ANTITRUST Notice

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National Council on Compensation Insurance, Inc.

Trends and Breakpoints in Workers Comp Loss Costs: What Makes Medical and Indemnity Different?

Presented by
Harry Shuford

CAS Ratemaking and Product Management Seminar
Trends in Workers Compensation Medical Costs
March 21, 2011
New Orleans, Louisiana

Trends and Breakpoints in WC Loss Costs

What's Different About Medical and Indemnity Loss Cost Trends?

Looking at the Pieces:

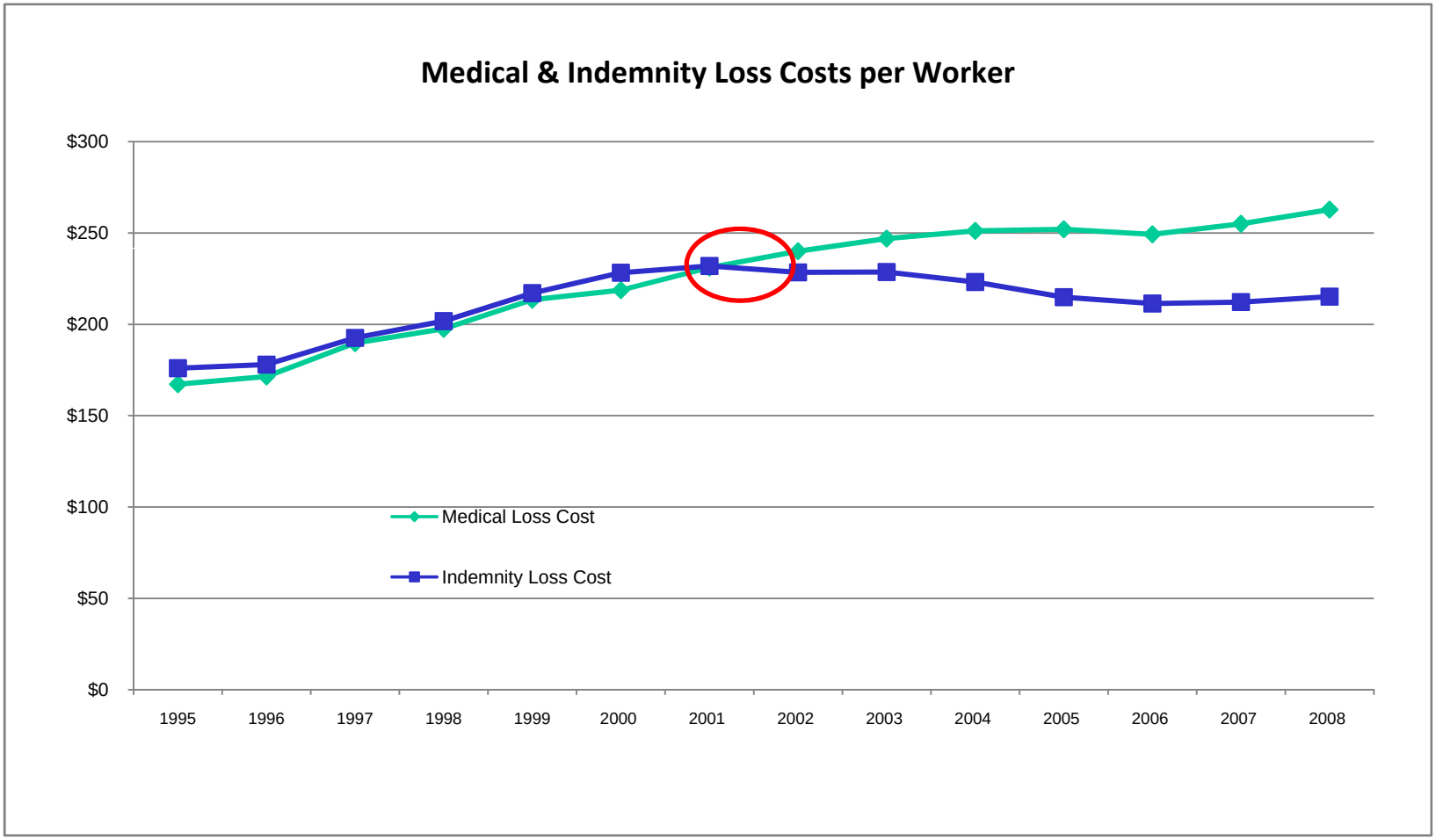
- **Loss Costs**
  - **Frequency**
  - **Severity**
    - **Price**
    - **Utilization**

Tracking Trends in Loss Costs

Loss Costs per Worker

Medical & Indemnity

WC Loss Cost Trends
Medical & Indemnity Seem to Diverge around 2001
Cost per Worker

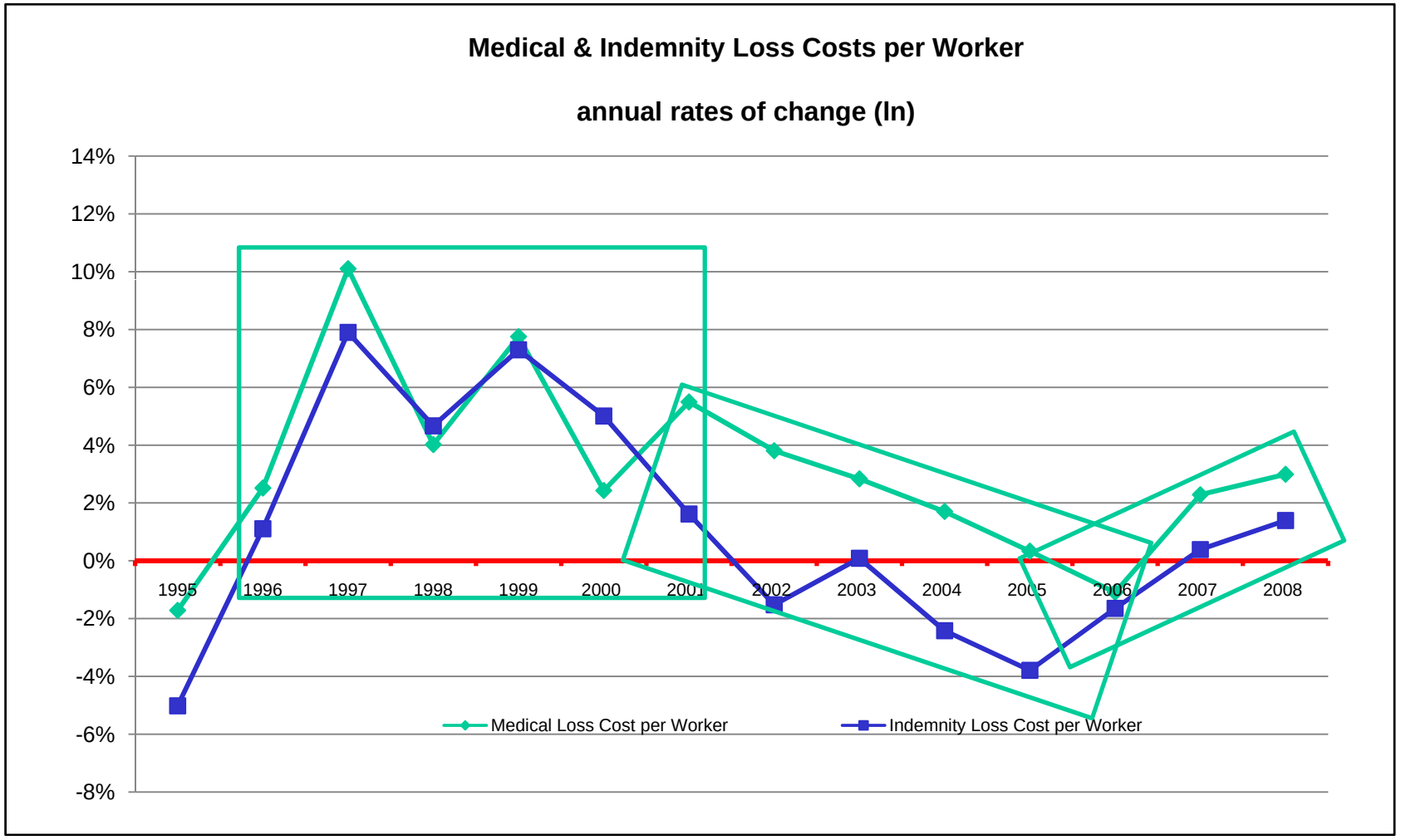


Tracking Trends in Loss Costs

Rates of Change in Loss Costs per Worker

Medical & Indemnity

Medical & Indemnity Loss Cost Trends
Rates of Change Seem to Follow a Similar Pattern
Cost per Worker



Medical and Indemnity Loss Costs - The Pattern:

1997 - 1999: Strong Growth

2000 – 2001: Easing Growth

2002 – 2006: Limited Growth

Tracking Trends in Loss Costs

Frequency Trends

National Council on Compensation Insurance, Inc.

Tracking the Decline in Frequency of Workplace Injuries

Can We Identify the Drivers?

Harry Shuford, PhD
Practice Leader and Chief Economist

CAS Ratemaking Seminar - WC-4:
Key Drivers of Workers Compensation Costs - Economic Perspectives
March 8, 2007
Atlanta, GA

A Statistical Model to Quantify Frequency

Predicting Changes in Frequency of Workplace Injuries—Manufacturing

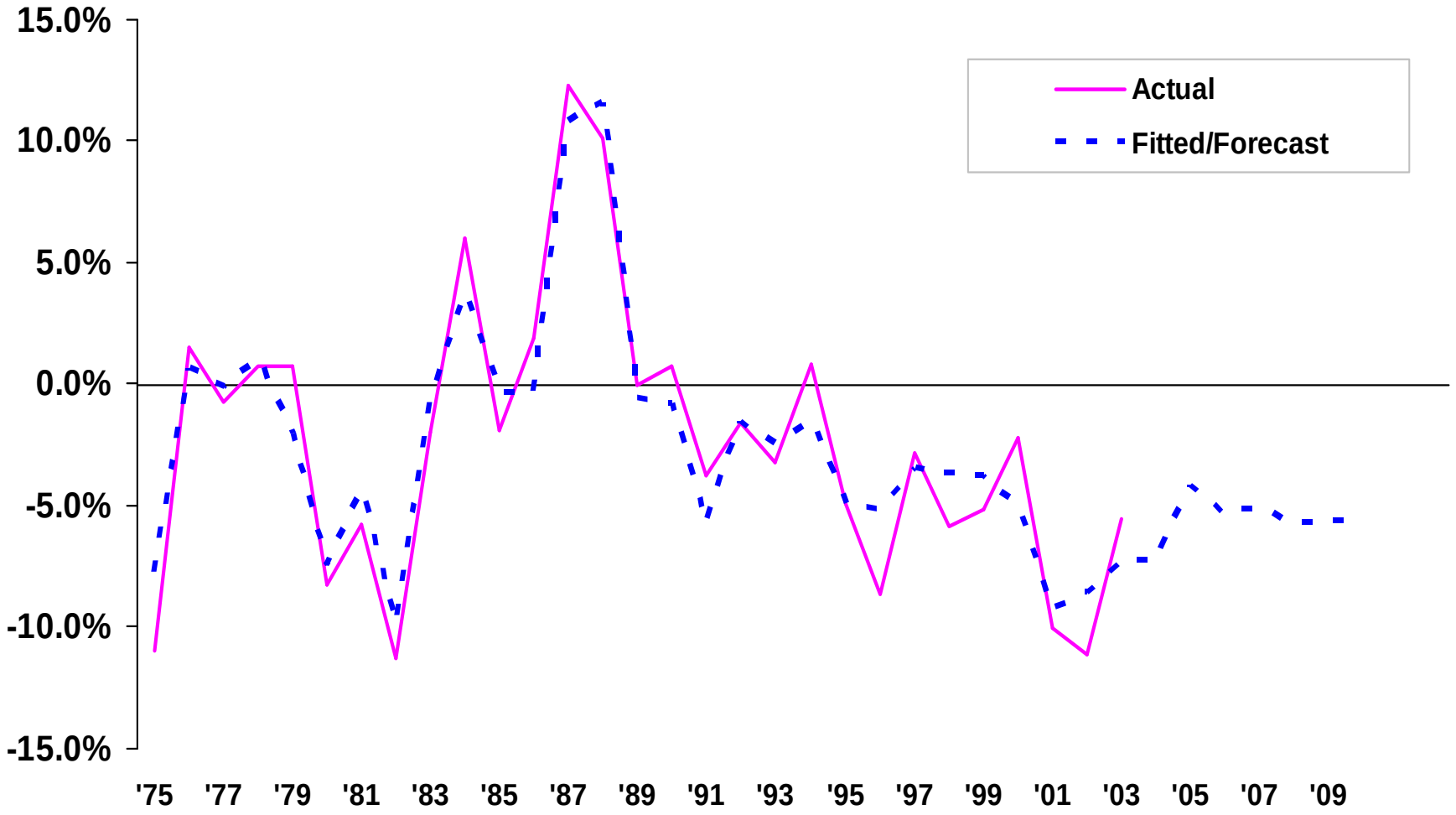
1948-2003

Factor	Trend	Unemployment rate (change)	Younger Workers (share of labor force)	Reporting anomaly (1986/1987)
Result	Declining	Unemployment up, frequency down	More younger workers, frequency up	Frequency increase overstated
Significant?	99%	99%	95%	99%

Modeling the Change in the Log of the Incidence Rate of Injuries in Mfg.

