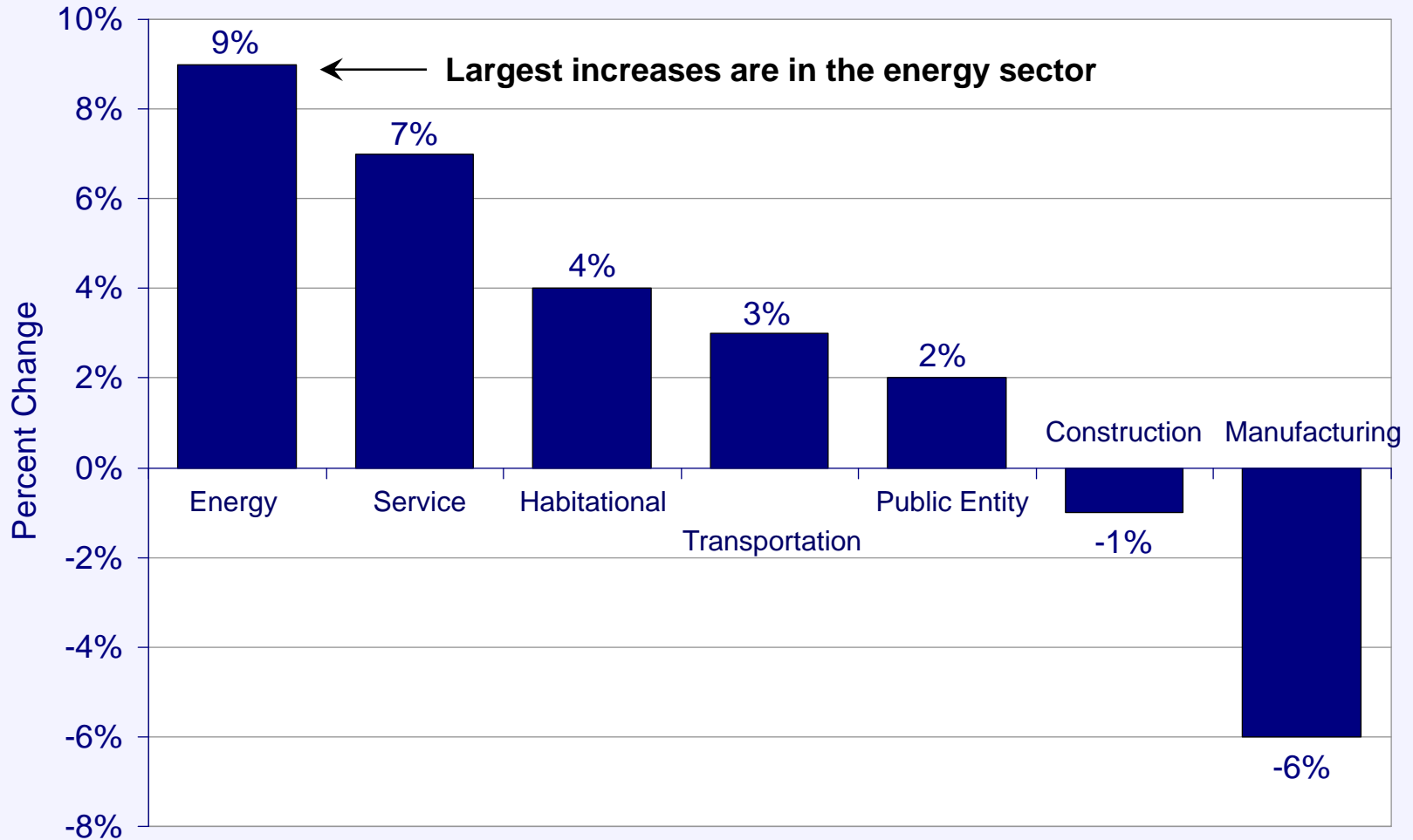
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Insurance damage losses will have to be made up – reduced coverage, higher premiums, and coverage caps



Average Rate Increase/Decrease by Industry Class (2005-2006)





- Increasing premiums with some individual reports of over 100 percent increase in insurance costs (not clear if this was limited to physical costs alone, or included business interruption).
- Less coverage:
 - Higher deductibles
 - Total claims caps – basic caps at \$1 MM with amounts in excess covered under supplemental programs.
 - OIL Insurance – reduced pre event claims from max of \$1 billion to \$500 MM.



