



# **Loss Trends: A Reinsurance Pricing Actuary's Perspective**



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## Agenda

- Reinsurer Trend Studies
  - Sources of Data
  - Validation of Trends
  - Issues in Applying Primary Trends to Excess of Loss Experience Rating
- Impact of the Current Economic Crisis – Food for Thought
  - Property
  - Auto
  - Workers Compensation
  - General Liability
  - Surety
  - Professional Liability
- Concluding Comments

## Sources of Trend

- ISO Trend Studies
- ENR Construction Cost Index
- NCCI State of the Line Presentation
- WCIRB Experience Reports
- Stanford Security Class Action Database – Security Class Action Frequency
- EEOC data for Employment Practices Liability
- Financial Supplements – Useful free information from numerous companies
  - Allstate Financial Supplements: Useful for Personal Auto and HO loss trends and rate changes
- Ceding Company Data
- Annual Statement Data
  - Select the desired line of business and types of companies, e.g. “regional companies”
  - Frequency – Claim Count Triangles provided compare to Onlevel EP
    - Caution: Sometimes the definitions of a claim change
  - Calculate average severity – Onesource provides up to 6 evaluations of gross data
  - Test reasonability of selected total trends from other sources.

# Sample Free Publicly Available Data - Allstate

THE ALLSTATE CORPORATION  
PROPERTY-LIABILITY  
ALLSTATE BRAND DOMESTIC OPERATING MEASURES AND STATISTICS <sup>(1)</sup>

Three months ended

	March 31, 2009	Dec. 31, 2008	Sept. 30, 2008	June 30, 2008	March 31, 2008
<b>Average Premium - Gross Written (\$)</b> <sup>(4)</sup>					
Standard auto	430	430	427	427	428
Non-standard auto	615	620	625	624	627
Auto	438	438	435	438	437
Homeowners	861	848	852	867	867
<b>Gross Bodily Injury Claim Frequency</b> <b>(% change year-over-year)</b>					
Standard auto <sup>(7)</sup>	5.5	(6.2)	(13.7)	(7.6)	(6.4)
Non-standard auto	15.9	(0.1)	(12.0)	(6.6)	(3.9)
Auto	5.9	(6.1)	(13.8)	(7.8)	(6.6)
<b>Gross Property Damage Claim Frequency</b> <b>(% change year-over-year)</b>					
Standard auto	1.6	(7.2)	(11.8)	(4.2)	(2.4)
Non-standard auto	7.1	(1.1)	(10.1)	(3.4)	(3.6)
Auto	1.7	(7.0)	(11.9)	(4.4)	(2.8)
<b>Auto Paid Severity</b> <b>(% change year-over-year)</b>					
Bodily injury	2.1	4.5	6.4	7.1	8.6
Property damage	(2.4)	0.7	(0.3)	2.6	4.1
<b>Homeowners Excluding Catastrophe Losses</b> <b>(% change year-over-year)</b>					
Gross claim frequency	4.6	8.1	5.4	13.7	1.5
Claim severity	3.2	9.6	(4.2)	0.3	3.3

## Do the trends fit?



- Are rating agency or other outside trends in line with client or industry gross experience?
- Are gross trends for this line of business appropriate for excess of loss business?

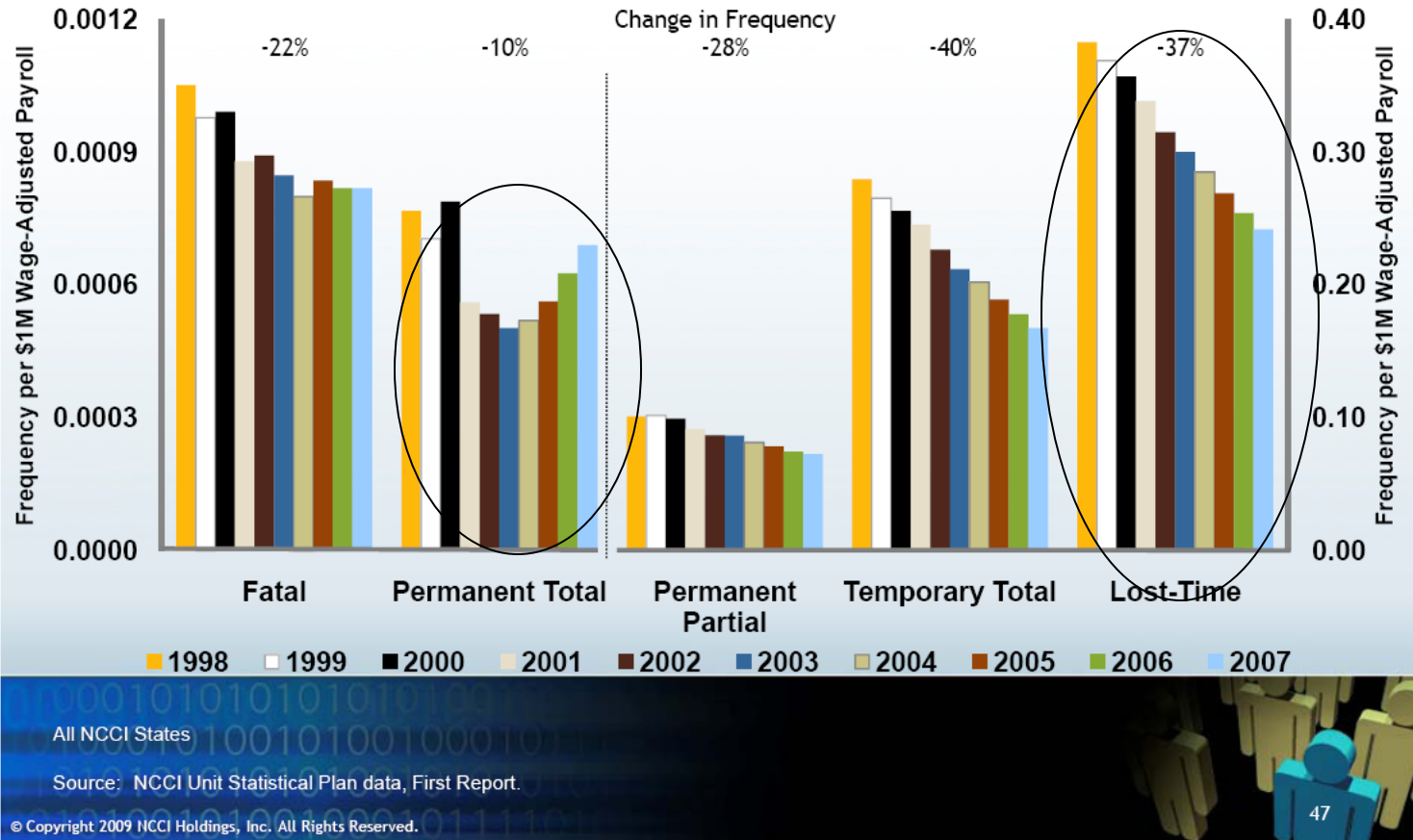
## Testing Initial Selected Trends: Commercial Auto Rating Agency Trends vs.. Industry Aggregate Data:

AY	Earned Premium	Selected Default Rate Change	Selected Premium Exposure Trend	Premium Index to 1995	Premium Level Adj Factor	On-Level EP
2002	21,870,259	15.0%	0.0%	1.219	1.128	24,661,310
2003	23,949,583	11.0%	0.0%	1.353	0.999	23,928,657
2004	24,586,757	2.0%	0.0%	1.380	0.940	23,116,907
2005	24,979,870	-2.0%	0.0%	1.353	0.940	23,491,171
2006		-5.0%	0.0%	1.285	0.974	
2007		0.0%	0.0%	1.285	1.000	

AY	Booked Ult Loss & ALAE	Selected Untrended Ult Loss & ALAE	Proposed Frequency Trend	Proposed Severity Trend	Loss Trend Factor	Trended Ultimate Loss	Untrended Ultimate Loss Ratio	On Level Ultimate Loss Ratio
2002	14,994,393	14,804,177	-4.5%	5.4%	1.420	21,027,461	67.7%	85.3%
2003	14,704,891	14,437,975	-4.5%	5.4%	1.412	20,382,840	60.3%	85.2%
2004	14,583,887	14,404,130	3.5%	6.4%	1.282	18,467,266	58.6%	79.9%
2005	15,338,420	15,299,215	1.7%	6.4%	1.184	18,118,764	61.2%	77.1%
2006			0.0%	7.0%	1.107			
2007			0.0%	7.0%	1.034			

Is the uptick in claims frequency indicated by the rating agency in line with industry results?

# Declines in Claim Frequency Are Consistent for All Injury Types Except Permanent Total Frequency at First Report



Sharp decrease in lost time frequency doesn't seem to apply to the larger permanent total claims, which hit excess of loss layers. Consider softening frequency decreases when experience rating excess layers.

## Are primary trends for a given line of business appropriate for excess of loss experience rating?

- Issue: What if the decrease in frequency is mostly due to smaller claims going away, but there is no drop in the frequency of larger claims?
- Standard Experience Rating Trend Procedure
  - Trend individual losses using primary severity trend
  - Slot trended losses to reinsurance layer – this accounts for the leveraged effect of trend
  - For a given year, sum all trended losses to the layer and adjust for frequency trend
- Primary loss cost should increase at a rate equal to the compounded effect of frequency and severity trend.
- Inflation has a greater impact of excess of loss layers. The proportion of gross loss ceded to a reinsurance layer (the **Excess Ratio**) should be increasing at a rate equal to the leverage effect of inflation for that layer.
- But if the decrease in gross frequency was due mostly to small claims going away, the excess ratio would be increasing at a rate even faster than the leveraged effect of trend.



## Can primary trends be used for excess of loss experience rating? Proposed Test

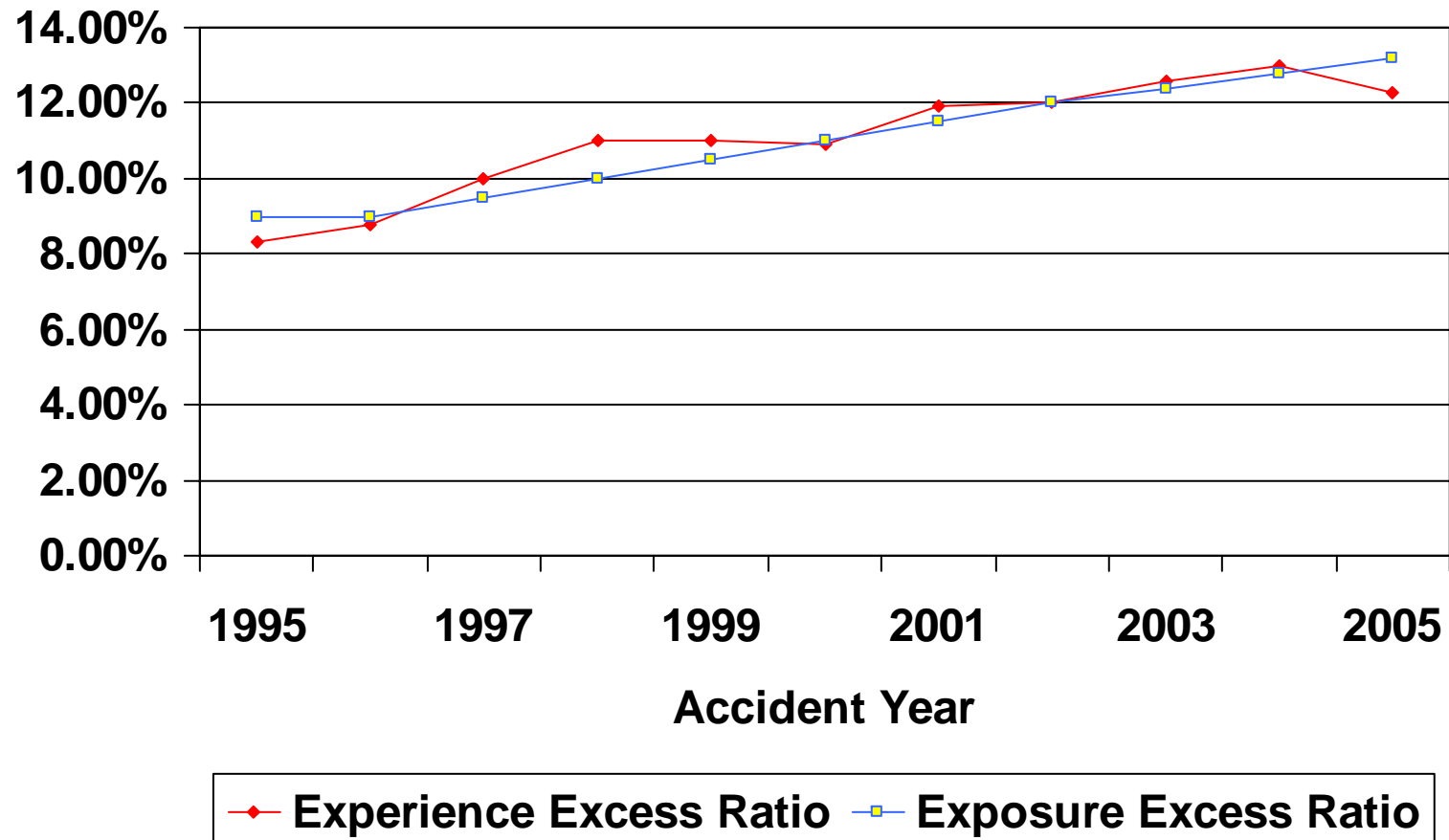
- Step 1: Buy ISO loss development layer for the appropriate line of business or develop a triangle of individual ground up claims
- Step 2: Determine ultimate losses by year for gross experience (limited to \$1 million) and for specified reinsurance layers
  - Assumption: Limit distribution is stable over time.
- Calculate the following **Experience Excess Ratio** over time:
  - **Experience Excess Ratio** = (Ultimate Loss to Layer i) / Ultimate Gross Loss Limited to \$1 million
- Test: **Experience Excess Ratio** should be increasing at a rate similar to **Exposure Excess Ratios** determined by detrending selected ISO ILF curves
- Determining **Exposure Excess Ratios**
  - For each historical year, detrend the selected Mixed Exponential Curve Mean by your selected annual gross severity trend factor
  - For each year calculate the following:  
**Exposure Excess Ratio** = (LEV (Limit + Att Point) – LEV (Att Point)) / LEV (\$1 million)
- If **Experience and Exposure Excess Ratios** are increasing at a similar rate, it indicates that primary trends are appropriate for use in excess of loss experience rating.