	Trend	LDUNR	LDGDP	LDEMPSH	DUM	R2
Model 1	-0.0507	-0.1410	––	0.6144	0.1007	0.647
t value	(-3.03)	(-5.99)	––	(2.66)	(4.01)	
Model 2	-0.0920	––	1.2724	0.469	0.1058	0.653
t value	(-4.93)	––	(6.19)	(1.92)	(4.28)	

Forecast of Percent Change in Manufacturing Incidence Rates



Source: U.S Bureau of Labor Statistics, NCCI

Frequency Is No Longer a Mystery

- Long Term
  - Economic forces drive frequency downward
  - This is likely to continue
- Short Term
  - Cyclical fluctuations in the number of inexperienced workers puts some upward pressure on frequency
  - This is likely to continue – short-term outlook is uncertain
- Young Workers Have Higher Frequency
  - This is becoming less significant

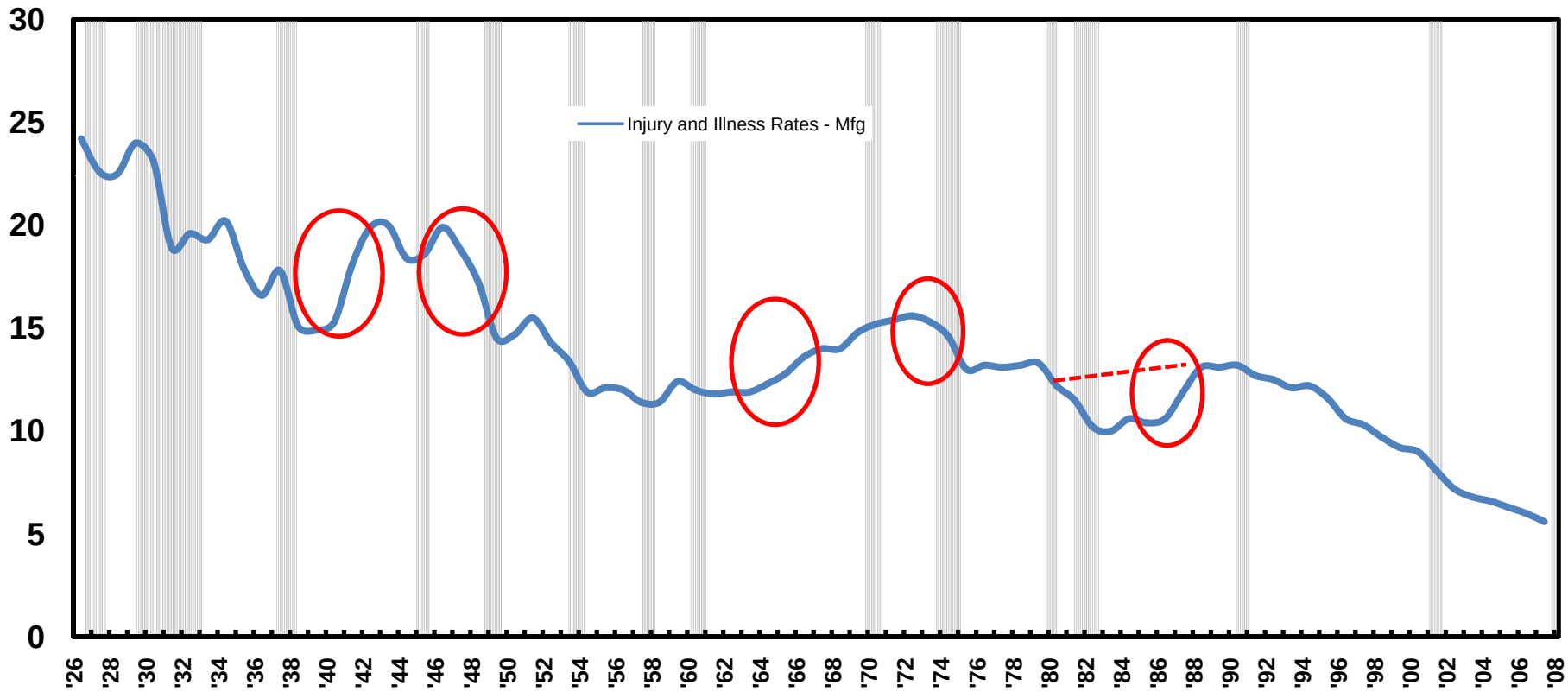
Tracking Trends in Loss Costs

Looking for the "Turning Point"

Breakpoints in Frequency Trends

Characteristics of Frequency:
Turning Points Along a Long-Term Drift Downward

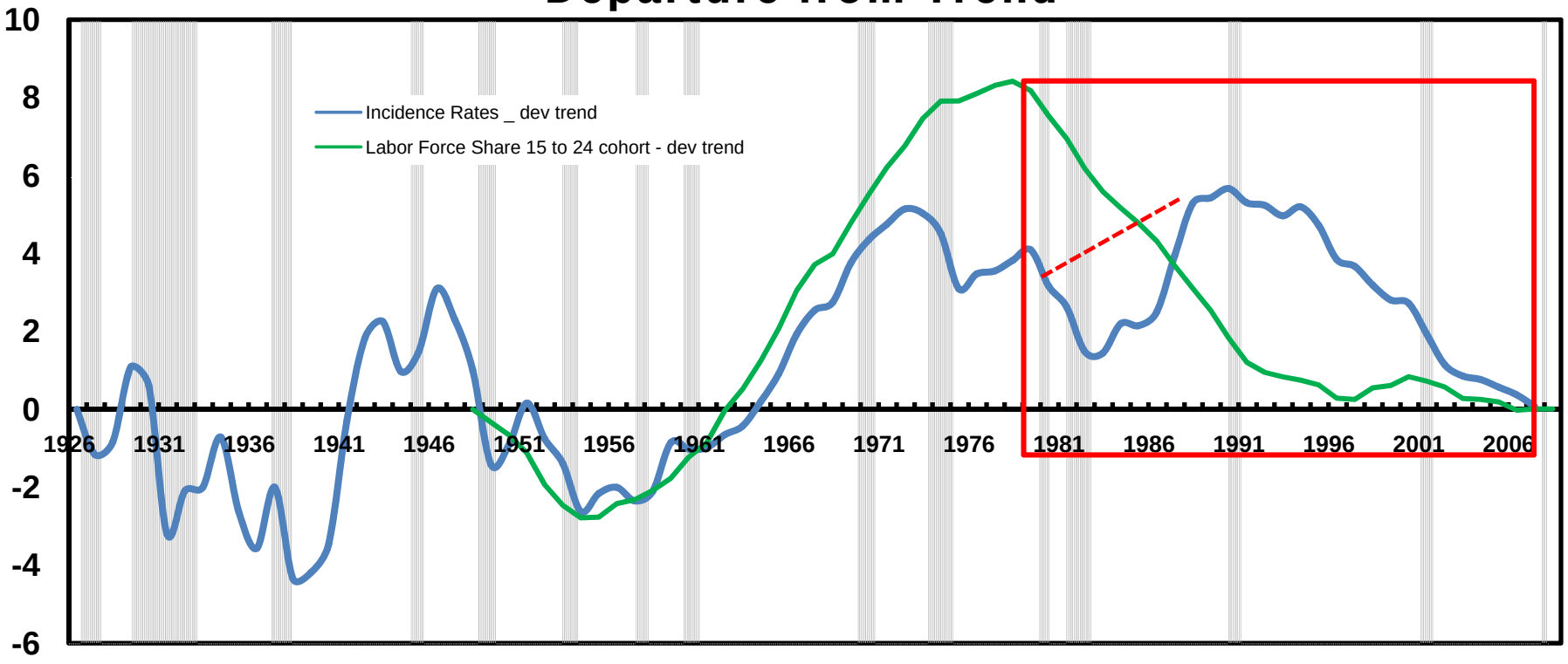
Manufacturing—Total Recordable Cases
Rate of Injury and Illness Cases per 100 full-time workers
Noting "Turning Points"



Note: Recessions indicated by gray bars
Source: U.S. Bureau of Labor Statistics; National Bureau of Economic Research

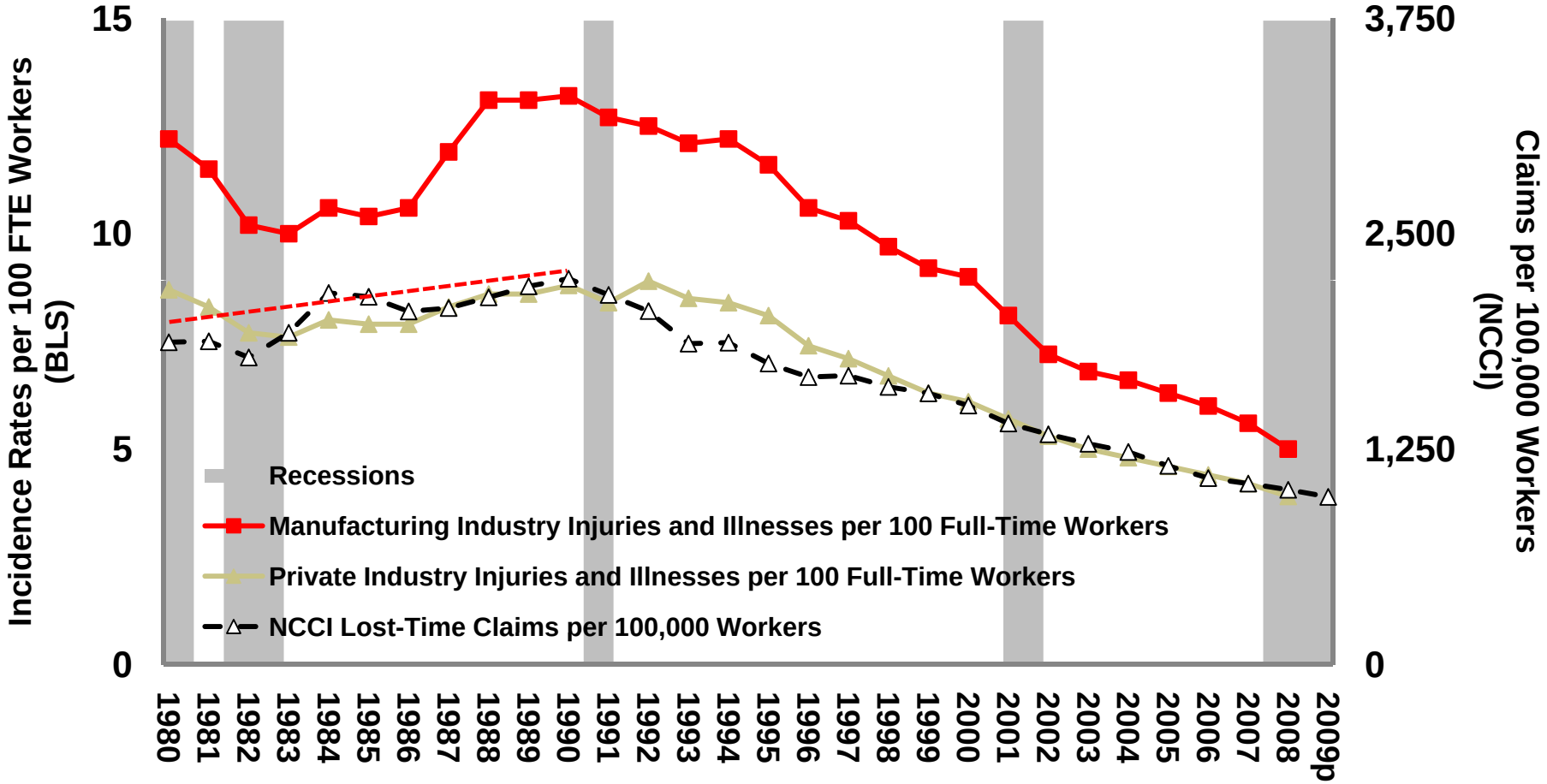
Characteristics of Frequency:
Turning Points Along a Long-Term Drift Downward

Manufacturing—Total Recordable Cases
Rate of Injury and Illness Cases per 100 full-time workers
Share of Workforce Aged 15 to 24
Departure from Trend

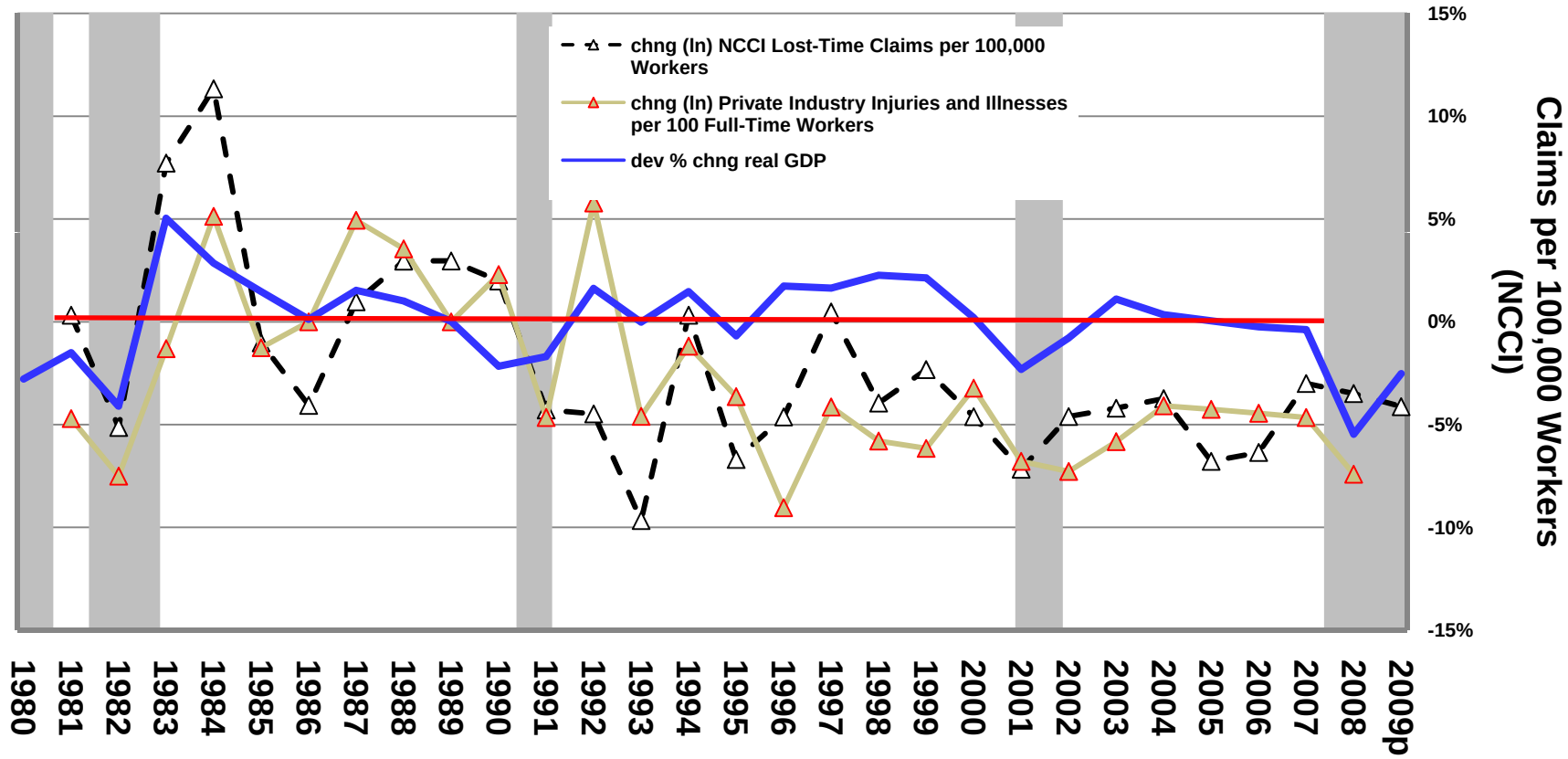


Note: Recessions indicated by gray bars
Source: U.S. Bureau of Labor Statistics; National Bureau of Economic Research

Workplace Injury Incidence Rates for Manufacturing Something Different in the 1980s



Workplace Injury Incidence Rates for Private Industry No So Different in the 1980s



