Workers Compensation and the New Economy: Trends, Challenges and Opportunities

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The Economy Will Impact Workers Compensation Growth and Performance

Workers Comp Is Among the Fastest Growing Major Commercial Lines
US Real GDP Growth*

Real GDP Growth (%)

The Q4:2008 decline was the steepest since the Q1:1982 drop of 6.8%

Recession began in Dec, 2007

Q1 2014/15 GDP data were hit hard by this year’s “Polar Vortex” and harsh winter

Demand for Insurance Should Increase in 2016 as GDP Growth Continues at a Steady, Albeit Moderate Pace and Gradually Benefits the Economy Broadly

* Estimates/Forecasts from Blue Chip Economic Indicators.
Source: US Department of Commerce, Blue Economic Indicators 5/16; Insurance Information Institute.

South Dakota was the economic growth juggernaut of the US in Q3 2015—by far

Only 9 states experienced growth in excess of 3%, which is what we would see nationally in a more typical recovery

Growth Benchmarks: Real GDP
US: 1.9%

Sources: U.S. Bureau of Economic Analysis; Insurance Information Institute.
Real GDP by State Percent Change, 2015:II-2015:III - Lowest 25 States

Growth rates in 10 states were below 1%

Arkansas, West Virginia and North Dakota were the only states to shrink

Sources: US Bureau of Economic Analysis; Insurance Information Institute.
Percent Change in Real GDP by State, 2015:Q3

Sources: US Bureau of Economic Analysis; Insurance Information Institute.
Growth in the West is finally beginning to pick up.

The economic outlook for most of the US is generally positive, though oil and coal states are hurting.

Significant Exposure Implications for All Commercial Lines as Business Bankruptcies Begin to Decline

Labor Markets Trends: 

Recovery Continues in 2016

2015

Largest Job Gains in Many Years

Unemployment Rate Fell to Lowest Level Since 2008

Payrolls Expanded to Record High
Unemployment and Underemployment Rates: Still Falling

January 2000 through March 2016, Seasonally Adjusted (%)

"Headline" Unemployment Rate U-3
Unemployment + Underemployment Rate U-6

For U-6, 8% to 10% is “normal.”

U-6 went from 8.0% in March 2007 to 17.5% in October 2009

U-6 was 9.8% in March 2016.

"Headline” unemployment was 5.0% in March 2016. 4% to 6% is “normal.”

High unemployment and underemployment constrained overall economic growth for years, but the job market is clearly improving.

US Unemployment Rate Forecast

2007:Q1 to 2017:Q4F*

Rising unemployment eroded payrolls and WC’s exposure base.
Unemployment peaked at 10% in late 2009.

Jobless figures have been revised downwards for 2016

Unemployment forecasts have been revised modestly downwards. Optimistic scenarios put the unemployment as low as 4.4% by Q4 of 2016.

Sources: US Bureau of Labor Statistics; Blue Chip Economic Indicators (4/16 edition); Insurance Information Institute.
In March, 21 states had over-the-month unemployment rate decreases, 15 states had increases, and 14 states and the District of Columbia had no change.

Residual impacts of the housing collapse, weak economies are holding back several states.
Unemployment Rates by State, March 2016: Lowest 25 States*

In March, 21 states had over-the-month unemployment rate decreases, 15 states had increases, and 14 states and the District of Columbia had no change.

Strength in Energy, Agricultural States—most also avoided housing bust

*Provisional figures for March 2016, seasonally adjusted.
Nonfarm Payroll (Wages and Salaries): Quarterly, 2005–2016:Q1

Note: Recession indicated by gray shaded column. Data are seasonally adjusted annual rates.

Sources: http://research.stlouisfed.org/fred2/series/WASCUR; National Bureau of Economic Research (recession dates); Insurance Information Institute.

Latest (2016:Q1) was $8.03 trillion, a new peak--$1.80 trillion (29%) above 2009 trough

Prior Peak was 2008:Q3 at $6.54 trillion

Recent trough (2009:Q1) was $6.23 trillion, down 5.3% from prior peak

Growth rates
- 2011:Q1 over 2010:Q1: 5.5%
- 2012:Q1 over 2011:Q1: 4.2%
- 2013:Q1 over 2012:Q1: 2.5%
- 2014:Q1 over 2013:Q1: 4.3%
- 2015:Q1 over 2014:Q1: 4.5%
- 2016:Q1 over 2015:Q1: 4.5%

Prior Peak was 2008:Q3 at $6.54 trillion

Recent trough (2009:Q1) was $6.23 trillion, down 5.3% from prior peak
Payroll vs. Workers Comp Net Written Premiums, 1990-2015E