## Sample Calculation for GL Prem-ops 500x500K

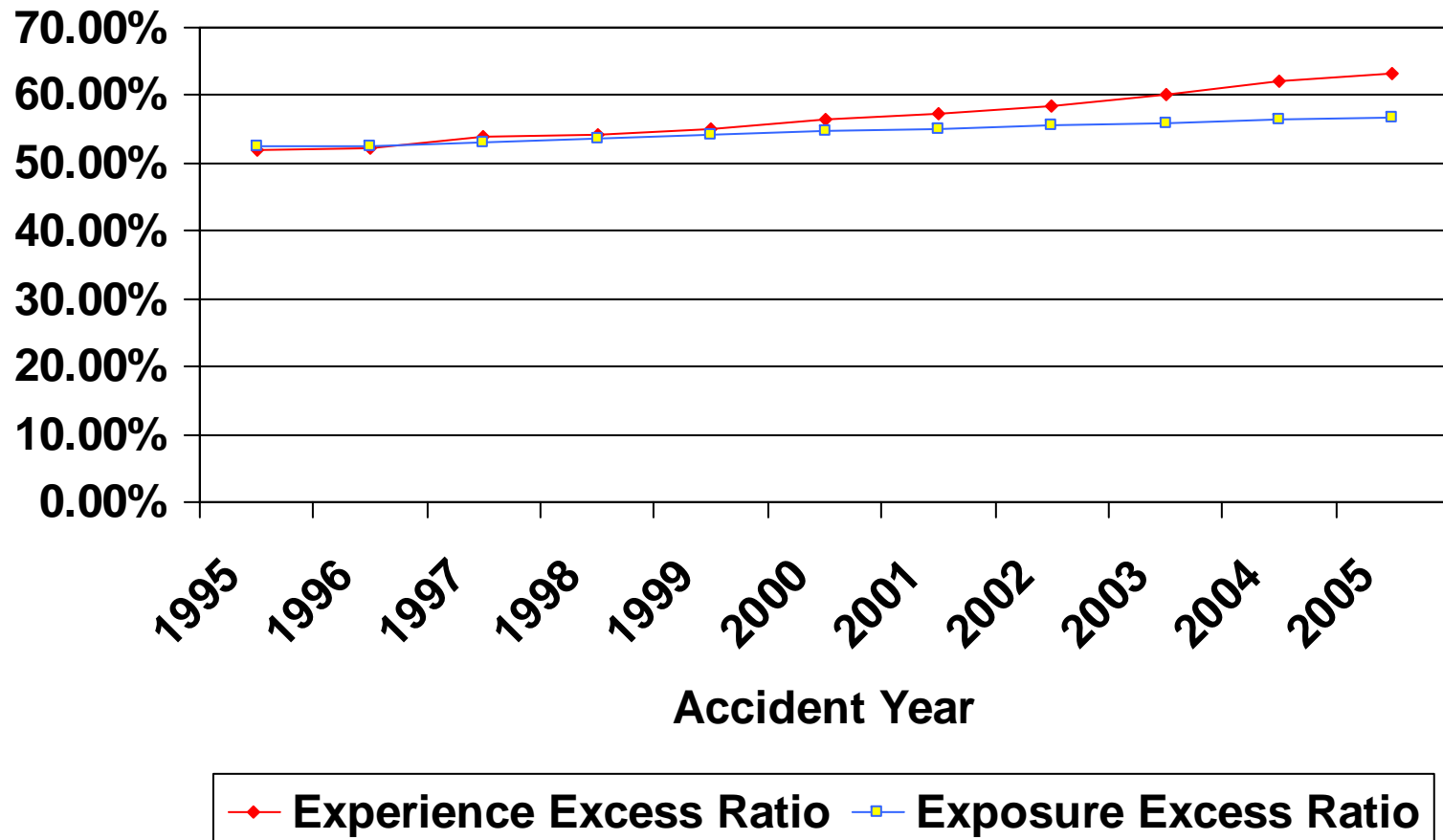
	Ultimate Loss			Exposure
	ISO	ISO	ISO	Excess Ratio
	Gross	Losses	Experience	Determined by
	Losses	\$500K xs	Loss to Layer	Detrending
	Limited	\$500K	as a Percent	Selected ILF
AY	to \$1 mil	Layer	of Primary	Curves
1995	3,595,513	296,917	8.3%	9.0%
1996	3,853,464	340,288	8.8%	9.0%
1997	4,125,522	412,214	10.0%	9.5%
1998	4,145,756	455,031	11.0%	10.0%
1999	4,500,225	494,496	11.0%	10.5%
2000	4,390,687	478,120	10.9%	11.0%
2001	4,107,087	486,815	11.9%	11.5%
2002	3,663,815	438,971	12.0%	12.0%
2003	3,701,664	466,217	12.6%	12.4%
2004	3,740,510	486,065	13.0%	12.8%
2005	3,735,534	458,944	12.3%	13.2%
	Ten Year Average:		3.6%	4.4%
	Five Year Avg Excl 2005:		4.2%	3.9%

Observation: Use of primary trends for experience rating seems reasonable for this layer.

