What does change look like?
I.I.I. Mission Statement

Improving public understanding of insurance...

…what it does and how it works
Disruption is Everywhere
Disruption is Everywhere
Catastrophes – increases in frequency and severity

Natural Catastrophes

**Water**
2016 flood loss 6x greater

**Fire**
2015: record year

**Wind**
8 of 10 costliest since 2004
367 tornados Q1/17

**Climate Change**
## Disruption is Everywhere
Catastrophes – increases in frequency and severity

### Man-Made Catastrophes

<table>
<thead>
<tr>
<th>Autos</th>
<th>Cyber</th>
<th>“Induced” Earthquakes</th>
</tr>
</thead>
<tbody>
<tr>
<td>More cars on road</td>
<td>$445 million / year</td>
<td>~950 3.0+</td>
</tr>
<tr>
<td>Distracted driving</td>
<td></td>
<td>60% in OK</td>
</tr>
</tbody>
</table>

~950 3.0+ Earthquakes induced by human activities, with 60% occurring in Oklahoma.
Technology / Digitalization

Sharing Economy

Big Data

The Internet of Things
Economic Uncertainty

Global Growth...

*Since 2008 we've had the longest period of relative trade stagnation since World War II...

US Growth...

GDP 1.6%
Investment Growth

...Monetary vs. Fiscal Policy

- **Monetary**: Low interest rates mean insurers are struggling to meet interest rate guarantees for life insurance and annuities must diversify their investment portfolios
- **Fiscal**: Supply-side debate heating up, i.e., tax reform

* The Peterson Institute for International Economics
Mainland purchases of insurance and related investment policies in the nine months ended September 2016 surged to a record high.
Geopolitics – US
P / C Insurance Industry ROE by Presidential Party Affiliation
1950 - 2016*

ROE

BLUE = Democratic President  RED = Republican President

*2016 data is through Q3
Source: Insurance Information Institute
But State Politics Drives Insurance
And every state is different

Source: R Street Insurance Regulation Report Card, December 2016
Insurance Industry Snapshot
State of Insurance

Top Issues

- Autonomous vehicles
- P2P insurance
- Cybersecurity
- Sharing economy
- Workers’ comp regulation
- Politics
- Overcapitalization (reinsurance)

Catastrophe Costs

- P/C payouts / property losses¹
  - 2015 $15.4 billion
  - 2016 $21.6 billion
- US insured CAT losses
  - 2016 loss up modestly compared with 10-year average $19.1 billion
  - $76.8 billion
  - $21.6 billion

Consolidation / M&A

- Insurance-related deals involving US firms²
  - 564
  - 2015 $101 billion
  - 2016
  - DEALS 500 -11%
  - VALUE $20 billion -80%
- Top issues
  - Autonomous vehicles
  - P2P insurance
  - Cybersecurity
  - Sharing economy
  - Workers’ comp regulation
  - Politics
  - Overcapitalization (reinsurance)

1. PCS;
2. Conning Research
3. S&P Financial

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2. Conning Research
3. S&P Financial
P / C Insurance Industry Combined Ratio
2001 - 2016*

Heavy use of reinsurance lowered net losses

Best combined ratio since 1949 (87.6)

Higher CAT losses, shrinking reserve releases, toll of soft market

Three consecutive years of underwriting profits; first time since 1971-73

A return to more usual underwriting loss


Sources: A.M. Best; ISO, a Verisk Analytics company; I.I.I.
P / C Insurer Portfolio Yields
2002 - 2015

Even as prevailing rates rise in the next few years, portfolio yields are unlikely to rise quickly, since low yields of recent years are “baked in” to future returns.

Sources: NAIC data, sourced from S&P Global Market Intelligence; Insurance Information Institute
Commercial lines are prone to far more cyclical volatility than personal lines.

Note: Data include state funds beginning in 1998

Sources: A.M. Best; Insurance Information Institute
Rising Auto Costs
A force to be reckoned with…
Loss ratios have been rising for a decade
2015 return on net worth is likely close to zero or negative

Source: National Association of Insurance Commissioners data, sourced from S&P Global Market Intelligence; Insurance Information Institute
Double Digit Loss Costs
Auto insurance

From 2014 to 2016, the cost of accidents has risen dramatically. By contrast, consumer prices overall rose 3.9 percent during 2014 and 2015.