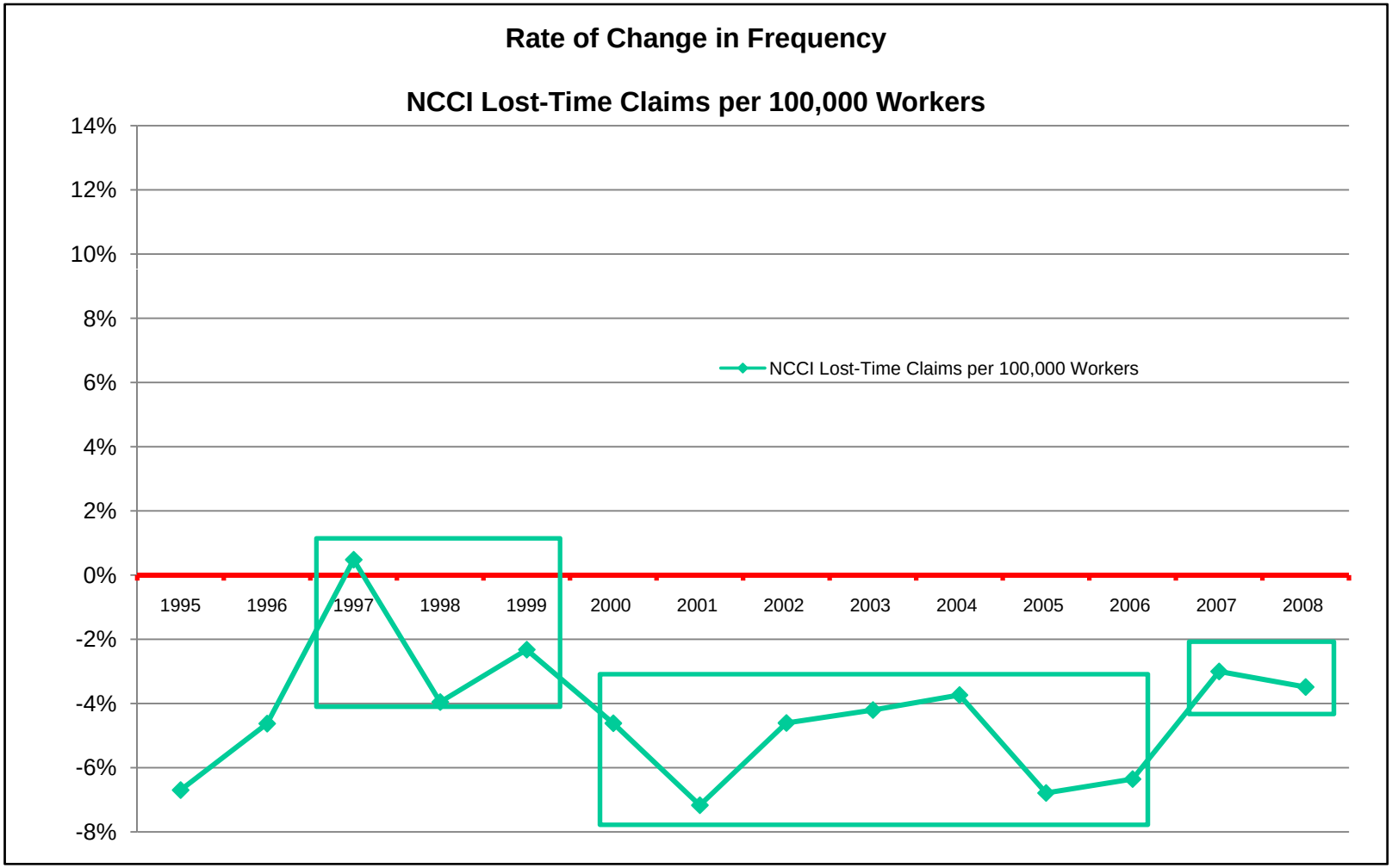
Tracking Trends in Loss Costs

Changes in Frequency

1995-2008

No Turning Point

WC Loss Cost Trends
Frequency per # Workers Typically Declined



Frequency Changes - The Pattern:

1995 - 1996: Marked Declines

1997 – 1999: Increase & Smaller Declines

2000 – 2006: Marked Declines

2007 – 2008: Smaller Declines

Tracking Trends in Loss Costs

Removing the Contribution of Frequency

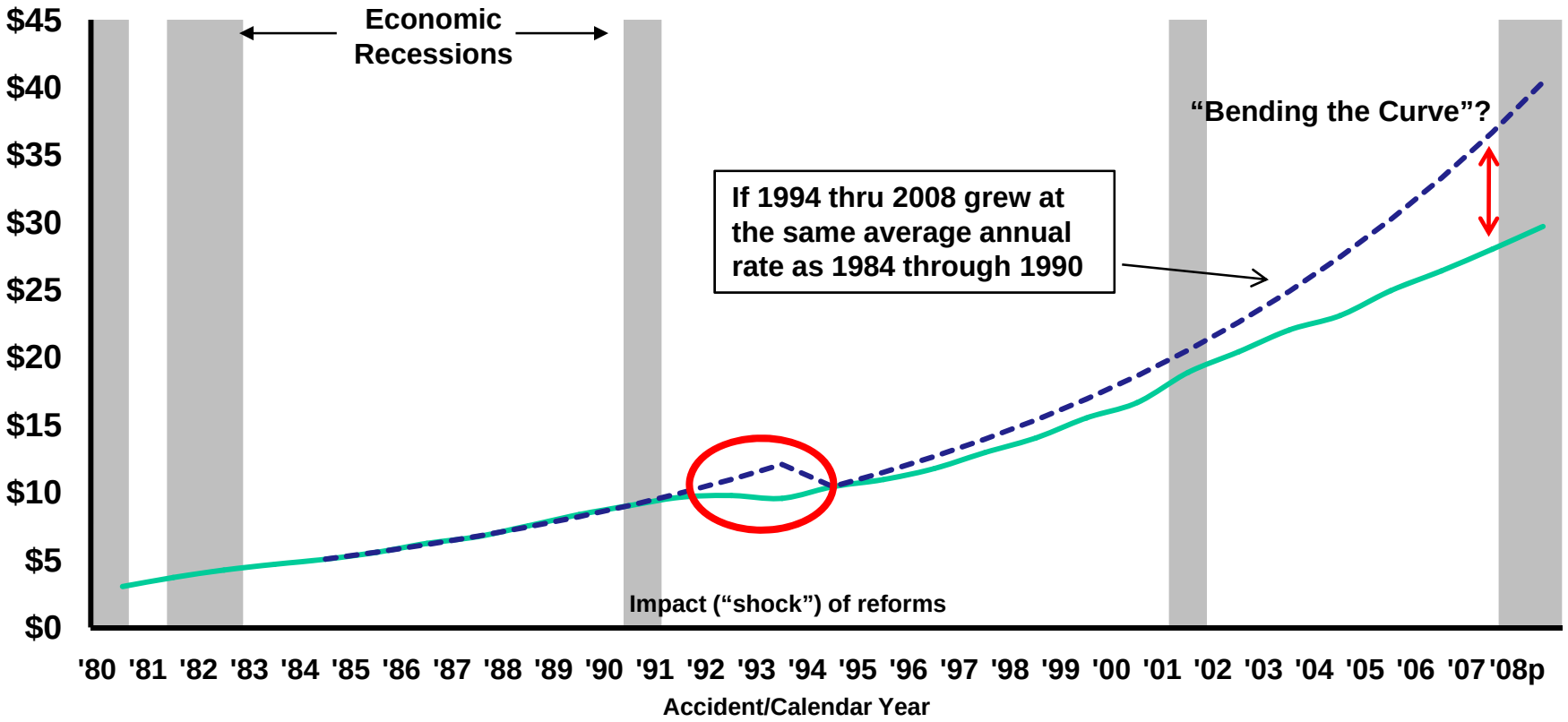
Medical and Indemnity Severity Trends

A Breakpoint in Workers Comp Severities

Impact of Reform in the Early 1990s

The Growth in Medical Severity Eased Following Reforms in Early 1990s

Medical Cost per Claim ($000)



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

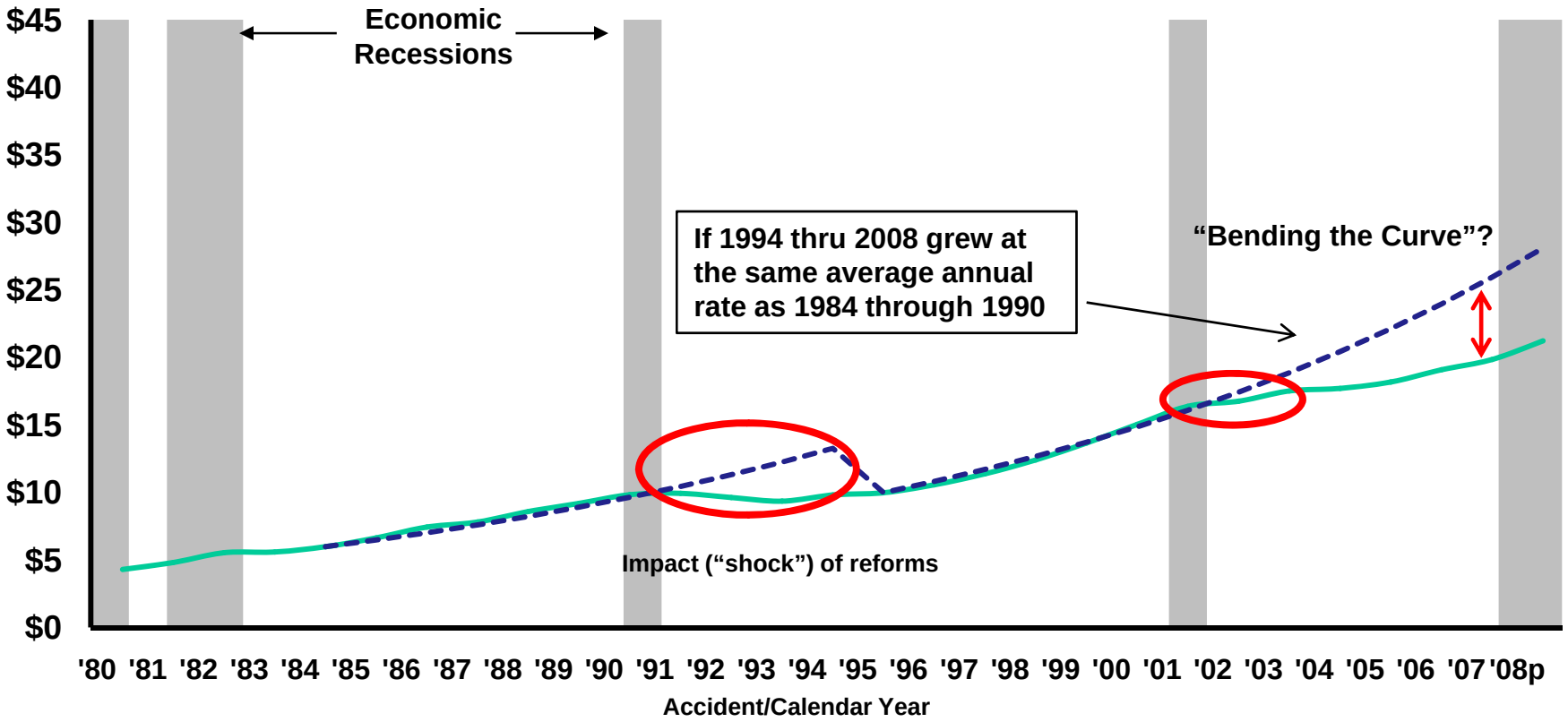
1991–2007: Based on data through 12/31/2007, developed to ultimate

Based on the states where NCCI provides ratemaking services, including state funds

Excludes high deductible policies

The Growth in Indemnity Severity Temporarily Flat Following Reforms in Early 1990s Marked Decline Starting Around 2002

Indemnity Cost per Claim ($000)



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Excludes high deductible policies

Workers Comp Severities

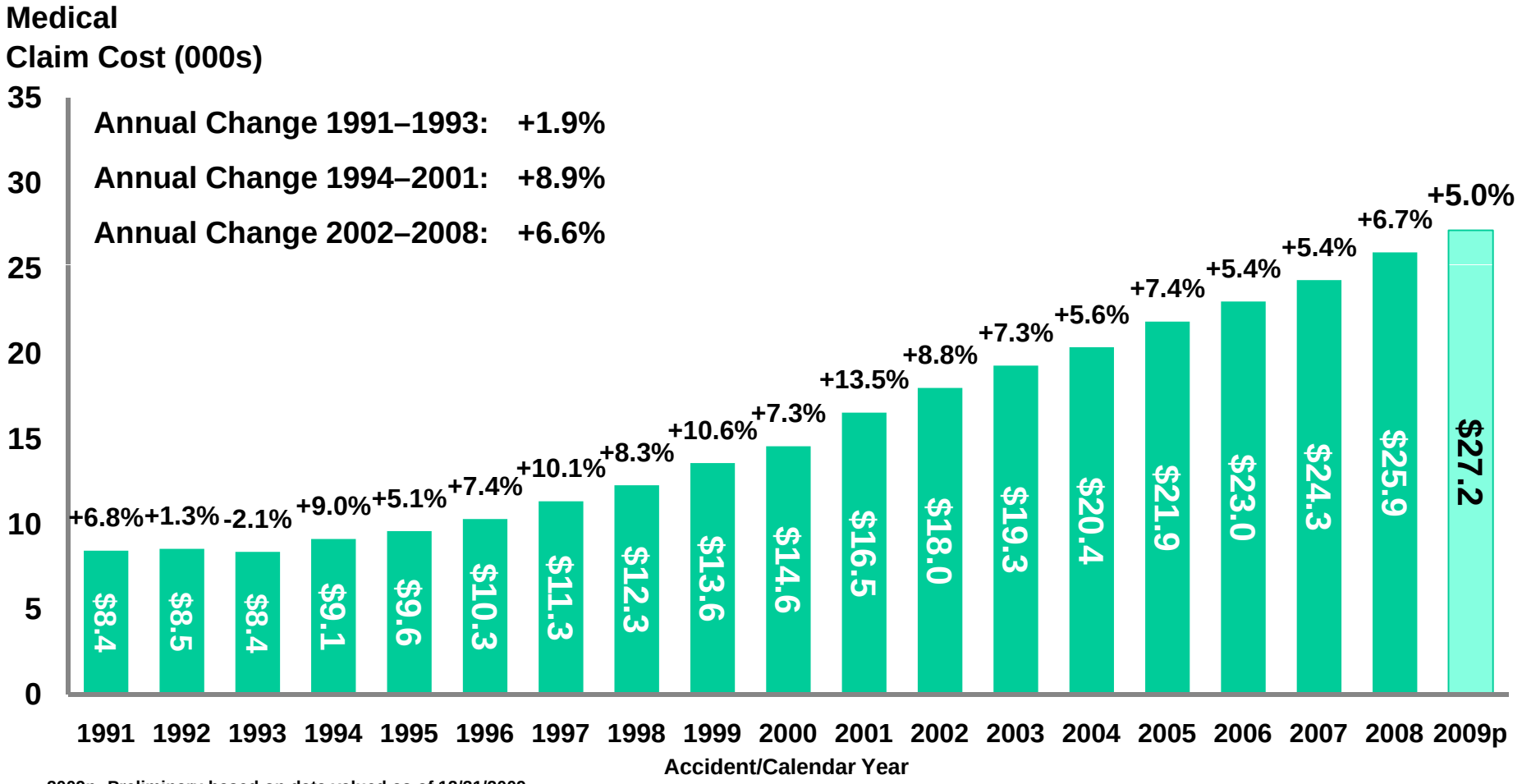
Two Decades of Post Reform Growth

Surprisingly Similar

Even Post 2001

WC Medical Claim Costs
Will Moderate Trends Continue?