## Sample Calculation for GL Prem-ops 500x500K – Based on ISO Loss Development by Layer Data



## Sample Calculation for GL Prem-ops 475Kx25K – Based on ISO Loss Development by Layer Data



Observation: Excess Ratios are increasing at a rate faster than expected for this layer. Consider softening frequency decreases when rating lower layers.

# Impact of Economic Crisis on Loss Trends: Food for Thought



## Property

### ➤ Exposure trends

- Insured values could be relatively stable, but there may be increased pushback on valuations by the buyer in order to save money

### ➤ Frequency trends

- Frequency could rise due to owners spending less money for risk management and building maintenance
- Theft or fire in vacant properties could lead to increased frequency since no one is around to keep an eye on the property
- Fraud or arson could be on the rise as business owners look to insurance to solve their problems

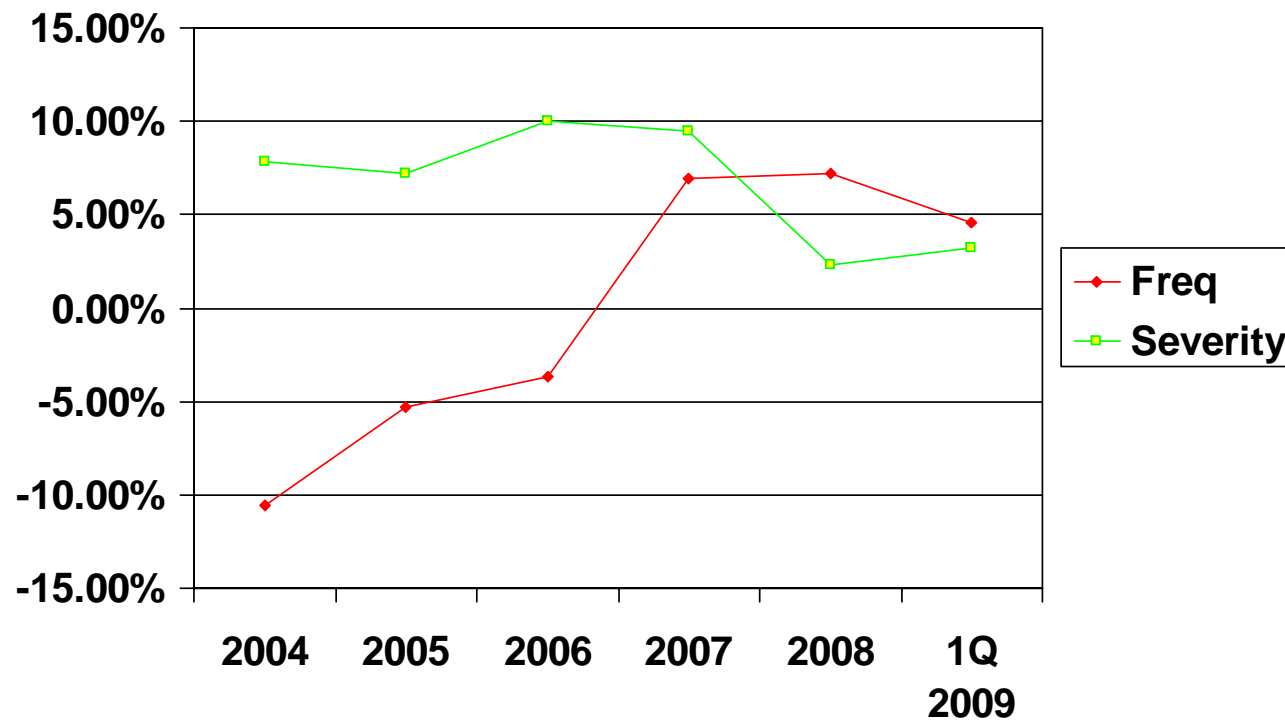
### ➤ Severity trends

- Cost of replacement materials could be relatively cheaper if in abundant supply
- Labor needed to replace or repair a building could be cheaper
- BI losses could be lower as business income has waned

### ➤ Other possibilities

- As buyers seek to save money, may increase deductibles or buy lower BI limits

## Early Indications: Allstate Homeowners Data



- Frequency has gone from being sharply negative to positive as the housing market and economy worsens
- Severity trend has decreased as the economy softened

# Workers Compensation

## ➤ Exposure trends

- Decreased payroll driven by fewer employees and shortened work weeks
- Hardest hit industries are construction, manufacturing, high end restaurants, hotels

## ➤ Frequency trends

- Leading driver in a depressed economy
- Frequency tends to sharply decline due to less experienced workers being let go; they tend to have the most workplace injuries
- Fewer miles driven and fewer construction projects carve out the major WC exposures
- Shorter work weeks and reluctance to file a claim for fear of losing job

## ➤ Severity trends

- If frequency decrease is greatest for smaller claims, average severity increases – largely explains why indemnity severity has been persistently higher than wage trend in recent years.
- Medical severity trend remains high, despite the recession, especially in California