Payroll Base*

$Billions

Wage & Salary Disbursements
WC NPW

WC premium volume dropped two years before the recession began

WC net premiums written were down $14B or 29.3% to $33.8B in 2010 after peaking at $47.8B in 2005

Continued Payroll Growth and Rate Gains Suggest WC NWP Will Grow Again in 2016

*Private employment; Shaded areas indicate recessions. WC premiums are from NCCI through 2014; I.I.I. estimate for 2015.
Sources: NBER (recessions); Federal Reserve Bank of St. Louis at http://research.stlouisfed.org/fred2/series/WASCUR (annualized as of Q4 2015); NCCI; I.I.I.
Key Sectors Critical to the Economy and the P/C Insurance Industry
Private Construction Activity Is Moving in a Positive Direction though Remains Well Below Pre-Crisis Peak; Residential Dominates

*2016 figure is a seasonally adjusted annual rate as of February.

Sources: US Department of Commerce [http://www.census.gov/construction/c30/c30index.html](http://www.census.gov/construction/c30/c30index.html); Insurance Information Institute.
Overall Construction Activity is Up Again After Languishing in Early 2015; State/Local Sector Government Sector May Be Recovering as Budget Woes Ease in Some Jurisdictions

*seasonally adjusted data through February 2016.
Source: U.S. Census Bureau, [http://www.census.gov/construction/c30/c30index.html](http://www.census.gov/construction/c30/c30index.html) ; Insurance Information Institute.
New Private Housing Starts, 1990-2021F

Insurers are continuing to see meaningful exposure growth in the wake of the "Great Recession" associated with home construction: Construction Risk Exposure, Surety, Commercial Auto; Potent driver of Workers' Comp Exposure.

Source: U.S. Department of Commerce; Blue Chip Economic Indicators (4/16 for 2016-17; 3/16 for 2018-21F; Insurance Information Institute.)
Government Construction Spending Peaked in 2009, Helped by Stimulus Spending, but Contracted As State/Local Governments Grappled with Deficits and Federal Sequestration; Only Now Recovering

*2016 figure is a seasonally adjusted annual rate as of February; [http://www.census.gov/construction/c30/historical_data.html](http://www.census.gov/construction/c30/historical_data.html)

Sources: US Department of Commerce; Insurance Information Institute.
Construction employment is +1.237 million above Jan. 2011 (+22.8%) trough

Construction and manufacturing employment constitute 1/3 of all WC payroll exposure.

*Seasonally adjusted.
The Construction Sector Was a Growth Leader in 2014-16 as the Housing Market, Private Investment and Govt. Spending Recover. WC Insurers Continue to Benefit.

Note: Recession indicated by gray shaded column.

The U.S. Manufacturing and Energy Sectors Are Being Buffeted by a High Dollar, Weak Export Markets and Plunging Oil Prices
ISM Manufacturing Index
(Values > 50 Indicate Expansion)

January 2010 through April 2016

The manufacturing sector expanded for 70 of the 76 months from Jan. 2010 through Apr. 2016. Manufacturing sector has weakened recently due to weakness abroad, strong dollar and collapse in oil prices.

Weakness abroad, falling energy prices and a strong dollar are hurting the manufacturing sector, especially exports. Manufacturing growth leads to gains in many commercial exposures: WC, Commercial Auto, Marine, Property, and various Liability Coverages.

* Seasonally adjusted; Data published Apr. 4, 2016.
Manufacturing Growth for Selected Sectors, 2016 vs. 2015*

Manufacturing Is Contracting Across a Number of Sectors, Especially Petroleum and Coal. Adverse Exposure Impacts Are Likely for: WC, Commercial Property, Commercial Auto and Certain Liability Coverages

*Seasonally adjusted; Date are YTD comparing data through February 2016 to the same period in 2015.
Manufacturing employment has been a surprising source of strength in the economy. Global economic weakness, falling oil prices have hurt.

*Seasonally adjusted.
Employment in Oil & Gas Extraction, Jan. 2010—March 2016*


Oil and gas extraction employment is down 11.2% since Oct. 2014 as oil prices sink

*Seasonally adjusted
POSITIVE LABOR MARKET DEVELOPMENTS

Key Factors Driving Workers Compensation Exposure
Average Weekly Hours of All Private Workers, March 2006—March 2016

(Hours Worked)

*Seasonally adjusted
Note: Recessions indicated by gray shaded columns.
The average hourly wage was $26.43 in March 2016, up 19.8% from $21.22 when the recession began in Dec. 2007.

Wage gains continued during the recession, despite massive job losses.