Average Medical Cost per Lost-Time Claim



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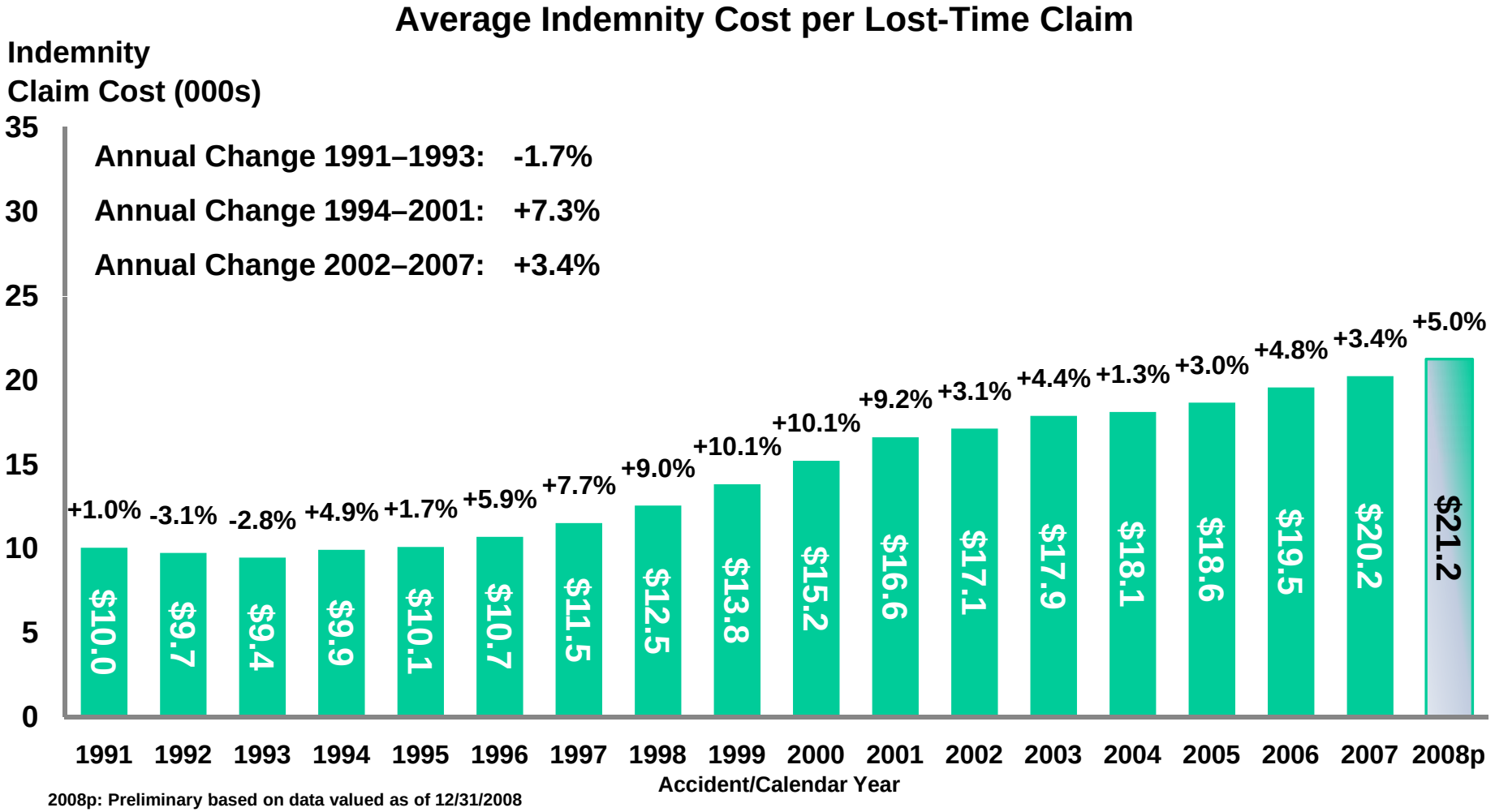
Excludes high deductible policies

Workers Compensation Indemnity Claim Costs Growth Has Eased



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

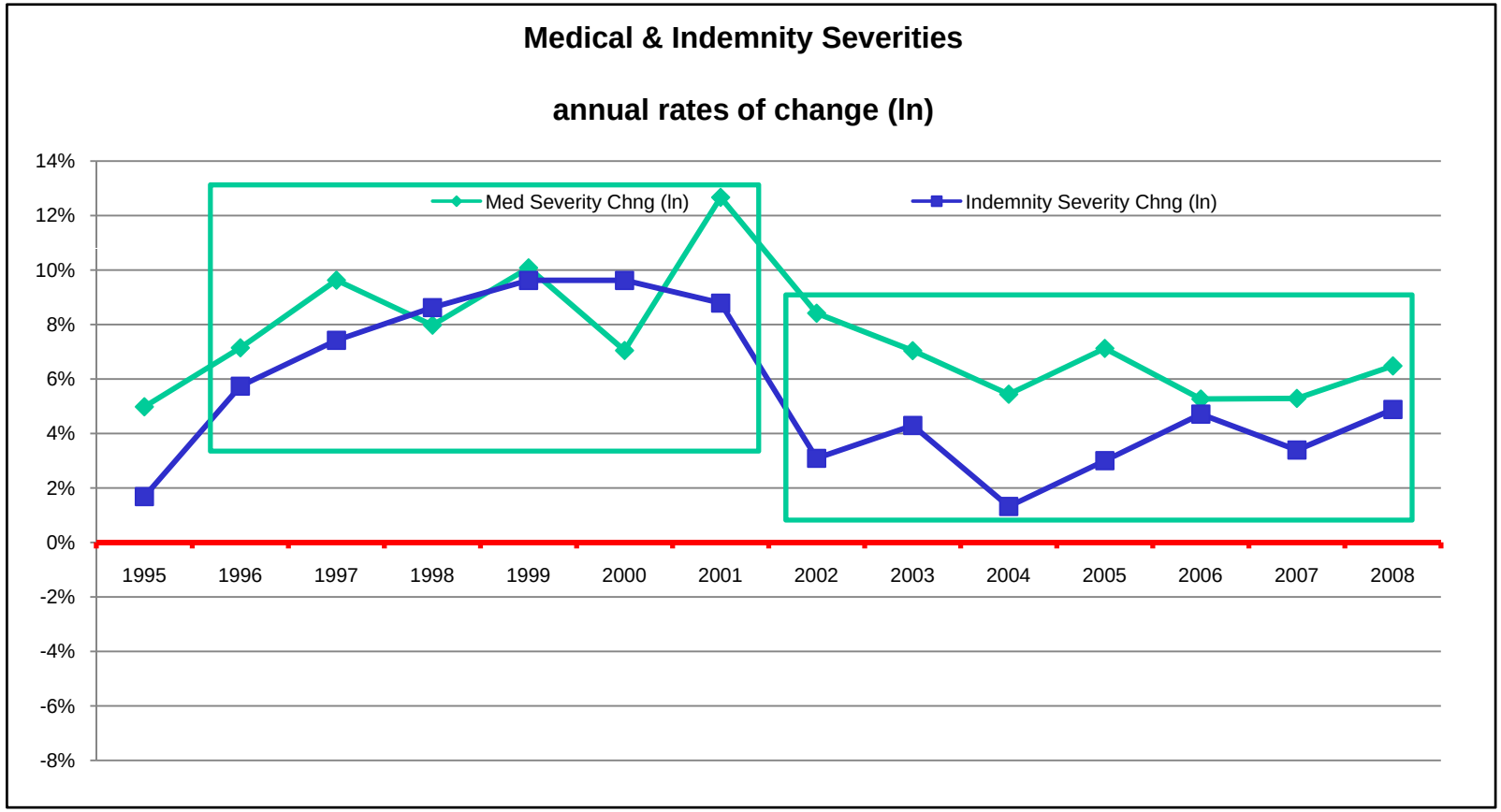
Based on the states where NCCI provides ratemaking services, including state funds

Excludes high deductible policies

WC Indemnity Severity Growth
Changes Closely Followed Medical Severity

	Medical Severity	Indemnity Severity
Annual Change 1991–1993:	1.9%	-1.7%
Annual Change 1994–2001:	8.9%	7.3%
Annual Change 2002–2007:	6.6%	3.4%

WC Loss Cost Trends
Rates of Change in Medical and Indemnity Severity Also Followed a Similar Pattern



Severities - The Pattern:

1995 - 1999: Strong Growth

2000 – 2001: Easing Growth

2002 – 2006: Moderate Growth

Workers Compensation

Severity Drivers

A “Model” of Claims Costs

Cost = Price x Utilization

A “Model” of Claims Costs

Price

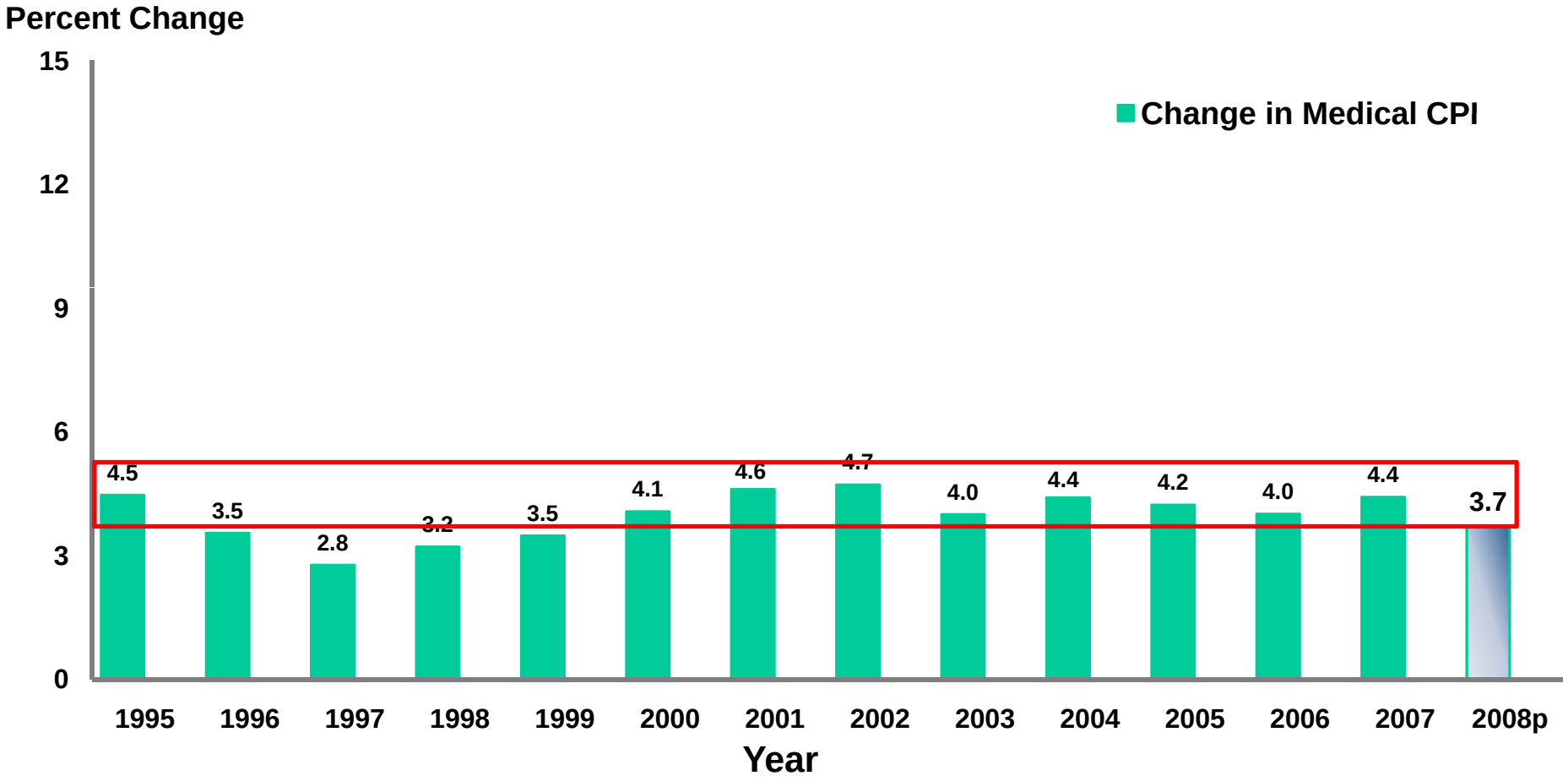
Medical => Medical Consumer Price Index (MCPI)

Indemnity => Average Weekly Wage (AWW)

Different Patterns of Change in Two Measures of Price Inflation:

Medical CPI and Average Weekly Wage

Medical CPI Inflation
Relatively Stable since mid 1990s



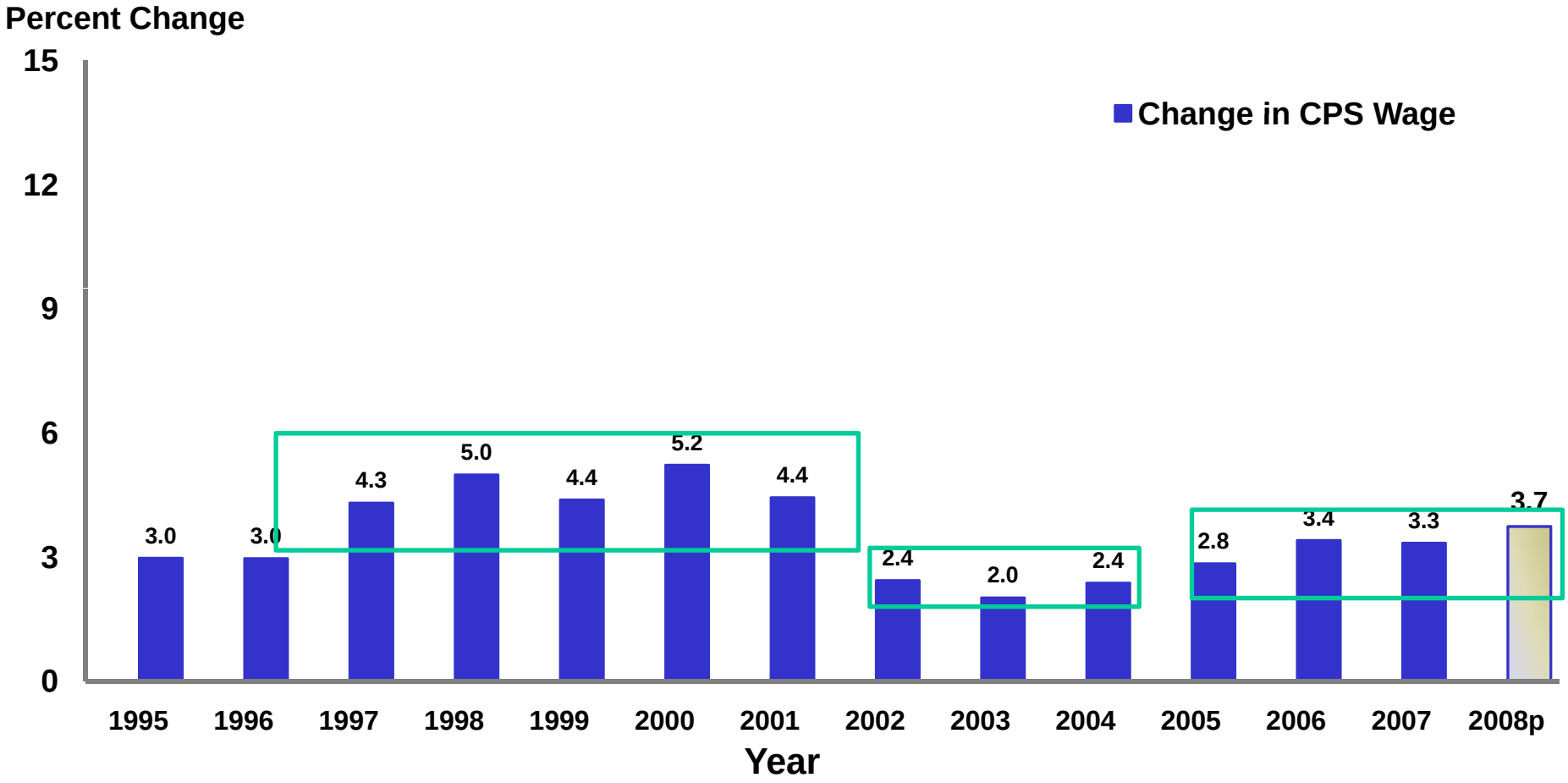
Indemnity severity 2008p: Preliminary based on data valued as of 12/31/2008