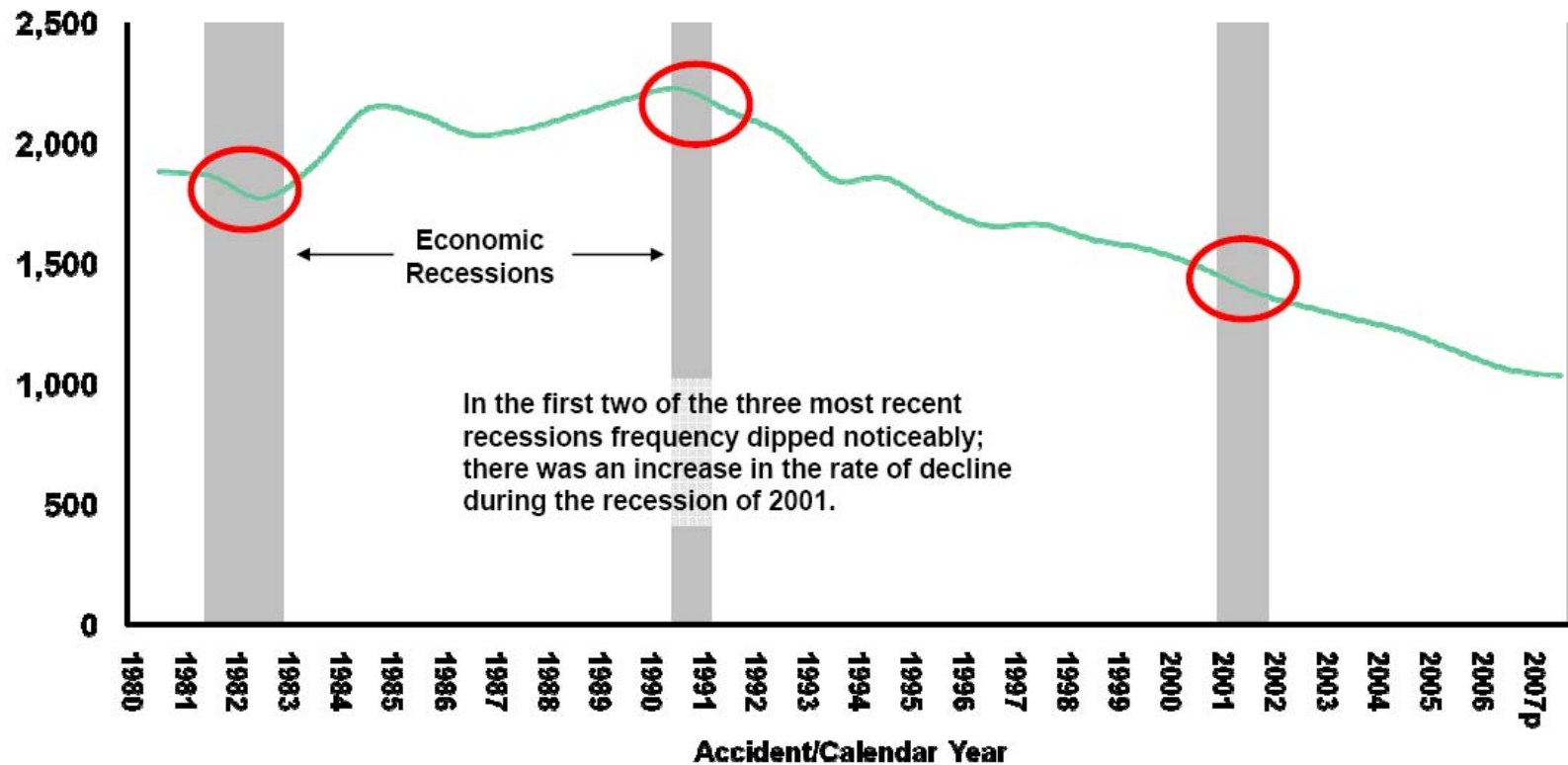
## ➤ Other things to think about

- Tough to encourage a “return to work” program when there are no jobs to return to
- Moral hazard for some employees who think they could be let go and decide to file a WC claim (statistics do not really support this)



# NCCI Lost-Time Claim Frequency

Claims per 100,000 Workers

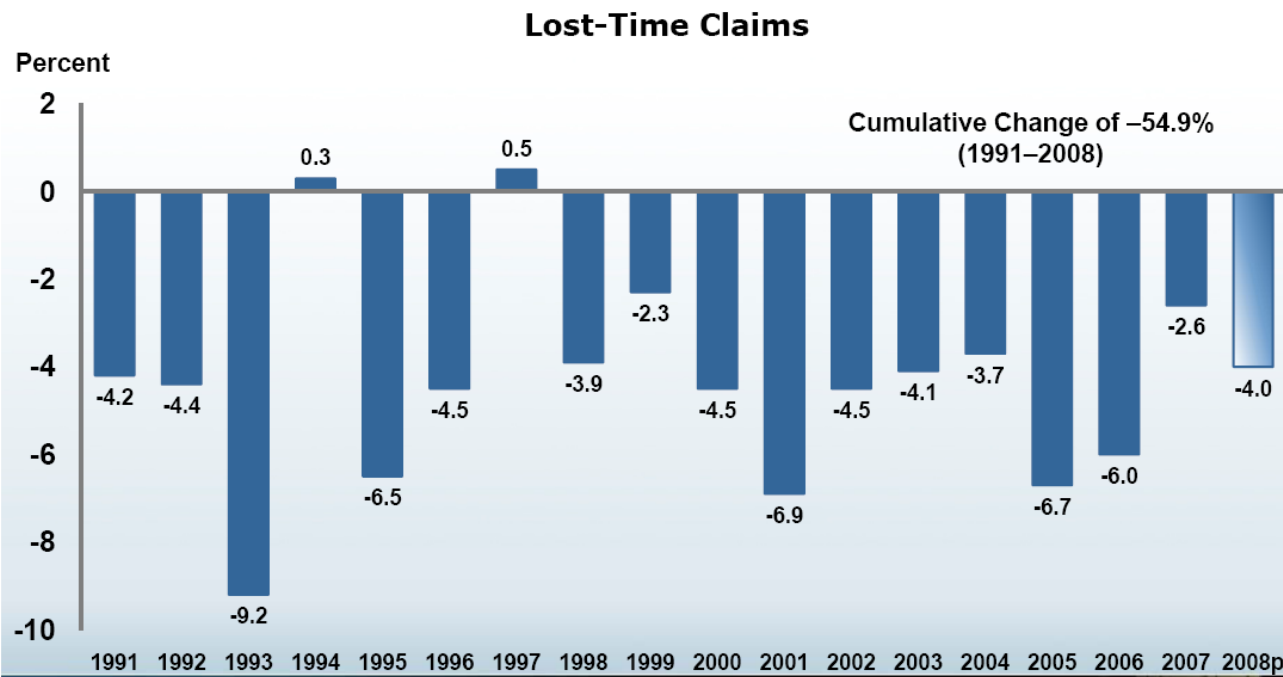


2007p: Preliminary based on data valued as of 12/31/2007  
 1980–2006: Based on Financial Call data, developed to ultimate  
 Based on the states where NCCI provides ratemaking services  
 Excludes the effects of deductible policies

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## WC Frequency Decreases Accelerated in the First Year of this Recession