*Seasonally adjusted
Note: Recessions indicated by gray shaded columns.
ADVERSE LONG-TERM LABOR MARKET DEVELOPMENTS

Key Factors Harming Workers Compensation Exposure and the Overall Economy
Large numbers of people are exiting (or not returning to the labor force)

Labor force participation remains far below pre-recession levels but has improved modestly in recent months

*Defined as the percentage of working age persons in the population who are employed or actively seeking work.

Note: Recessions indicated by gray shaded columns.

In recent good times, the number of discouraged workers ranged from 200,000-400,000 (1995-2000) or from 300,000-500,000 (2002-2007).

Notes: Recessions indicated by gray shaded columns. Data are seasonally adjusted.
P/C Insurance Industry
Financial Overview

2015: Second-Best Year in the Post-Crisis Era & Carbon Copy of 2014

Modest CATs, Reserve Releases

Workers Comp Helped Too

- 2005 ROE* = 9.6%
- 2006 ROE = 12.7%
- 2007 ROE = 10.9%
- 2008 ROE = 0.1%
- 2009 ROE = 5.0%
- 2010 ROE = 6.6%
- 2011 ROAS¹ = 3.5%
- 2012 ROAS¹ = 5.9%
- 2013 ROAS¹ = 10.2%
- 2014 ROAS¹ = 8.4%
- 2015 ROAS = 8.4%

- ROE figures are GAAP; ¹Return on avg. surplus. Excluding Mortgage & Financial Guaranty insurers yields a 8.2% ROAS in 2014, 9.8% ROAS in 2013, 6.2% ROAS in 2012, 4.7% ROAS for 2011, 7.6% for 2010 and 7.4% for 2009; 2015E is annualized figure based actual figure through Q3 of $44.0

Sources: A.M. Best, ISO; Insurance Information Institute
Profitability Peaks & Troughs in the P/C Insurance Industry, 1975 – 2015

*Profitability = P/C insurer ROEs. 2011-15 figures are estimates based on ROAS data. Note: Data for 2008-2014 exclude mortgage and financial guaranty insurers.
Source: Insurance Information Institute; NAIC, ISO, A.M. Best, Conning
P/C Profitability Is Both by Cyclicality and Ordinary Volatility

Hugo
Andrew
Northridge
Lowest CAT Losses in 15 Years
Sept. 11
Katrina, Rita, Wilma
4 Hurricanes
Financial Crisis*
Record Tornado Losses
Low CATs
Modestly higher CATs

Sources: ISO, Fortune; Insurance Information Institute.
As Recently as 2001, Insurers Paid Out Nearly $1.16 for Every $1 in Earned Premiums

Heavy Use of Reinsurance Lowered Net Losses

Relatively Low CAT Losses, Reserve Releases

Relatively Low CAT Losses, Reserve Releases

Avg. CAT Losses, More Reserve Releases

Higher CAT Losses, Shrinking Reserve Releases, Toll of Soft Market

Best Combined Ratio Since 1949 (87.6)

Cyclical Deterioration

Sandy Impacts

Lower CAT Losses

3 Consecutive Years of U/W Profits: First Time Since 1971-73


Sources: A.M. Best, ISO (2014-2015); Figure for 2010-2013 is from A.M. Best P&C Review and Preview, Feb. 16, 2016.
Cumulative underwriting deficit from 1975 through 2013 was $493B

Underwriting profit in 2015 totaled $8.7B

High cat, WC losses in 2011 led to the largest underwriting loss since 2002

Large Underwriting Losses Are NOT Sustainable in Current Investment Environment

* Includes mortgage and financial guaranty insurers in all years.
Sources: A.M. Best, ISO; Insurance Information Institute.
Number of Years with Underwriting Profits by Decade, 1920s–2010s

Underwriting Profits Were Common Before the 1980s (40 of the 60 Years Before 1980 Had Combined Ratios Below 100) – But Then They Vanished. Not a Single Underwriting Profit Was Recorded in the 25 Years from 1979 Through 2003

* 2009 combined ratio excl. mort. and finl. guaranty insurers was 99.3, which would bring the 2000s total to 4 years with an u/w profit.

**Data for the 2010s is for the period 2010 through 2015.

Note: Data for 1920–1934 based on stock companies only.

Sources: Insurance Information Institute research from A.M. Best Data.
Reserve releases are expected to gradually taper off slowly, but will continue to benefit the bottom line and combined ratio through at least 2017.
Policyholder Surplus, 2006:Q4–2015:Q4

($ Billions)

2007:Q3 Pre-Crisis Peak

Drop due to near-record 2011 CAT losses

Surplus as of 12/31/15 stood at a near-record high $673.7B

The industry now has $1 of surplus for every $0.76 of NPW, close to the strongest claims-paying status in its history.