Indemnity severity 1995–2007: 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

Source: CPS Wage—All states (Current Population Survey), Economy.com;
Accident year indemnity severity—NCCI states, NCCI

Wage Inflation Tracks the Business Cycle
Strong in Expansions, Eases in Recessions



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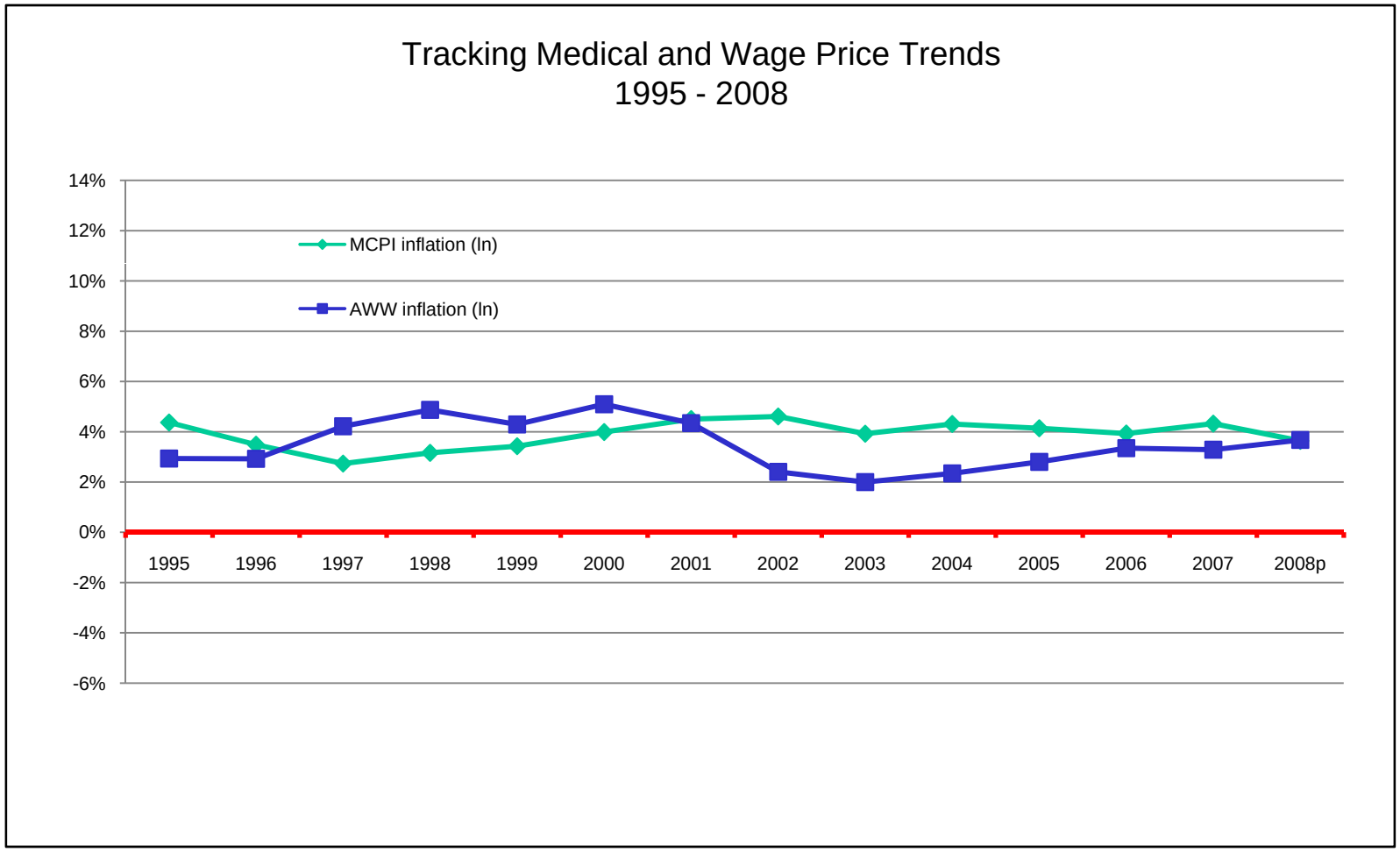
Based on the states where NCCI provides ratemaking services, including state funds; excludes high deductible policies

Source: CPS Wage—All states (Current Population Survey), Economy.com;
Accident year indemnity severity—NCCI states, NCCI

Changing Prices Likely Are Only A Modest Factor in Severity Growth



Price Inflation and Severity Changes

Medical and Indemnity

A “Model” of Claims Costs

Cost = Price x Utilization

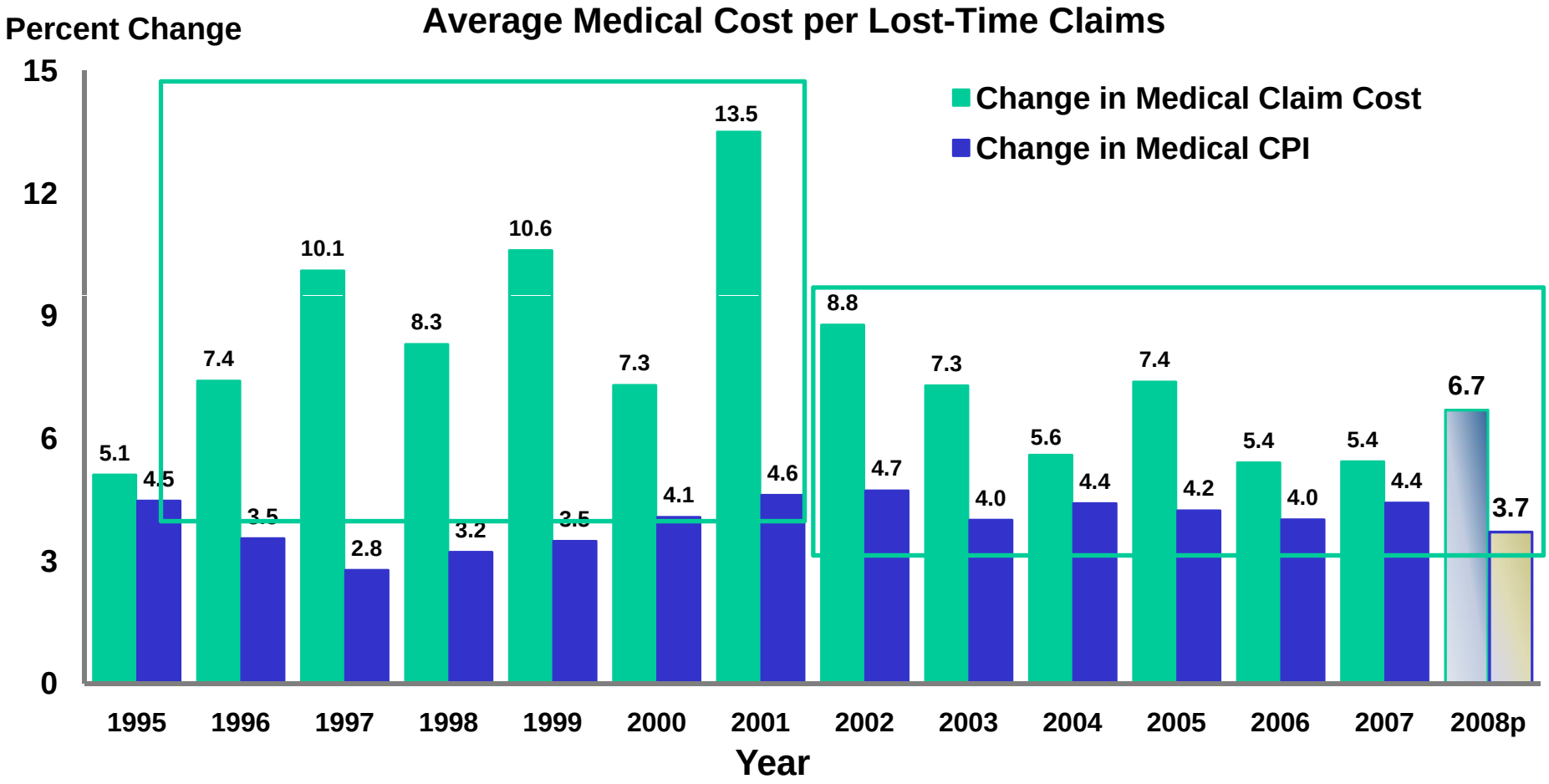
A “Model” of Claims Costs

Utilization

The Key Cost Driver in the Late 1990s

Less of a Factor since 2001

WC Medical Severity Significantly Outpaced MCPI Inflation in the Late 1990s => Utilization



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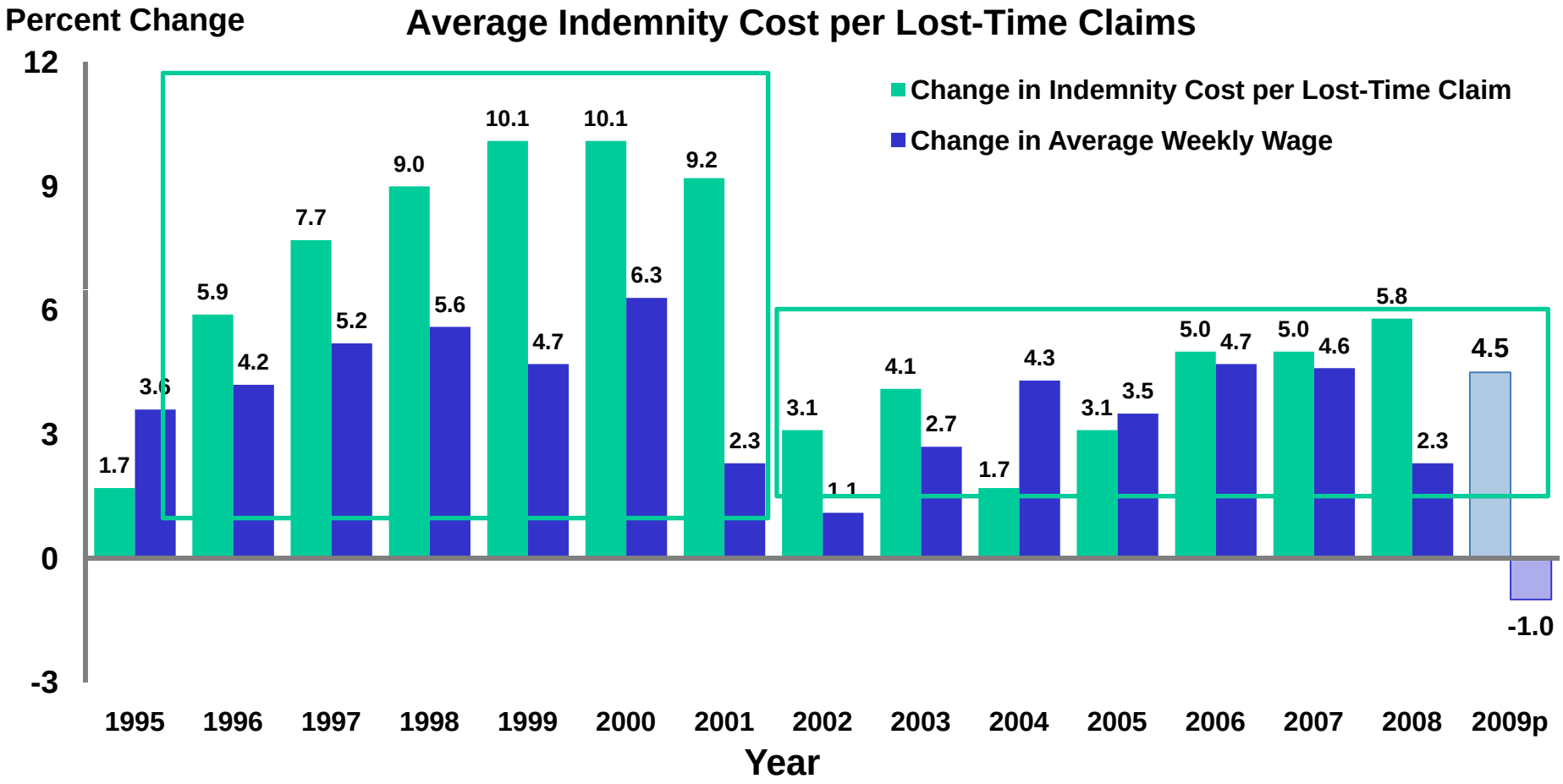
Indemnity severity 1995–2007: Based on data through 12/31/2007, developed to ultimate

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

Source: CPS Wage—All states (Current Population Survey), Economy.com;
Accident year indemnity severity—NCCI states, NCCI

Indemnity Severity Significantly Outpaced Wage Inflation in the Late 1990s => Utilization



Indemnity severity 2009p: Preliminary based on data valued as of 12/31/2009

Indemnity severity 1995–2008: Based on data through 12/31/2008, developed to ultimate

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

Source: Average Weekly Wage 1995-2008: Quarterly Census of Employment and Wages, Economy.com; 2009p, NCCI