### Workers Compensation Lost-Time Claim Frequency Continues to Decline



2008p: Preliminary based on data valued as of 12/31/2008

1991–2007: Based on data through 12/31/2007, developed to ultimate

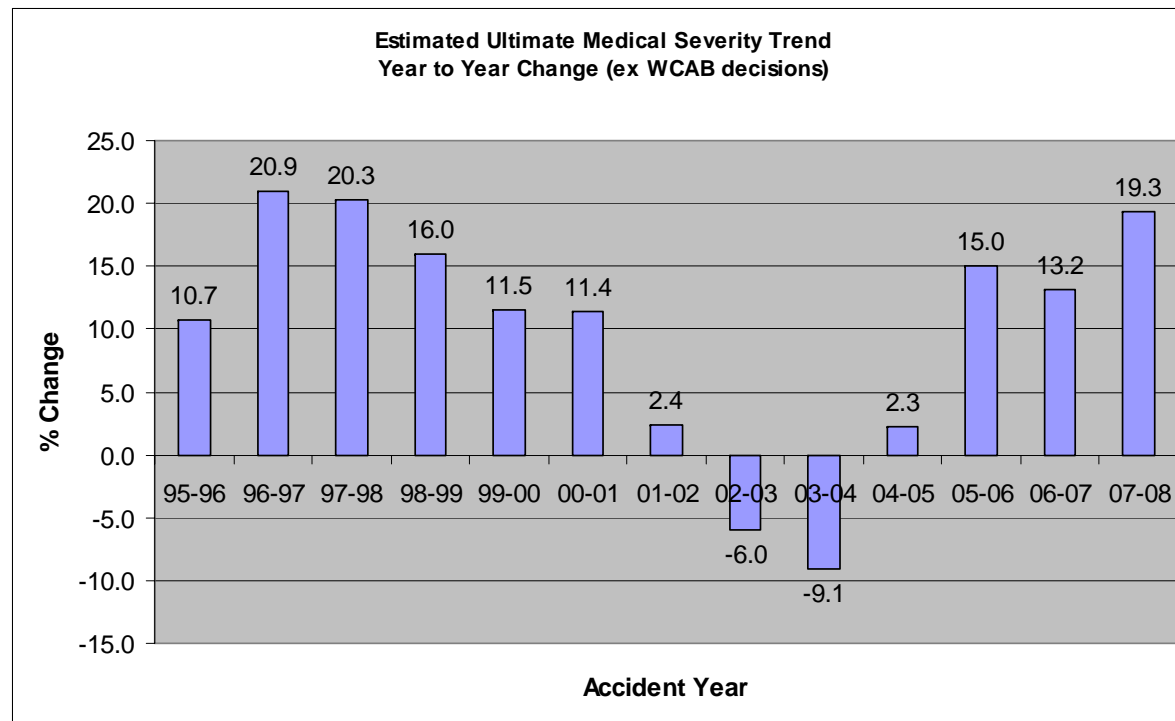
Based on the states where NCCI provides ratemaking services, including state funds; excludes high deductible policies

Frequency is the number of lost-time claims per 100,000 workers as estimated from reported premium

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## Medical Severity Remains Scary – WCIRB California WC Statistics



➤ Reasons for sharp increases:

- Increased use and cost of medical tests
- Increased number and costs of prescriptions per injured worker
- Billed medical fees growing as a percent of amounts per fee schedule – particularly an issue for states with successful reforms
- Increased cost of utilization review.

➤ NCCI WC Avg Severity Increase for 2008 is 6% versus a 3.7% increase in Medical CPI.

## Auto Liability

### ➤ Premium Volume

- Down as consumers increase deductibles and don't buy physical damage coverage to save money
- Personal Umbrella: Volume is down as some consumers decide to stop buying it.

### ➤ Frequency

- Sharp drop in frequency in 2008 due to the combined effect of sharply rising oil prices and the beginning of the recession
- Early evidence shows frequency decreases may flatten out in 2009 as the decrease in oil prices seems to be offsetting the softening economy.
- Special Considerations for Trucking
  - Less experienced drivers are let go during layoffs (should reduce frequency)
  - But cost cutting measures could put risk management and vehicle maintenance on hold

### ➤ Severity

- Hard to tell, general inflation is down, but medical costs still seem to be increasing
- Social inflation could rise due to the change to a democratic administration and more sympathy for the "little guy"

## Auto Liability – Early Evidence

### Motor Oil Consumption Energy Department Statistics

Month	National Avg Retail Price Per Gallon	Change in Consumption from Prior Year
1/08	\$ 2.54	-0.8%
2/08	\$ 2.55	-1.8%
3/08	\$ 2.76	-1.2%
4/08	\$ 2.96	-1.1%
5/08	\$ 3.30	-2.3%
6/08	\$ 3.54	-4.4%
7/08	\$ 3.54	-5.9%
8/08	\$ 3.25	-5.1%
9/08	\$ 3.20	-8.5%
10/08	\$ 2.51	-2.7%
11/08	\$ 1.58	-3.7%
12/08	\$ 1.20	-3.6%
1/09	\$ 1.33	-1.4%
2/09	\$ 1.45	-0.3%
3/09	\$ 1.50	-0.9%
4/09	\$ 1.59	-0.9%

### Allstate Standard Auto Statistics

Calendar Period	Change in BI Freq	Change in BI Severity
2008	-8.5%	6.7%
1Q2009	5.5%	2.1%

- Statistics still early, GEICO showing small frequency decrease in 1<sup>st</sup> qtr, weather was also worse than avg in 1Q2009
- Hard to take 1 quarter of calendar year paid avg severity too seriously

## General Liability

### ➤ Exposure trends

- Revenue / payroll will likely shrink in a depressed economy, OL&T exposures likely down less
- Construction suffering tremendously, although stimulus will help – some clients noted premium for construction classes down as much as 20%

### ➤ Frequency trends

- In past recessions we've seen an uptick in frequency for contractors perhaps due to:
  - Temptation to work outside their expertise in order to stay busy
  - Financial stress of contractor may lead to work product suffering  
Risk management / loss control could suffer due to cost cutting initiatives
- Products & Completed Operations:  
Premium Exposure Base is sales, which are decreasing  
But true exposure to loss is products in use, which is not decreasing; thus, frequency could rise.