2010:Q1 data includes $22.5B of paid-in capital from a holding company parent for one insurer’s investment in a non-insurance business.

The P/C insurance industry entered 2016 in very strong financial condition.

Sources: ISO, A.M. Best.
THE CHALLENGES OF GROWTH

Cycles, M&A and Lingering Scars of the ‘Great Recession’

Shaded areas denote “hard market” periods
Note: Data through 1934 are based on stock companies only. Data include state funds beginning in 1998.
Source: A.M. Best; Insurance Information Institute.
44 states showed commercial lines growth from 2007 through 2015.

Growth Benchmarks: Commercial
US: 9.0%

Sources: NAIC via SNL Financial; Insurance Information Institute.
Direct Premiums Written: Comm. Lines
Percent Change by State, 2007-2015

Bottom 25 States

Eight states still write less commercial business than they did in 2007

Sources: NAIC via SNL Financial; Insurance Information Institute.
Direct Premiums Written: Workers’ Comp Percent Change by State, 2007-2015*

Top 25 States

27 states showed positive growth in the workers comp line from 2007 – 2015 (up from 13 through 2013 and 5 through 2012).

*Excludes monopolistic fund states: ND, OH, WA, WY as well as WV, which transitioned to a competitive structure during this period.

Sources: NAIC data, sourced from S&P Global Market Intelligence; Insurance Information Institute.
Direct Premiums Written: Worker’s Comp
Percent Change by State, 2007-2015*

Bottom 25 States

States with the poorest performing economies also produced some of the most negative net change in premiums of the past 8 years

*Excludes monopolistic fund states: ND, OH, WA, WY as well as WV, which transitioned to a competitive structure during this period.
Sources: NAIC data, sourced from S&P Global Market Intelligence; Insurance Information Institute.
U.S. INSURANCE MERGERS AND ACQUISITIONS, P/C SECTOR, 1994-2015E (1)

M&A activity in 2015 will likely reach its highest level since 1998

M&A activity in the P/C sector was up sharply in 2015

Transaction values

Number of transactions

(1) Includes transactions where a U.S. company was the acquirer and/or the target.

M&A Activity Is Shifting Toward North America and Asia and Away from Europe

Asian, N. American deal volumes were up sharply in 2015

M&A: Deal Rationale by Dollar Amount

Scale drives most deals (excluding health sector)

INVESTMENTS: THE NEW REALITY

Investment Performance is a Key Driver of Profitability

Depressed Yields Will Necessarily Influence Underwriting & Pricing
Due to persistently low interest rates, investment income fell in 2012, 2013 and 2014 but showed a small (1.9%) increase in 2015—a trend that may continue.

Investment gains consist primarily of interest and stock dividends. Sources: ISO; Insurance Information Institute.

Yields on 10-Year U.S. Treasury Notes have been essentially below 5% for more than a decade.

Despite the Fed’s December 2015 rate hike, yield remain low though short-term yields have seen some gains

Since roughly 80% of P/C bond/cash investments are in 10-year or shorter durations, most P/C insurer portfolios will have low-yielding bonds for years to come.

*Monthly, constant maturity, nominal rates, through March 2016.
Total Invested Assets = $1.533 Trillion

The yield on invested assets remains low relative to pre-crisis yields. The Fed’s plan to raise interest rates in late 2015 has pushed up some yields, albeit quite modestly.

Sources: A.M. Best; 2015E-2016P figures from A.M. Best P/C Review and Preview, Feb. 2016; Insurance Information Institute
A full normalization of interest rates is unlikely until 2019, more than a decade after the onset of the financial crisis.

Sources: Blue Chip Economic Indicators (4/16 for 2016 and 2017; for 2018-2021 3/16 issue); Insurance Info. Institute.
Treasury yield curve remains near its most depressed level in at least 45 years. Investment income is depressed as a result. Fed began to raise rates in Dec. 2015, but yields unlikely to return to pre-crisis levels anytime soon.

The Fed Began to Raise Rates in Dec. 2015 but Market Volatility and Weakness Abroad Have Made Additional Hikes Difficult

*As of April 22, 2016.
Source: Federal Reserve Board of Governors; http://www.federalreserve.gov/releases/h15/data.htm; Insurance Information Institute.
Annual Inflation Rates, (CPI-U, %), 1990–2017F

Inflation peaked at 5.6% in August 2008 on high energy and commodity crisis. The recession and the collapse of the commodity bubble reduced inflationary pressures in 2009/10.

Inflationary expectations have slipped (due in part to falling energy costs) allowing the Fed to maintain low interest rates.

Slack in the U.S. economy and falling energy prices suggests that inflationary pressures should remain subdued for an extended period of times.