- Larger companies can individually insure all or parts of their operations.
- Typically done through the creation of a financial storm reserve (deferred account) into which capital is transferred for recovery.
- These can be drawn upon in times of catastrophic events.
- Challenges:
 - Determining the appropriate reserve balance.
 - Reserve build-up schedule.
 - Opportunity cost of capital.



- Groups of similarly-situated companies pool their resources together for coverage.
- Challenges in defining “similarly-situated” companies since it defines their risk and exposure profiles.
- Relatively homogeneous groups much easier to work within this framework than others.
- Some examples in the oil and gas industry as well as supporting industries like shipping/maritime industry.
- Oil Insurance Ltd. (“OIL”) is an example although its formation principles have changed over time.



- Formed in 1971 in reaction to large catastrophic challenges for onshore (refinery) and offshore (oil spill) incidents.
- Originally formed as what is referred to as a “spread-loss” company.
- Located in Bermuda and has 2008 net income of over \$37 billion (2006 had net income loss of \$118 million).
- Originally formed by 15 oil and gas companies (many integrated). Participation was as large as 50 in 1992, today approximately 43 companies.
- Coverage limited to physical damage, well control, and pollution control.
- Collectively, these companies have balance sheets that dwarf most commercial insurance companies.

- Original governing documents noted:

“...the parties have found that there is no longer available to petroleum companies, on terms consistent with sound business practice, commercial insurance covering substantial risks including catastrophe coverage for on-shore and off-shore property, pollution, and bring under control wild oil or gas wells...”

.... Parties have determined that this requires the formation of a new insurance company whose shareholders will be those petroleum-related companies that become policy holders of the new company.”



- Original set up like a risk-financing facility.
- Collected premiums in advance, and maintained segregated reserves which were specifically identifiable to the individual participants.
- Intent was that if you made claim in excess of your reserve you would pay a “retroactive premium” amortized over 5 years, to replenish YOUR account in the fund.
- Note: this does not shift or reduce risk (just reimbursement risk). As a result, Supreme Court (*Lincoln Loan Assc.*) ruled these types of mechanisms are not a true insurance expense, and deductible for tax purposes.
- OIL then reformed upon more traditional lines that pooled the reserve. Shift from “spread-loss” to “mutual” insurance company.
- Assumed all faced same risk and that size was only differentiating factor for premium purposes.



- Financial securities developed to shift risk from offshore producers/operators to the market.
- Market determines the value of risk, which varies as securities are traded across parties and time.
- Very efficient means of shifting risk (provided there is a market).
- Bonds are purchased at price plus return for fixed period.
- Proceeds are used to cover the losses from a qualifying catastrophic event.
- If event does not occur by maturity date, investor gets returns.
- Market has grown rapidly since 2005 where it was \$994 MM – recently, \$4.631 billion (2007).



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Changes in Diversification

- Another means of reducing risk is to simply reduce exposure by sharing the risk (and rewards) with other willing parties.
- Securing different owners/operators as partners in a particular project would be an example of diversifying risk through ownership.
- Parties could enter into swapping agreements where risk averse party trades its higher return, but higher risk asset with more risk seeking party that has lower (relative) risk, lower return asset.
- Our second analysis has been in examining ownership changes to determine whether these types of activities were occurring in the aggregate after the 2005 tropical season.
- Examined a number of different ownership structures pre and post storm to see if there were any significant empirical changes in the number of owners or the “velocity” of ownership changes.