### ➤ Severity trends – Unclear for same reasons as auto

- Will take many years to play out due to impact of calendar year trend on loss development

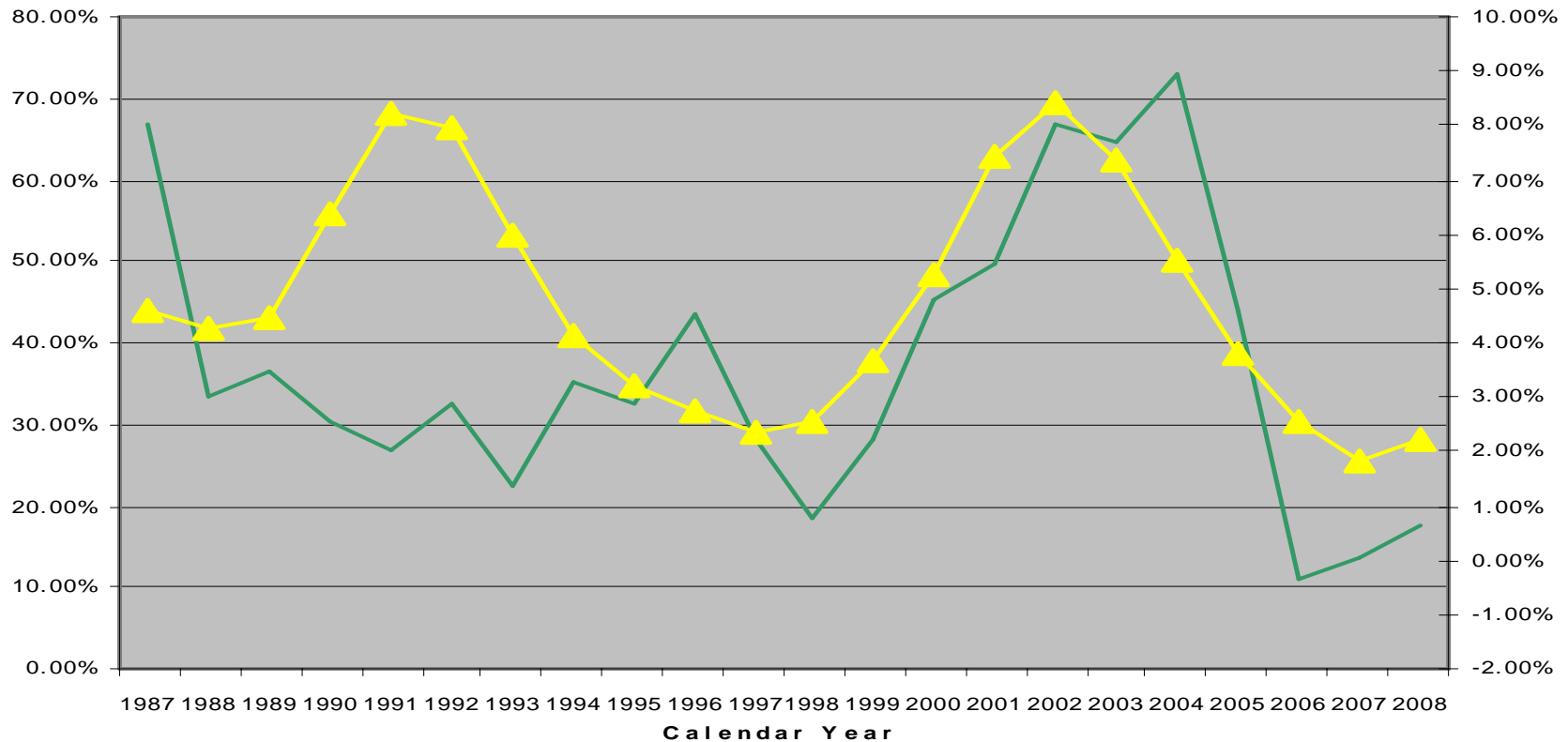
### ➤ Other observations

- Could see some lift in premium "rate" due to minimum premiums, short term cancellations, and unaudited lines of business like umbrella

## Surety

- Contract surety provides a guarantee to project owners that contractor will meet obligation to complete a job.
- Financial stress is the main (but not only) cause of loss
- The construction sector is suffering more than most other sectors
  - Unemployment in the construction industry was up to 21% in March from 12% last year
- Surety results were horrible during the recession of 2001 and 2002.
- Reasonable Conclusion: The worldwide economic crisis will lead to horrendous surety results.
- Reasons for hope
  - Due to solid underwriting surety results did not suffer materially during the recession of 1990 to 1991
  - Material costs are lower than when many jobs were bid providing some cushion to contractors
  - Contractors have been sharply cutting expenses as shown by the increased unemployment in that sector
  - Loss activity during this recession has been relatively modest so far.
- Conclusion: Poor results are not certain, but the risk is significant