Sources: US Bureau of Labor Statistics; Blue Chip Economic Indicators, 4/16 (forecasts).
Insurers Posted Net Realized Capital Gains in 2010 - 2015 Following Two Years of Realized Losses During the Financial Crisis. Realized Capital Losses Were a Primary Cause of 2008/2009’s Large Drop in Profits and ROE.

Sources: A.M. Best, ISO; Insurance Information Institute.
Total Investment Gains Were Flat in 2015 as Investment Income Rose Marginally and Realized Capital Gains Fell Slightly

1 Investment gains consist primarily of interest, stock dividends and realized capital gains and losses.

* 2005 figure includes special one-time dividend of $3.2B; 2015 figure is through Q3 2015.

Sources: ISO, SNL; Insurance Information Institute.
Total Investment Gains Were Down Slightly in 2014 as Low Interest Rates Pressured Investment Income but Realized Capital Gains Remained Robust

1 Investment gains consist primarily of interest, stock dividends and realized capital gains and losses.

* 2005 figure includes special one-time dividend of $3.2B; 2015 figure is through Q3 2015.

Sources: ISO, SNL; Insurance Information Institute.
In 2016 the stock market had its worst start ever but has since recovered. Volatility is endemic to stock markets—and may be increasing—but there is no persistent downward trend over long periods of time.

*Through May 1, 2016.

Workers Compensation
Operating Environment

Workers Comp Results Have Improved Substantially in Recent Years

Can Gains Be Maintained?
Workers Compensation Combined Ratio: 1994–2015P

Workers Comp Results Began to Improve in 2012. Underwriting Results Deteriorated Markedly from 2007-2010/11 and Were the Worst They Had Been in a Decade.

Sources: A.M. Best (1994-2009); NCCI (2010-2015P) and are for private carriers only; Insurance Information Institute.
Commercial Lines Combined Ratio, 1990-2015F*

*2007-2012 figures exclude mortgage and financial guaranty segments.
Workers Compensation Premium: Fifth Consecutive Year of Increase

Net Written Premium

<table>
<thead>
<tr>
<th>Calendar Year</th>
<th>State Funds ($ B)</th>
<th>Private Carriers ($ B)</th>
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<td>90</td>
<td>31.0</td>
<td>31.3</td>
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<td>91</td>
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<td>15</td>
<td>35.9</td>
<td>32.9</td>
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</tbody>
</table>

Pvt. Carrier NWP growth was +2.9% in 2015, +4.3% in 2014, +5.1% in 2013 and 8.7% in 2012

p Preliminary

Source: NCCI from Annual Statement Data.
Includes state insurance fund data for the following states: AZ, CA, CO, HI, ID, KY, LA, MD, MO, MT, NM, OK, OR, RI, TX, UT.
Each calendar year total for State Funds includes all funds operating as a state fund that year.
PRIVATE CARRIERS: Overall 2015 Growth = +4.3%

While growth rates varied widely, most states experienced modest positive growth in 2015.

*Excludes monopolistic fund states (in gray): OH, ND, WA and WY.
Source: NCCI.
2014 Workers Compensation Direct Written Premium Growth, by State*

PRIVATE CARRIERS: Overall 2014 Growth = +4.6%

While growth rates varied widely, most states experienced positive growth in 2014.

*Excludes monopolistic fund states (in gray): OH, ND, WA and WY.
Source: NCCI.
# Workers Compensation Components of Written Premium Change, 2014 to 2015

## Written Premium Change from 2014 to 2015

<table>
<thead>
<tr>
<th></th>
<th>Change</th>
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<tbody>
<tr>
<td>Net Written Premium—Countrywide</td>
<td>+2.9%</td>
</tr>
<tr>
<td>Direct Written Premium—Countrywide</td>
<td>+4.3%</td>
</tr>
<tr>
<td>Direct Written Premium—NCCI States</td>
<td>+2.5%</td>
</tr>
</tbody>
</table>

## Components of DWP Change for NCCI States

<table>
<thead>
<tr>
<th>Component</th>
<th>Change</th>
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</thead>
<tbody>
<tr>
<td>Change in Carrier Estimated Payroll</td>
<td>+4.5%</td>
</tr>
<tr>
<td>Change in Bureau Loss Costs and Mix</td>
<td>-4.0%</td>
</tr>
<tr>
<td>Change in Carrier Discounting</td>
<td>-0.3%</td>
</tr>
<tr>
<td>Change in Other Factors</td>
<td>+2.2%</td>
</tr>
<tr>
<td><strong>Combined Effect</strong></td>
<td><strong>+2.5%</strong></td>
</tr>
</tbody>
</table>

Sources:
- **Countrywide**: Annual Statement data.
- **NCCI States**: Annual Statement Statutory Page 14 for all states where NCCI provides ratemaking services.
- **Components**: NCCI Policy data.