Operator	Pre Storm Volume (MMBbls)	Post Storm Volume (MMBbls)	Difference (%)
1 Shell Offshore Inc.	288.1	300.4	4.3%
2 BP Exploration & Production Inc.	157.4	256.2	62.8%
3 Chevron U.S.A. Inc.	129.8	120.3	-7.4%
4 Kerr-McGee Oil & Gas Corporation	69.9	90.2	29.0%
5 Exxon Mobil Corporation	46.5	37.8	-18.7%
6 Apache Corporation	33.0	49.8	50.8%
7 Hess Corporation	27.5	26.2	-4.8%
8 Nexen Petroleum U.S.A. Inc.	17.9	n.a.	n.a.
9 Marathon Oil Company	17.1	14.5	-15.1%
10 Pogo Producing Company	16.1	n.a.	n.a.
11 Eni Petroleum Co. Inc.	14.4	28.9	101.1%
12 Devon Energy Production Company, L.P.	13.5	12.0	-10.7%
13 BP America Production Company	13.1	n.a.	n.a.
14 Murphy Exploration & Production Company - USA	12.4	30.9	148.9%
15 Newfield Exploration Company	12.0	n.a.	n.a.
16 Shell Gulf of Mexico Inc.	11.7	14.4	23.7%
17 Dominion Exploration & Production, Inc.	10.9	27.6	153.0%
18 Union Oil Company of California	10.8	n.a.	n.a.
19 Anadarko Petroleum Corporation	10.5	25.6	144.1%
20 Murphy Exploration & Production Company	10.0	n.a.	n.a.
21 Devon Louisiana Corporation	9.4	n.a.	n.a.
22 Walter Oil & Gas Corporation	8.1	10.4	27.8%
23 Stone Energy Corporation	8.1	12.8	58.7%
24 BHP Billiton Petroleum (GOM) Inc.	7.7	n.a.	n.a.
25 TOTAL E&P USA, INC.	6.6	n.a.	n.a.

Note: Pre-storm is Aug 2003 through July 2005; Post-storm is Oct 2005 through Dec 2008



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Top 25 Operators by Pre-Storm Volume Natural Gas

Operator	Pre Storm Volume (Bcf)	Post Storm Volume (Bcf)	Difference (%)
1 Shell Offshore Inc.	1,004.7	981.5	-2.3%
2 Chevron U.S.A. Inc.	677.6	590.0	-12.9%
3 BP Exploration & Production Inc.	584.5	411.8	-29.5%
4 Kerr-McGee Oil & Gas Corporation	476.6	469.6	-1.5%
5 Exxon Mobil Corporation	439.8	348.0	-20.9%
6 Apache Corporation	363.9	550.6	51.3%
7 Newfield Exploration Company	252.7	198.3	-21.5%
8 Union Oil Company of California	248.2	152.9	-38.4%
9 Pioneer Natural Resources USA, Inc.	169.1	n.a.	n.a.
10 Walter Oil & Gas Corporation	151.0	128.2	-15.1%
11 Devon Energy Production Company, L.P.	146.2	115.1	-21.3%
12 Dominion Exploration & Production, Inc.	135.9	148.5	9.3%
13 Hess Corporation	128.2	105.8	-17.5%
14 TOTAL E&P USA, INC.	127.1	n.a.	n.a.
15 Forest Oil Corporation	125.3	n.a.	n.a.
16 Stone Energy Corporation	119.7	101.5	-15.2%
17 El Paso Production GOM Inc.	118.5	n.a.	n.a.
18 The Houston Exploration Company	107.7	n.a.	n.a.
19 BP America Production Company	106.7	n.a.	n.a.
20 Hydro Gulf of Mexico, L.L.C.	99.7	83.7	-16.0%
21 Eni Petroleum Co. Inc.	98.3	158.8	61.5%
22 W & T Offshore, Inc.	97.8	135.5	38.6%
23 Marathon Oil Company	96.0	n.a.	n.a.
24 Remington Oil and Gas Corporation	95.0	n.a.	n.a.
25 GOM Shelf LLC	94.5	111.5	18.0%

Note: Pre-storm is Aug 2003 through July 2005; Post-storm is Oct 2005 through Dec 2008



Production on Leases with Structures Damaged or Destroyed by Katrina/Rita

Impact on Structure	Pre-Storm Production (MMBbls)	Post-Storm Production (MMBbls)	Percent Change
Damaged	125.5	133.8	6.6%
Destroyed	31.9	1.6	-94.9%
Total	157.4	135.4	-14.0%

Impact on Structure	Pre-Storm Production (Bcf)	Post-Storm Production (Bcf)	Percent Change
Damaged	680.9	508.1	-25.4%
Destroyed	161.2	47.8	-70.4%
Total	842.1	555.9	-34.0%



Impact on Structure	Pre-Storm Number of Owners*	Post-Storm Number of Owners**	Percent Change
Damaged	1.87	1.85	-0.7%
Destroyed	1.63	1.65	1.1%
All Leases	1.51	1.38	-8.6%

Note: *Average number of owners per month during the pre-storm period (August 2003 through July 2005).

**Average number of owners per month during the post-storm period (October 2005 through December 2008).



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Questions, Comments, & Discussion

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