## Correlation of Surety and Speculative Default Rates

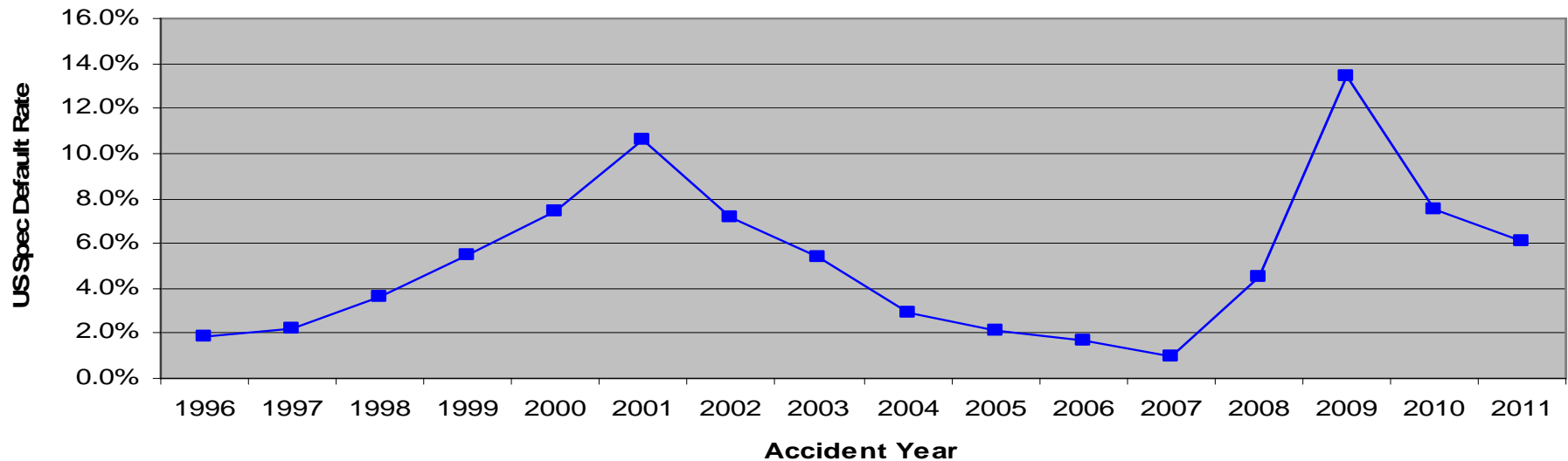


Green Line: Surety Industry Calendar Year Loss Ratios

Yellow Line: Speculative Default Rates



## Historical and Projected US Speculative Default Rates

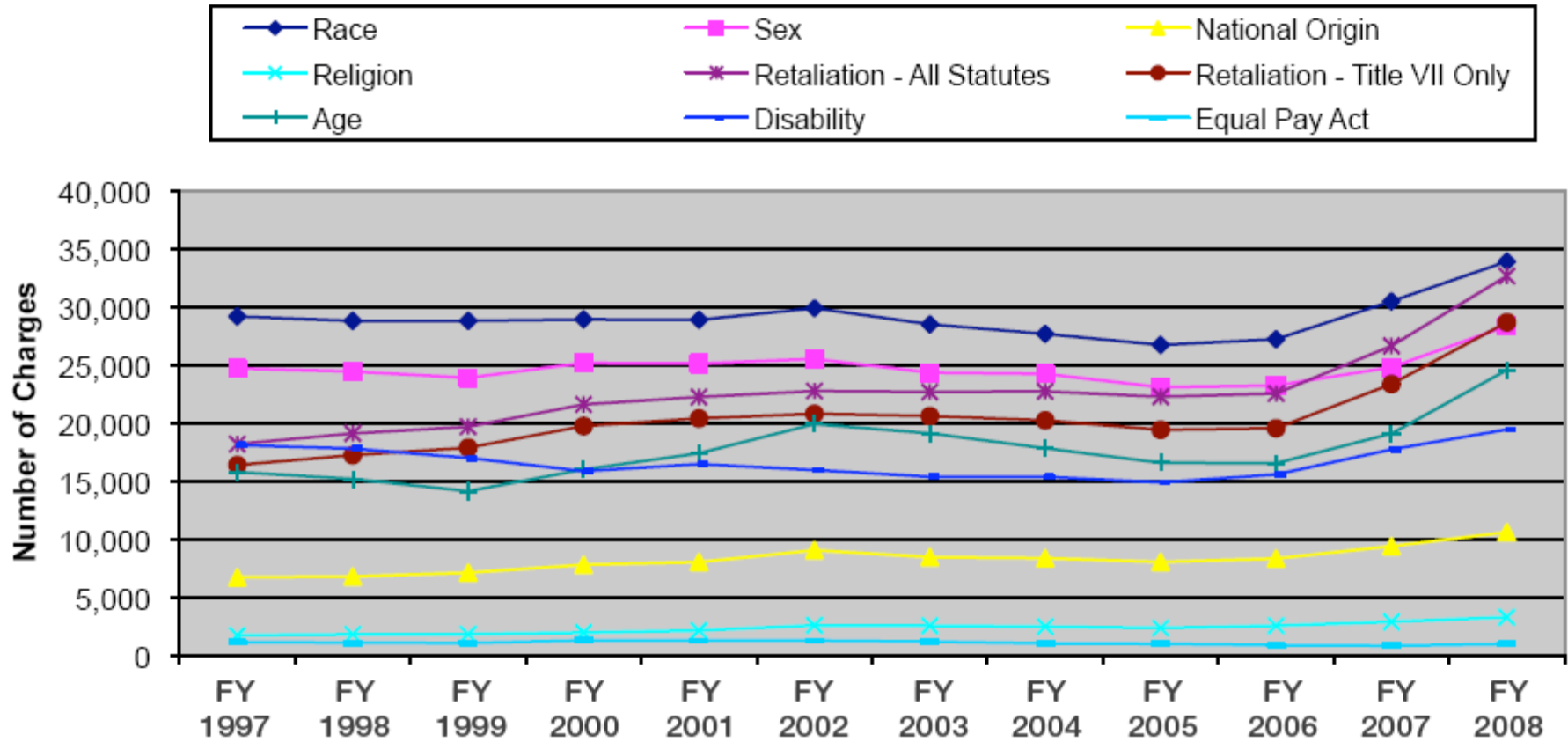


- Moody's expects default rates to increase dramatically until 4Q09 and then begin declining.
- 2009 estimate is from Moody's but 2010 and 2011 are just guesses based off of a downward trend in Moody's estimates for the 1Q2010.
- Questions:
  - Will construction be impacted more or less than other industries?
  - What effect will the stimulus plan have on Surety results?

## Professional Liability

- **“A number of large financial losses have occurred, the next step is to find incriminating circumstances to trigger coverage”, Kevin Rooney, Endurance Re underwriter**
- **D&O – Economic Crisis is more of an event than a trend.**
  - Security Class Action Suits: 2006: 119, 2007: 176, 2008: 224, 2009 YTD: 75 (200 annualized)
  - Severity should be high due to the huge losses suffered by investors.
  - Top plaintiff lawyers said he has been focusing on FI, but will get back to commercial when he has time.
- **E&O**
  - We would expect an increase in frequency on lawyers, accountants, real estate, security brokers & financial planners, appraisers, etc.
  - More Ponzi schemes such as Madoff and Stanford should be exposed causing more E&O liability.
- **Fidelity**
  - Bad economy typically leads to more employee theft
  - FI Fidelity: Seeing more claims alleging loan losses (or bad investments) are due to corrupt loan officers and other employees
- **EPLI and Non-Public D&O**
  - Lilly Ledbetter Act overturned Supreme Court ruling that applied a strict 180 day statute of limitation on suits.
  - Increased unemployment usually causes more EPLI suits, which seems to be happening today.
- **FI rates are up, but commercial D&O, E&O, EPLI, and Fidelity rates are still flat to decreasing**

## EEOC Charge Statistics: 1997 to 2008



## Concluding Comments

- Need to validate that various trends fit historical experience and are equally applicable for pro-rata and excess of loss business
- Global recession will have a major impact on trends that could vary by line of business
- Future Inflation
  - Some experts see a big spike in inflation as a result of the massive government deficits and monetary loosening used to fight the recession
  - Others see a risk of deflation due
    - Deleveraging of US consumers and financial institutions will cause a long term decrease in demand
    - Huge amount of spare manufacturing capacity built up by a boom fueled by debt
- Greater uncertainty in loss trends impacts reserves as well as prospective business
- Need to consider methods that take into account the cost of this risk being assumed