Growth is now almost entirely payroll driven.
Workers Comp Approved Changes in Bureau Premium Level, 2000-2016p


Note: Bureau premium level charges reflect approved changes in advisory rates, loss costs, assigned risk rates relative to those approved in NCCI states only IN and NC are filed in cooperation with state rating bureaus.


Source: NCCI
WC Approved or Filed and Pending Change in NCCI Premium Level by State*

Latest Change for Voluntary Market

Many states have seen rates drop recently

WC Approved Changes in Bureau Premium Level (Rates/Loss Costs)

By Effective Date for Total Market

**Cumulative 1990–1993**: +36.3%
**Cumulative 1994–1999**: -27.8%
**Cumulative 2000–2003**: +17.1%
**Cumulative 2004–2011**: -30.8%
**Cumulative 2011–2014**: +11.8%

*Approved rates/loss costs are down for the first time since 2010*

*Note*: Bureau premium level changes are countrywide approved changes in advisory rates, loss costs and assigned risk rates as filed by applicable rating organization, relative to those previously approved.

*Source*: NCCI.

*States approved through 4/24/15.*
Workers Compensation Lost-Time Claim Frequency Declined in 2015

Average Annual Change = −3.6% (1994–2014)

*Adjustments primarily due to significant audit activity.
2015p: Preliminary based on data valued as of 12/31/2015.
Source: NCCI Financial Call data, developed to ultimate and adjusted to current wage and voluntary loss cost level; Excludes high deductible policies; 1994-2014: Based on data through 12/31/14. Data for all states where NCCI provides ratemaking services, excluding WV.
Frequency is the number of lost-time claims per $1M pure premium at current wage and voluntary loss cost level.
### Workers Comp Indemnity Claim Costs: Slight Increase in 2015

#### Average Indemnity Cost per Lost-Time Claim

Average indemnity costs per claim were up 1% in 2015 to $23,500

**Cumulative Change = 140% (1991-2015p)**

<table>
<thead>
<tr>
<th>Accident Year</th>
<th>Cumulative Change</th>
<th>Indemnity Cost ($)</th>
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<tbody>
<tr>
<td>91</td>
<td>+1.0%</td>
<td>$8</td>
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<tr>
<td>92</td>
<td>-3.1%</td>
<td>$9.5</td>
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</tr>
<tr>
<td>13</td>
<td>+1.5%</td>
<td>$23.5</td>
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</table>

1991-2013: Based on data through 12/31/2013, developed to ultimate.
WC Indemnity Severity vs. Wage Inflation, 1995 -2015p

Indemnity severities usually outpace wage gains

WC indemnity severity turned positive again in 2011

Annual Change 1994–2014
Indemnity Claim Sev.: +4.6
US Avg. Weekly Wage: +3.4%

Source: NCCI; Insurance Information Institute
Workers Compensation Medical Severity: Moderate Increase in 2015

Medical severity for lost time claims was down 1% in 2015, the first decline in at least 20 years.

Cumulative Change = 252% (1991-2015p)

2015p: Preliminary based on data valued as of 12/31/2015.
1991-2013: Based on data through 12/31/2014, developed to ultimate
Based on the states where NCCI provides ratemaking services including state funds, excluding WV; Excludes high deductible policies.
Annual Inflation Rates, (CPI-U, %), 1990–2017F

Inflation peaked at 5.6% in August 2008 on high energy and commodity crisis. The recession and the collapse of the commodity bubble reduced inflationary pressures in 2009/10.

Inflationary expectations have slipped (due in part to falling energy costs) allowing the Fed to maintain low interest rates.

Slack in the U.S. economy and falling energy prices suggests that inflationary pressures should remain subdued for an extended period of times.

Sources: US Bureau of Labor Statistics; Blue Chip Economic Indicators, 4/16 (forecasts).
Workers Compensation
Change in Medical Severity
Comparison to Change in Medical Consumer Price Index (CPI)

Percent Change

Average Annual Change: 1994—2015
Lost-Time Medical Severity: +5.9%
US Medical CPI: +3.6%

2015p: Preliminary based on data valued as of 12/31/2015.
Sources: Severity: 995-2013: Based on data through 12/31/2014, developed to ultimate
Based on the states where NCCI provides ratemaking services including state funds, excluding WV; Excludes high deductible policies.
WC Medical Severity Generally Outpaces the Medical CPI Rate

Average annual increase in WC medical severity from 1995 through 2015 was well above the medical CPI (5.9% vs. 3.6%), but the gap has narrowing. Lost-time medical severities appear to on the rise again.