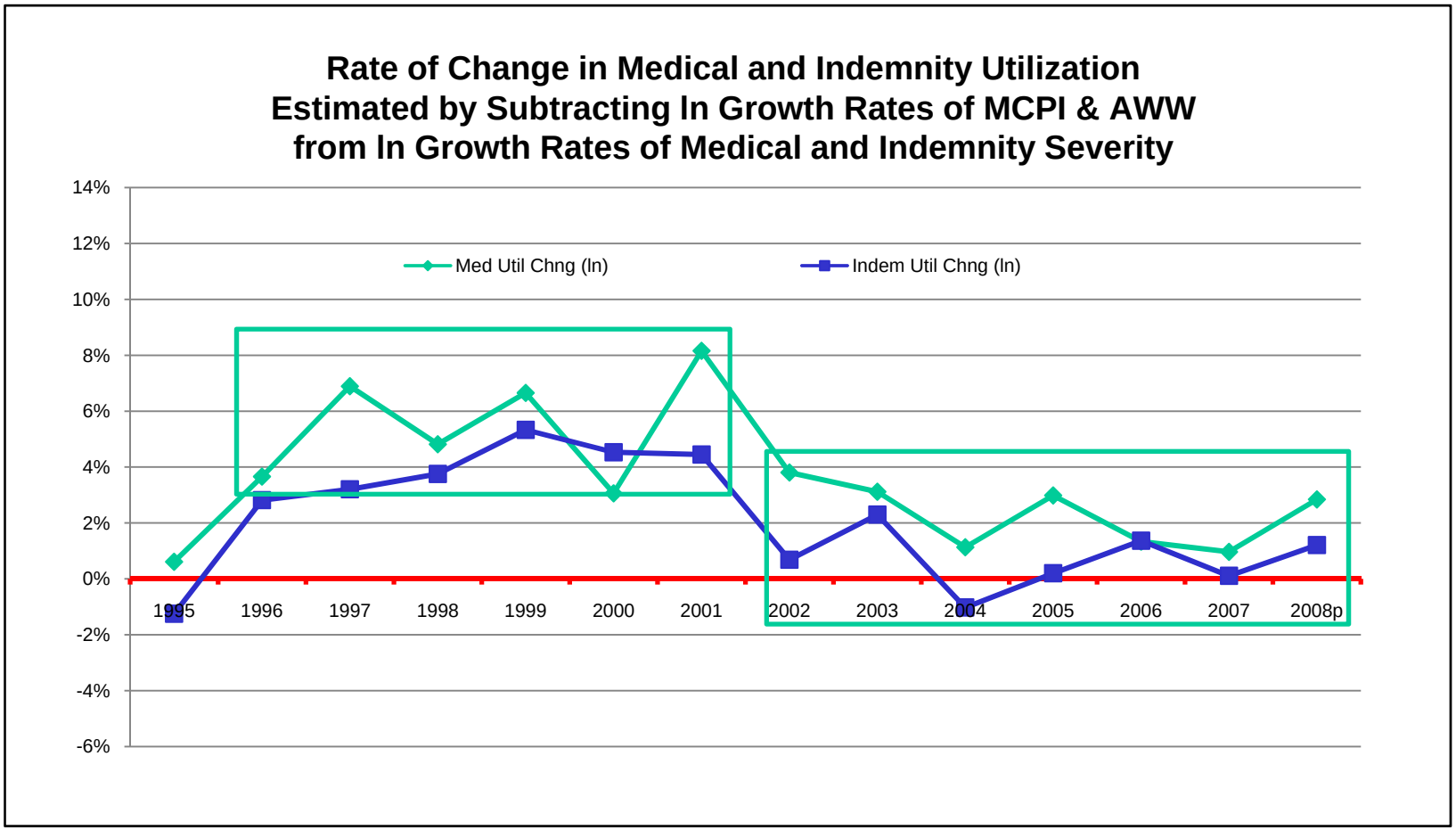
Accident year indemnity severity—NCCI states, NCCI

Tracking Trends in Loss Costs

Removing the Contribution of Price

Medical and Indemnity Utilization Trends

Growth in Utilization Likely the Key Driver of Severity in the Late 1990s



Utilization - The Pattern:

1996 - 2001: Strong Growth

2002 – 2006: Modest to Limited Growth

Medical and Indemnity Utilization

Factors Driving Temporary Medical and Indemnity Severity 1996 - 2001

A “Model” of Claims Costs

Cost = Price x Utilization

A “Model” of Claims Costs

Cost = Price x Utilization

Utilization = Quantity and Mix

Share of Medical and Indemnity Severity Increases (For Claims with Temporary Payments) Due to Mix, Quantity, and Price

Paid Temporary Indemnity Severities & Paid Medical Severities on Temporary Lost-Time Claims Closed Within 24 Months of Date of Injury, NCCI States

	Medical 1996/97-2000/01		Indemnity 1996/97-2000/01	
Total	55%	100%	50%	100%
Share Due to Diagnosis Mix				
Share Due to Number of Treatments or Duration				
Share Due to Price and Other Factors				

A “Model” of Claims Costs

Utilization

The Joint Effect of Mix and Quantity

A “Model” of Claims Costs

Utilization

Change in Mix of Injuries

Changes in the Mix of Diagnoses for Claims with Temporary Payments

Top 10 Claim Diagnoses by Accident Year for Lost-Time Claims with Temporary Payments That Closed Within 24 Months of Date of Injury

	Accident Years 1996/1997 Diagnosis and Severity Index		Accident Years 2000/2001 Diagnosis and Severity Index	
1	Sprain Lumbar Region		Sprain Lumbar Region	
2	Lower Leg Injury, not otherwise specified		Lower Leg Injury, not otherwise specified	
3	Unilateral Inguinal Hernia		Carpal Tunnel Syndrome	
4	Carpal Tunnel Syndrome		Unilateral Inguinal Hernia	
5	Sprain Lumbosacral		Cervicalgia	
6	Lumbar Disc Displacement		Lumbar Disc Displacement	
7	Cervicalgia		Tear Medial Cartilage/Meniscus of Knee	
8	Sprain of Ankle, not otherwise specified		Sprain Rotator Cuff	
9	Lumbago		Sprain of Ankle, not otherwise specified	
10	Sprain of Neck		Lumbosacral Neuritis, not otherwise specified	

The severity index is the ratio of paid indemnity severity for that diagnosis to overall average paid indemnity severity.

Source: NCCI

Share of Medical and Indemnity Severity Increases (For Claims with Temporary Payments) Due to Mix, Quantity, and Price

Paid Temporary Indemnity Severities & Paid Medical Severities on Temporary Lost-Time Claims Closed Within 24 Months of Date of Injury, NCCI States

	Medical 1996/97-2000/01		Indemnity 1996/97-2000/01	
Total	55%	100%	50%	100%
Share Due to Diagnosis Mix	11%	20%	10%	19%
Share Due to Number of Treatments or Duration				
Share Due to Price and Other Factors				

A “Model” of Claims Costs

Utilization = Quantity and Mix

Quantity

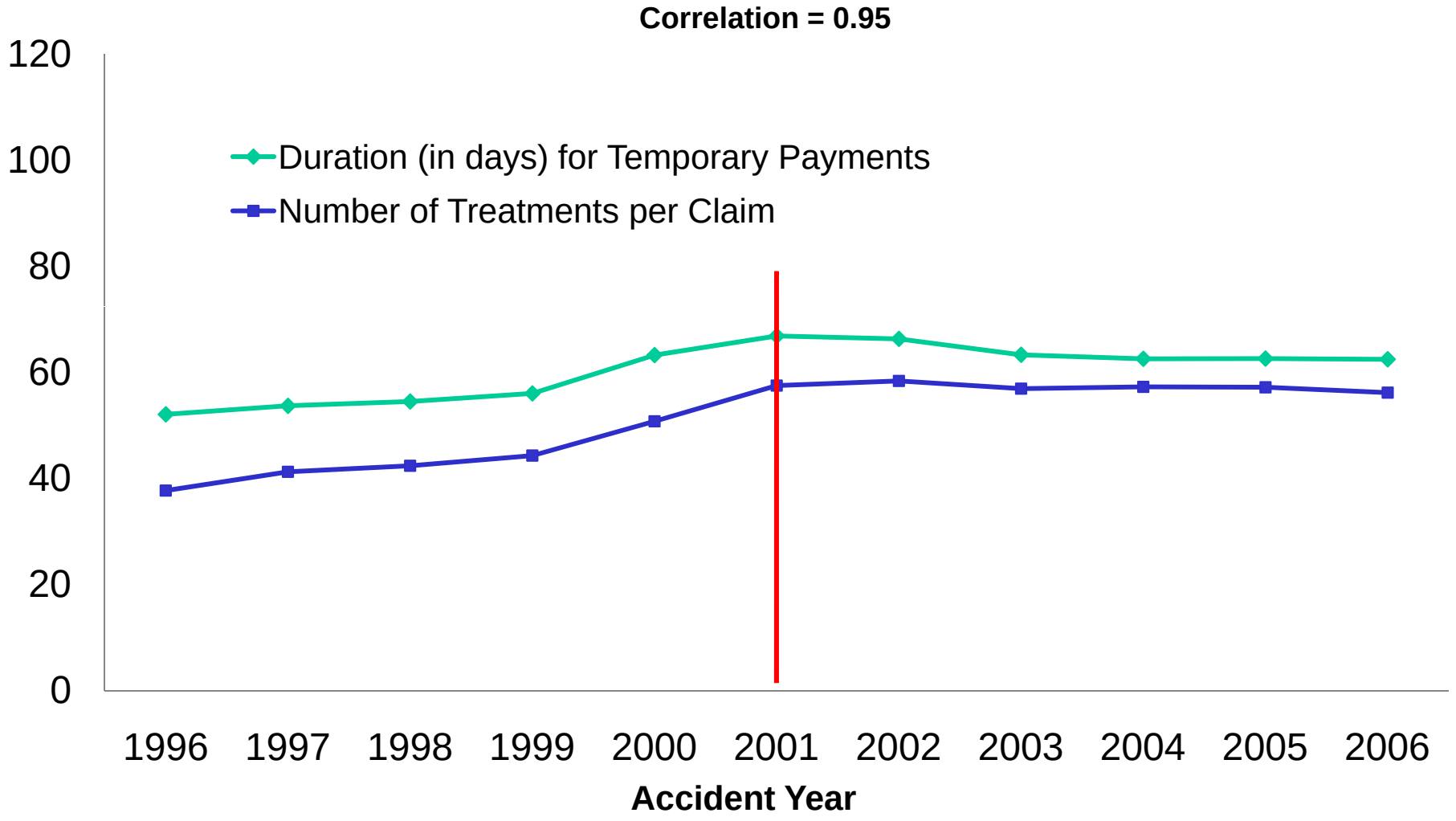
Quantity => Treatments per Claim

Quantity => Duration of Temporary Payments

Comparison of Two Measures of Utilization:

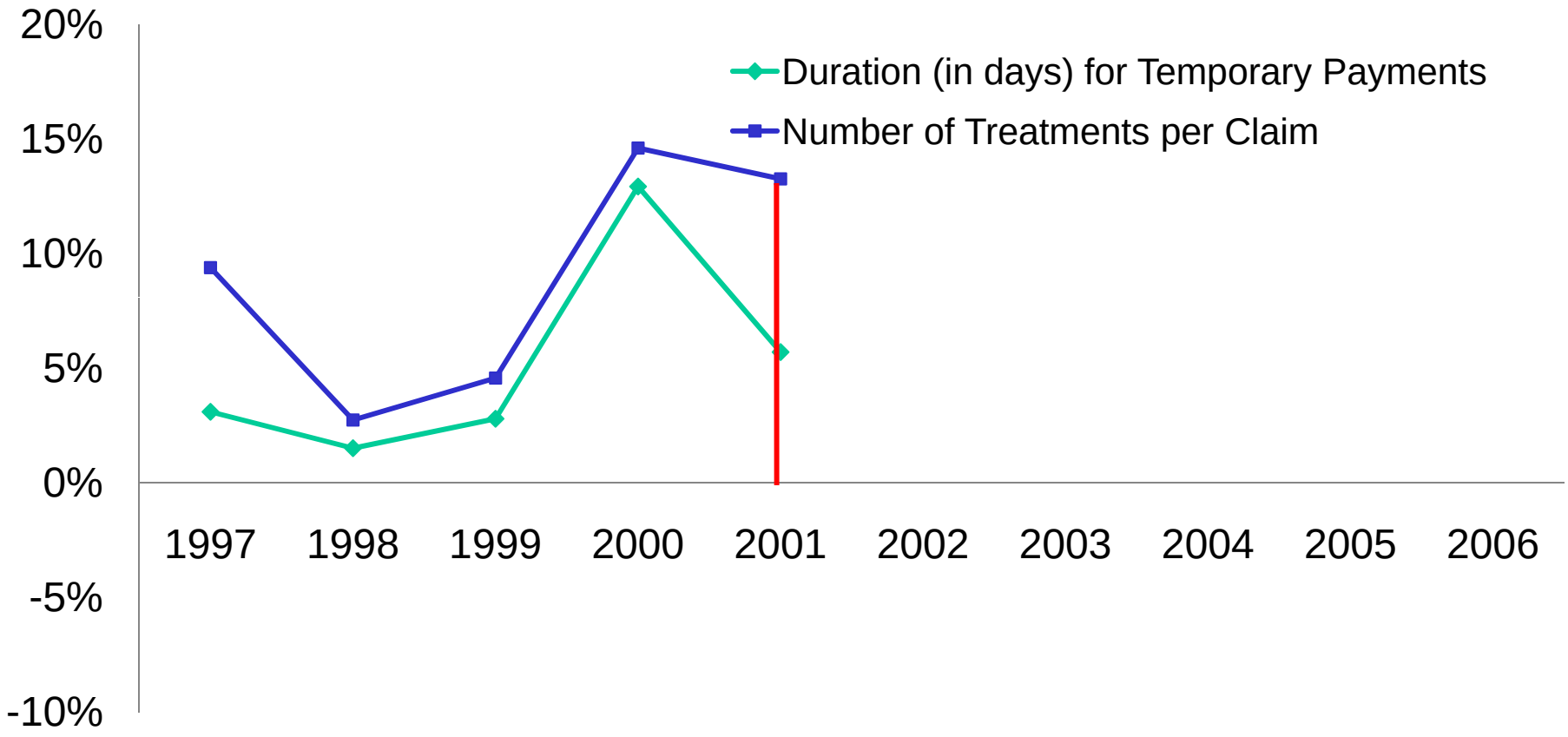
Treatments per Claim and Duration

Duration and Treatments per Claim



Change in Duration and Treatments per Claim

Correlation = 0.91



Accident Year

Share of Medical and Indemnity Severity Increases (For Claims with Temporary Payments) Due to Mix, Quantity, and Price

Paid Temporary Indemnity Severities & Paid Medical Severities on Temporary Lost-Time Claims Closed Within 24 Months of Date of Injury, NCCI States

	Medical 1996/97-2000/01		Indemnity 1996/97-2000/01	
Total	55%	100%	50%	100%
Share Due to Diagnosis Mix	11%	20%	10%	19%
Share Due to Number of Treatments or Duration	31%	57%	18%	36%
Share Due to Price and Other Factors	**13%**	23%	**22%**	45%

% Increase in MCPI 1996/97 – 2000/01 = 15%

% Increase in AWW 1996/97 – 2000/01 = 20%

Factors Driving Temporary Medical & Indemnity Severity 2001 - 2006

Share of Medical and Indemnity Severity Increases (For Claims with Temporary Payments) Due to Mix, Quantity, and Price

Paid Temporary Indemnity Severities & Paid Medical Severities on Temporary Lost-Time Claims Closed Within 24 Months of Date of Injury, NCCI States

	Medical 2001/02-2005/06		Indemnity 2001/02-2005/06	
Total	22%	100%	5%	100%
Share Due to Diagnosis Mix				
Share Due to Number of Treatments or Duration				
Share Due to Price and Other Factors				

Changes in the Mix of Diagnoses for Claims with Temporary Payments

Top 10 Claim Diagnoses by Accident Year for Lost-Time Claims with Temporary Payments That Closed Within 24 Months of Date of Injury

	Accident Years 2001/2002 Diagnosis and Severity Index		Accident Years 2005/2006 Diagnosis and Severity Index	
1	Sprain Lumbar Region	**0.49**	Lower Leg Injury, not otherwise specified	**0.88**
2	Lower Leg Injury, not otherwise specified	**0.87**	Sprain Lumbar Region	**0.44**
3	Carpal Tunnel Syndrome	**1.33**	Unilateral Inguinal Hernia	**0.72**
4	Unilateral Inguinal Hernia	**0.70**	Cervicalgia	**1.33**
5	Cervicalgia	**1.47**	Sprain Rotator Cuff	**2.11**
6	Lumbar Disc Displacement	**2.11**	Tear Medial Cartilage/Meniscus of Knee	**1.46**
7	Tear Medial Cartilage/Meniscus of Knee	**1.43**	Carpal Tunnel Syndrome	**1.18**
8	Sprain Rotator Cuff	**2.03**	Lumbar Disc Displacement	**1.98**
9	Sprain of Ankle, not otherwise specified	**0.40**	Rotator Cuff Syndrome, not otherwise specified	**1.78**
10	Lumbosacral Neuritis, not otherwise specified	**1.82**	Lumbosacral Neuritis, not otherwise specified	**1.57**

The severity index is the ratio of paid indemnity severity for that diagnosis to overall average paid indemnity severity.