Medical Cost Inflation vs. Overall CPI, 1995 – 2014*

Though moderating, medical inflation will continue to exceed inflation in the overall economy.

Average Annual Growth Average
1995 – 2013
Healthcare: 3.8%
Total Nonfarm: 2.4%

*July 2014 compared to July 2013.
U.S. health care expenditures have been on a relentless climb for most of the past half century, far outstripping population growth, inflation of GDP growth.

From 1965 through 2013, US health care expenditures had increased by 69 fold. Population growth over the same period increased by a factor of just 1.6. By 2022, health spending will have increased 119 fold.

Health care expenditures as a share of GDP rose from 5.8% in 1965 to 18.0% in 2013 and are expected to reach 19.9% of GDP by 2022.

Since 2009, health expenditures as a % of GDP have flattened out at about 18%—the question is why and will it last?

Commercial Lines Pricing Trends

Survey Results Suggest Commercial Pricing Has Flattened Out
CIAB: Average Commercial Rate Change, All Lines, (1Q:2004–4Q:2015)

(Percents)

Q2 2011 marked the last of 30th consecutive quarter of price declines

Pricing as of Q4:2015 remained somewhat negative

KRW Effect

Note: CIAB data cited here are based on a survey. Rate changes earned by individual insurers can and do vary, potentially substantially.

Source: Council of Insurance Agents & Brokers; Insurance Information Institute
Change in Commercial Rate Renewals, by Account Size: 1999:Q4 to 2015:Q4

Percentage Change (%)

Peak = 2001:Q4
+28.5%

Pricing Turned Negative in Early 2004 and Remained that way for 7 ½ years

Trough = 2007:Q3
-13.6%

Pricing turned positive in Q3:2011, the first increase in nearly 8 years; Q4:2015 renewals were down 2.8%; Some insurers posted stronger numbers.

KRW : No Lasting Impact

Note: CIAB data cited here are based on a survey. Rate changes earned by individual insurers can and do vary, potentially substantially. Source: Council of Insurance Agents and Brokers; Barclay's Capital; Insurance Information Institute.
Cumulative Qtrly. Commercial Rate Changes, by Account Size: 1999:Q4 to 2015:Q4

1999:Q4 = 100

Pricing for smaller accounts has more stable than for larger accounts

Note: CIAB data cited here are based on a survey. Rate changes earned by individual insurers can and do vary, potentially substantially.
Source: Council of Insurance Agents and Brokers; Barclay's Capital; Insurance Information Institute.
Change in Commercial Rate Renewals, by Line: 1999:Q4 to 2015:Q4

Percentage Change (%)

Commercial Auto is currently experiencing the strongest rate trend, supplanting WC

Peak = 2001:Q4

Note: CIAB data cited here are based on a survey. Rate changes earned by individual insurers can and do vary, potentially substantially. Source: Council of Insurance Agents and Brokers; Barclay's Capital; Insurance Information Institute.
Cumulative Qtrly. Rate Changes, by Line: 1999:Q4 to 2015:Q4

1999:Q4 = 100

Chart prepared by Barclays Research

Commercial Auto is currently experiencing the strongest rate trend, supplanting WC

Note: CIAB data cited here are based on a survey. Rate changes earned by individual insurers can and do vary, potentially substantially.
Source: Council of Insurance Agents and Brokers; Barclay’s Capital; Insurance Information Institute.
Change in Commercial Rate Renewals, by Line: 2015:Q4

Major Commercial Lines Renewals Were Mixed to Down in Q4:2015; EPL, D&O and Commercial Auto Saw Gains

Note: CIAB data cited here are based on a survey. Rate changes earned by individual insurers can and do vary, potentially substantially. Source: Council of Insurance Agents and Brokers; Insurance Information Institute.
Workers Comp and the ‘Gig’ Economy: An Update

The On-Demand Economy Will Transform the American Workforce and the P/C Insurance Industry Too
The Sharing Economy Has Grown—and Attracted Political Scrutiny
"Many Americans are making extra money renting out a spare room, designing a website ... even driving their own car. This on demand or so called 'gig' economy is creating exciting opportunities and unleashing innovation, but it's also raising hard questions about workplace protections and what a good job will look like in the future."

--Hillary Clinton, July 13, 2015
In California, Uber Driver Is Employee, Not Contractor

A driver for Uber is an employee, not a contractor, according to a California Ruling that eventually could push up costs for the smartphone-based ride hailing service and hurt the closely watched start-up's valuation.

The California Labor Commissioner's decision could ripple through the burgeoning industry of providing services via smartphones, with potential implications for other “crowdsourced” services such as Uber rival Lyft, chore service TaskRabbit, and cleaning service Homejoy.

--Reuters, June 18, 2015
Percent of Americans Who Have Engaged in the “Gig/Sharing Economy” by Transaction


About 22% of Americans have offered services in the sharing economy

Drivers have significant WC exposures

Service platforms have the most direct link to WC; 11% of Americans have offered their services
Americans Who Offer Services in the Sharing/Gig Economy Are Statistically More Prone to Workplace Injury

Young, Urban Minority Males Are the Most Likely to Offer their Services in the Sharing Economy

Age of People Who are Providing the Sharing/On-Demand Economy

- 65+ 16%
- 55 to 64 8%
- 45 to 54 14%
- 35 to 44 24%
- 25 to 34 24%
- 18 to 24 14%

Being a provider of services in the Sharing/On-Demand Economy is attractive to workers in the 25-44 age range (who want flexibility in raising families) as well as seniors age 65+ who see the offering their services on-demand as a way to augment retirement income.

About 7% of US population are providers in the Sharing Economy, cutting across age and incomes; **51% of those familiar with the concept could see themselves as providers within the next two years.**

Sources: PwC survey of 1,000 adults in the U.S., conducted online, December 2014; Insurance Information Institute.
Household Income: Providers of the Sharing/On-Demand Economy

Being a provider of services in the Sharing/On-Demand Economy is particularly attractive to workers with household incomes under $50,000.

About 7% of US population are providers in the Sharing Economy, cutting across age and incomes; 51% of those familiar with the concept could see themselves as providers within the next two years.

Sources: PwC survey of 1,000 adults in the U.S., conducted online, December 2014; Insurance Information Institute.
Americans Love Working in the Sharing Economy but Many Feel Exploited

Despite general satisfaction with sharing economy as an “industry,” there is a sense that workers are being exploited—especially by the workers themselves.

Opinions Are Split on Whether the Sharing Economy Needs More Regulation

<table>
<thead>
<tr>
<th></th>
<th>Favor Regulation</th>
<th>Don’t Know</th>
<th>Oppose Regulation</th>
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<tr>
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<td>47%</td>
<td>4%</td>
<td>49%</td>
</tr>
<tr>
<td><strong>Casual offerers</strong>*</td>
<td>36%</td>
<td>15%</td>
<td>49%</td>
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<tr>
<td><strong>General population</strong></td>
<td>37%</td>
<td>28%</td>
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</tbody>
</table>

The most frequent offerers of services through online platforms are equally divided over the need for more regulation.

THE ‘INTERNET OF THINGS’

Capturing Economic Value Amid a Shifting Insurer Value Chain
The Internet of Things and the Insurance Industry Value Chain

Who owns the data? Where does it flow? Who does the analytics? Who is the capital provider?

The ‘Internet of Things’ and ‘The Insurance-Net of Things’
The Insurance Industry’s Future Is in the Cloud…

Aviation

Marine Transport

Rail & Public Transport

Trucking & Fleet Vehicles

Private Motor Vehicles

The Cloud
The Insurance Industry’s Future Is in the Cloud…

The Cloud

Aviation

Human Beings

Rail & Public Transport

Trucking & Fleet Vehicles

Marine Transport

Private Motor Vehicles
Wearables and Beyond…

Where The Internet of Things Meets Worker Comp
Wearables Show Significant Potential to Reduce Workplace Injury, Death

- Wearables Today Can Monitor:
  - Location
  - Heart rate
  - Temperature
  - Steps/Exertion
  - Sweat
  - Sleep

- In the Near Future Could Monitor:
  - Glucose level
  - Oxygen levels
  - Pain
  - Nausea
Beyond Wearables: Ingestibles and Implantables, VR Could Have Big Impacts Too

- **Ingestibles:**
  - Body chemistry
  - View malignancies
  - Detect diseases
  - Medication adherence

- **Implantables**

- **Smart Fabrics**

- **Virtual Reality**
  - Computer simulated reality

- **Augmented Reality**
  - Real world environment supplemented by computer generated inputs
INSURANCE TECHNOLOGY: FIN TECH ZEROES IN

Number and Value of Deals Is Increasing

*In Search of the Elusive Insurance ‘Unicorn’*
Insurance Technology Financing Trend: Change Is Coming

Investment in insurance tech is rising

Insurance tech deals reached a new record in 2016:Q1

Insurance Tech Activity by Area of Interest, 2013 – 2016:Q1

Silicon Valley and the Venture Capital community have the insurance industry in their sights. Most will fail. Some will succeed.

With the ACA in the rear view window, non-health insurance tech accounts for the majority of investment.

Thank you for your time and your attention!

Twitter: twitter.com/bob_hartwig

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