Source: NCCI

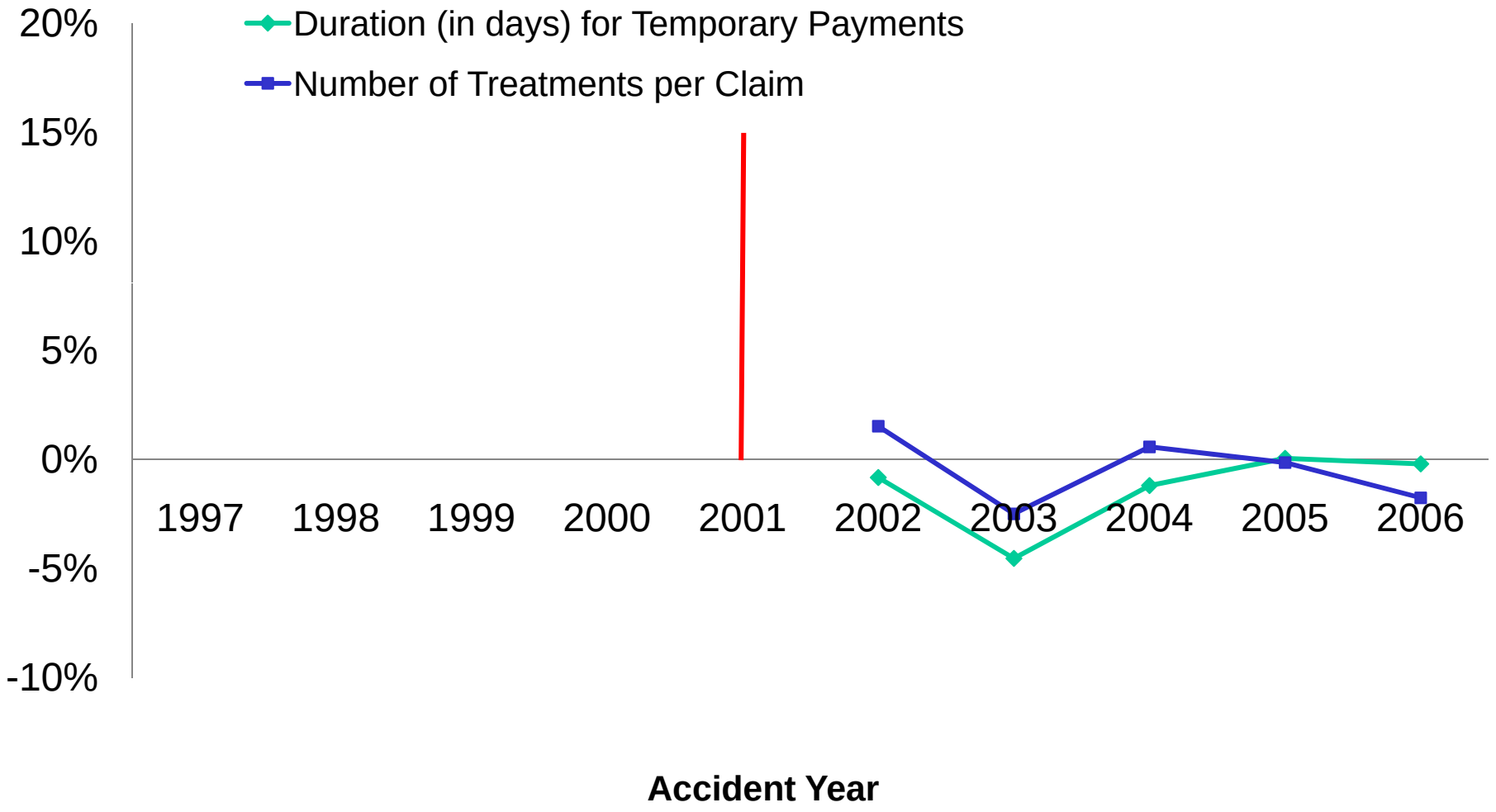
Share of Medical and Indemnity Severity Increases (For Claims with Temporary Payments) Due to Mix, Quantity, and Price

Paid Temporary Indemnity Severities & Paid Medical Severities on Temporary Lost-Time Claims Closed Within 24 Months of Date of Injury, NCCI States

	Medical 2001/02-2005/06		Indemnity 2001/02-2005/06	
Total	22%	100%	5%	100%
Share Due to Diagnosis Mix	4%	20%	3%	52%
Share Due to Number of Treatments or Duration				
Share Due to Price and Other Factors				

Change in Duration and Treatments per Claim

Correlation = 0.91



Share of Medical and Indemnity Severity Increases (For Claims with Temporary Payments) Due to Mix, Quantity, and Price

Paid Temporary Indemnity Severities & Paid Medical Severities on Temporary Lost-Time Claims Closed Within 24 Months of Date of Injury, NCCI States

	Medical 2001/02-2005/06		Indemnity 2001/02-2005/06	
Total	22%	100%	5%	100%
Share Due to Diagnosis Mix	4%	20%	3%	52%
Share Due to Number of Treatments or Duration	-5%	-22%	-9%	-194%
Share Due to Price and Other Factors	**23%**	102%	**12%**	246%

% Increase in MCPI 2001/02 – 2005/06 = 18%

% Increase in AWW 2001/02 – 2005/06 = 11%

Comparison of Two Measures of Utilization:

Treatments per Claim and Duration

Utilization - The Pattern:

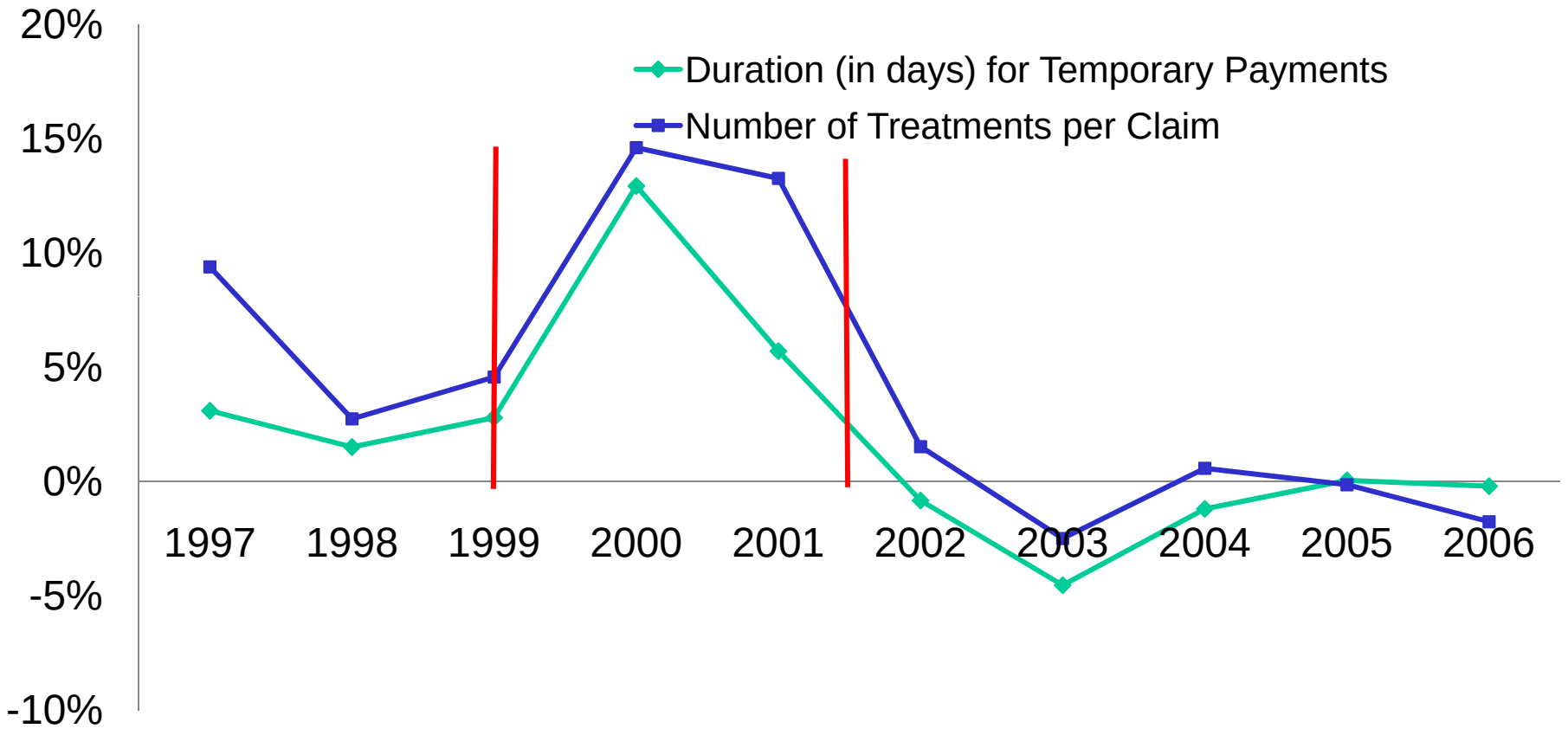
1995 - 1999: Modest Growth

2000 – 2001: Strong Growth

2002 – 2006: No Growth

Change in Duration and Treatments per Claim

Correlation = 0.91



Accident Year

Utilization - The Pattern:

1995 - 1999: Modest Growth

2000 – 2001: Strong Growth

2002 – 2006: No Growth

Is There an Explanation?

What Changed?

Duration – Slower Return to Work:

- **Recession & Recovery**
- **More surgery**

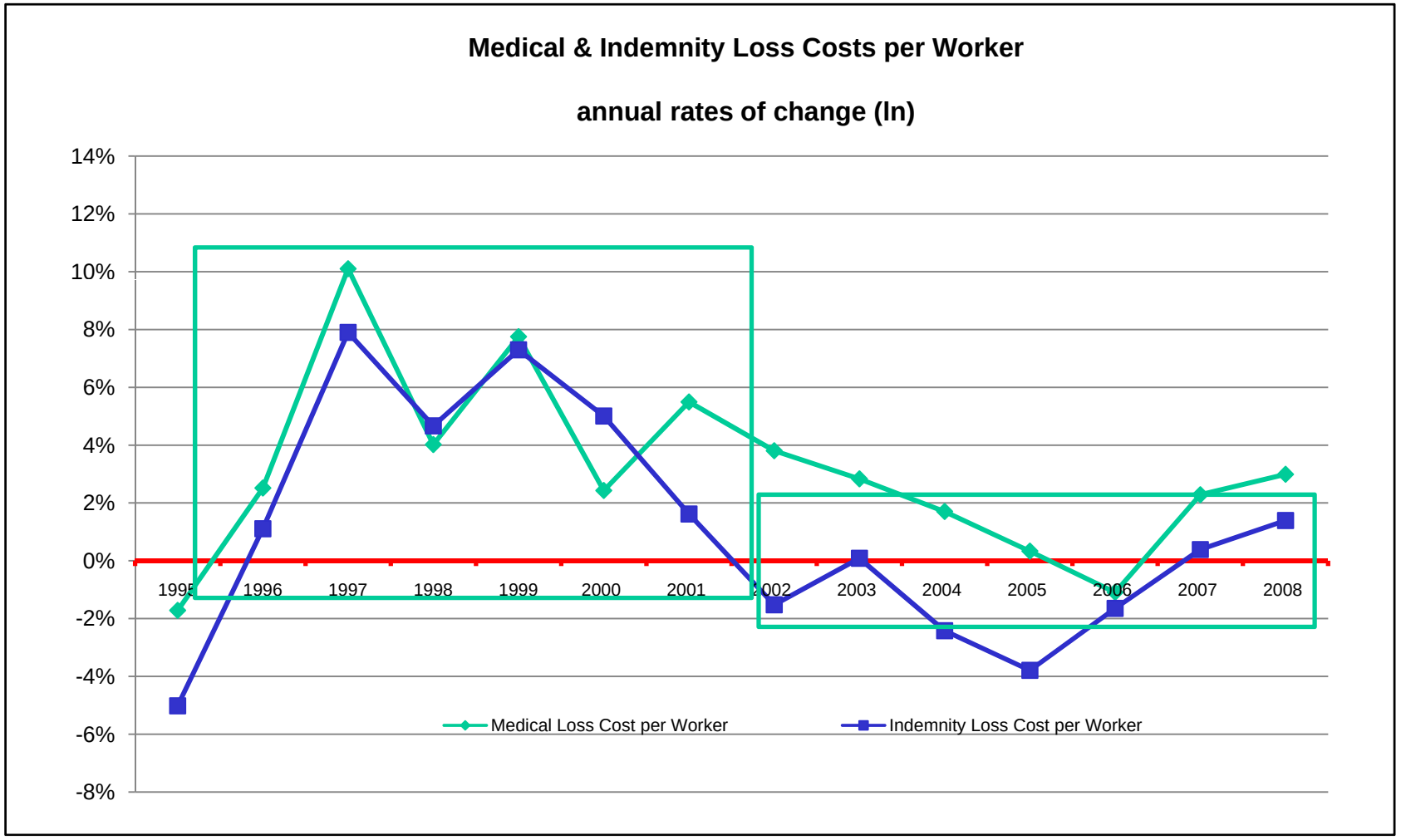
Number of Medical Treatments:

- **Fee schedules**
- **More surgery**
- **Recession & Recovery**

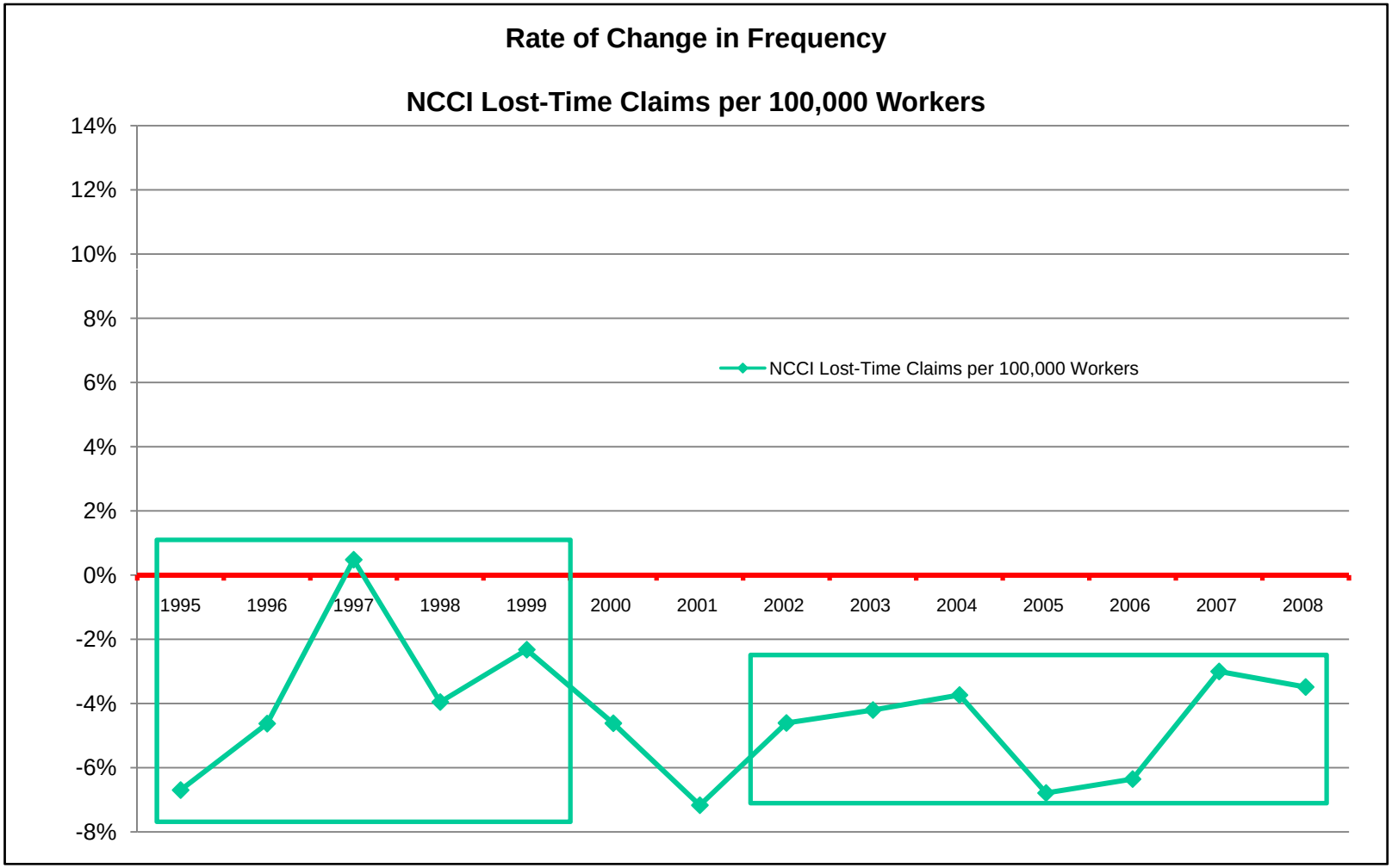
Reviewing the Pieces:

Loss Costs
Frequency
Severity
Price
Utilization

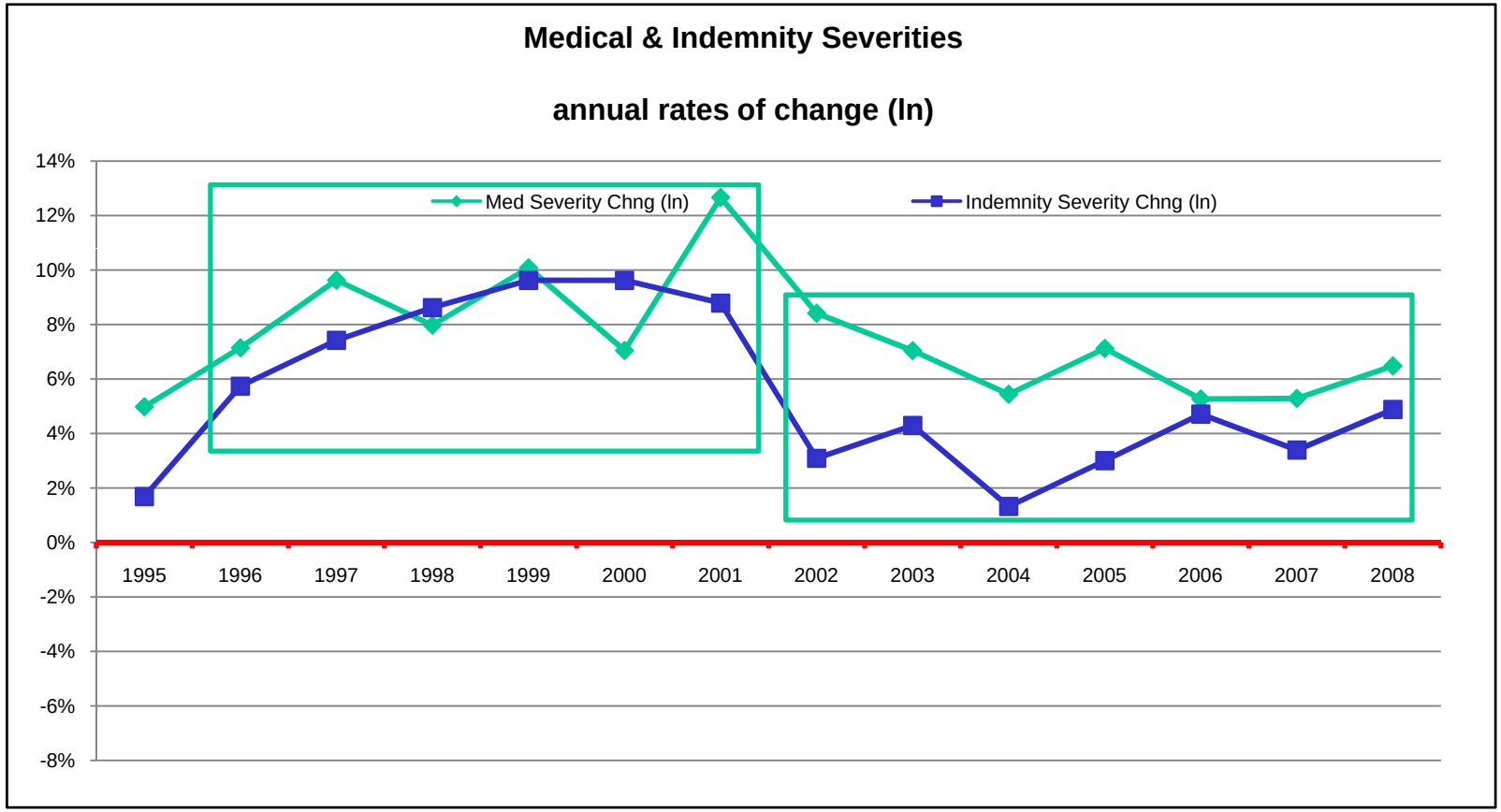
Medical & Indemnity Loss Cost Trends
Rates of Change Seem to Follow a Similar Pattern
Cost per Worker



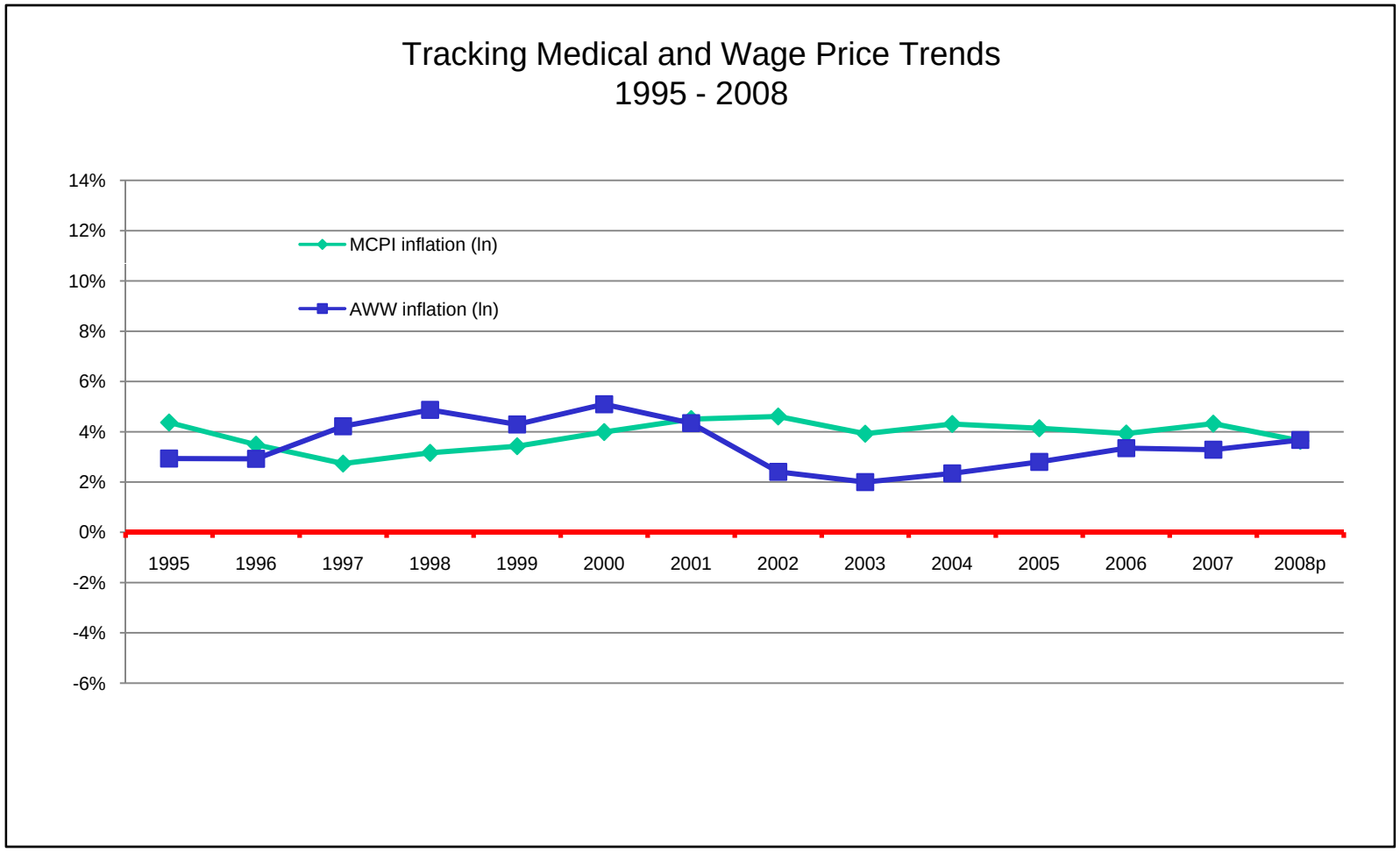
WC Loss Cost Trends
Frequency per # Workers Typically Declined



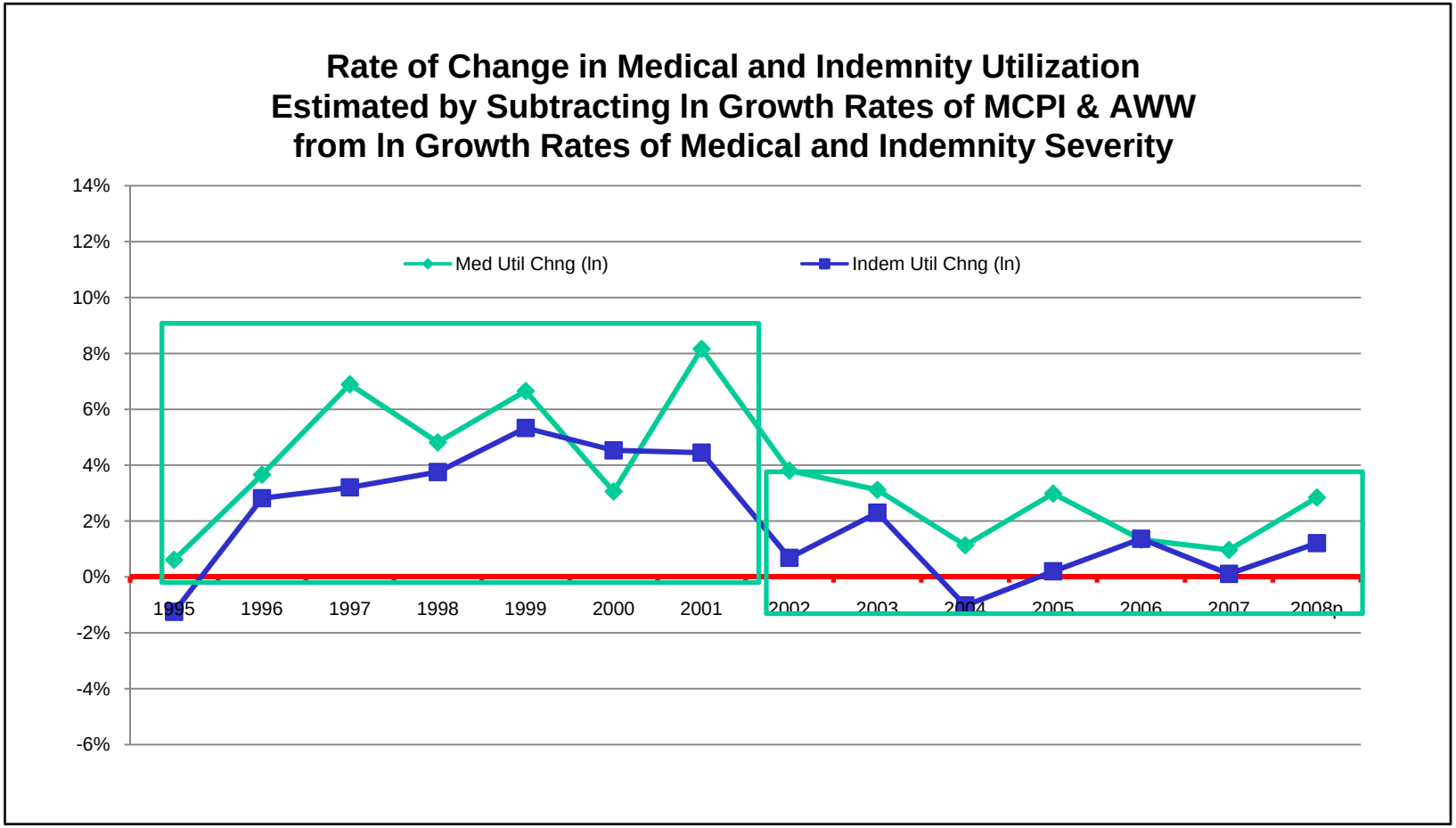
WC Loss Cost Trends
Rates of Change in Medical and Indemnity Severity Also Followed a Similar Pattern



Changing Prices Likely Are Only A Modest Factor in Severity Growth



Growth in Utilization Likely the Key Driver of Severity in the Late 1990s



Questions and More Information

- Seven papers on this subject are available for download in the Research and Outlook Section on **ncci.com**

  - "Measuring the Factors Driving Medical Severity: Price, Utilization, Mix" posted in Spring 2007
  - "Factors Influencing the Growth in Treatments per Claim" posted in September 2008
  - "Significant Changes in Factors Driving Medical Severity 1996-2001 vs. 2001-2006, An Update" posted in July 2010
  - "Workers Compensation Temporary Total Disability Indemnity Benefit Duration 2010 Update" posted in February 2011
  - "The Relationship between Medical Utilization and Indemnity Claim Severity" posted in March 2011
  - "Workplace Injuries and Job Flows" posted in July 2009
  - "An Analysis of Factors Affecting Changes in Manufacturing Incidence Rates" posted in August 2006

  Plus:

  - "State of the Line" presentations from NCCI's Annual Issues Symposium, 2009 & 2010

Thank You

Questions