Increase in loss costs, 2014:Q4–2016:Q4

<table>
<thead>
<tr>
<th>Category</th>
<th>Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bodily injury</td>
<td>14.2%</td>
</tr>
<tr>
<td>Property damage</td>
<td>15.3%</td>
</tr>
<tr>
<td>Personal injury protection</td>
<td>14.2%</td>
</tr>
<tr>
<td>Collision</td>
<td>13.6%</td>
</tr>
<tr>
<td>Comprehensive</td>
<td>20.7%</td>
</tr>
</tbody>
</table>

Source: Fast Track Monitoring System
More People Working and Driving => More Collisions
2006 - 2016

When people are out of work, they drive less
When they get jobs, they drive to work, helping drive claim frequency higher

Sources: Seasonally Adjusted Employed from Bureau of Labor Statistics; Rolling four-quarter average frequency from ISO, a Verisk Analytics company; Insurance Information Institute
Fixing a Bumper
. . . On an entry-level luxury car (~$35,000)

2014 cost vs 2016 cost

What has changed?

<table>
<thead>
<tr>
<th>Total Incurred</th>
<th>2014</th>
<th>2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grille: distance sensor</td>
<td>$0</td>
<td>$2,818</td>
</tr>
<tr>
<td>Headlamp assembly</td>
<td>394</td>
<td>918</td>
</tr>
<tr>
<td>Mechanical labor</td>
<td>0</td>
<td>108</td>
</tr>
</tbody>
</table>

- Fewer accidents, higher costs
- Parts: 130% higher
- Labor: 18% higher
- Total cost: $1,705 higher

2016 vehicle has LED headlights and adaptive cruise control
Source: Liberty Mutual Insurance
Trucking Trends

• Driver Shortage
  – Laid-off Drivers Aren’t Returning
  – Older, Inexperienced Drivers Entering Force
  – High Turnover Exacerbates Problem
Commercial auto rates fell less in soft cycle and have risen more than overall property / casualty market

Sources: MarketScout, Insurance Information Institute
Energy

Mega Trends and Insurance Impact
PwC’s Five Global Megatrends Challenging the Energy Sector

- Technological breakthroughs
- Climate change
- Demographic changes
- Shift in economic power

Technology Breakthroughs
Blockchain (Internet 2.0)

Energy (oil & gas)
• Enhanced cyber security
• Improved regulatory compliance

Insurance / Risk Management
• Improved customer experience: streamlining policyholder onboarding, policy administration, payments and claims

Source: Deloitte. Blockchain’s future in oil and gas: Transformative or transient?; AM Best, Blockchain Reaction,
Cyber Attacks – No. 2 Global Risk
75% of oil and gas companies were hit by cyber attacks in 2016

Top ten global business risks

- Business interruption, supply chain risk: 43%
- Cyber incidents: 31%
- Natural catastrophes: 28%
- Market developments: 26%
- Changes in legislation and regulation: 19%
- Macroeconomic developments: 15%
- Fire, explosion: 15%
- Loss of reputation or brand value: 14%
- New technologies: 12%
- Theft, fraud, corruption: 12%

Source: Allianz Risk Barometer on Business Risks 2017; Source: Deloitte LLP, Protecting The Connected Barrels. June, 2017
Cyber: Protecting Directors and Officers From Liability
Risk manager to-do’s

• Review D&O policies; present multiple threat scenarios and understand claims processes

• Consider wrap-around coverage – adding cyber risks to an existing policy

• Understand litigation risks – regulatory certifications, employee training, customer notifications, cyber insurance

Source: P/C 360. Sam Friedman. Directors, officers fear personal exposure to ‘cyber nightmare.’ June 28, 2017
Catastrophe Change
Overall Losses From Worldwide Natural Catastrophes in 2016 Totaled $175 Billion, Up From $103 Billion in 2015

Source: © 2017 Munich Re, Geo Risks Research, NatCatSERVICE as of February 2017
The Frequency of Extreme Weather Events is Rising
Number of world natural catastrophes, 1980 - 2016

Number of relevant events by peril

Source: © 2017 Munich Re, Geo Risks Research, NatCatSERVICE as of February 2017
The 2016 Ft. McMurray fire in Alberta, Canada cost $3.6 billion in insured losses.

Increased Heatwaves and Droughts May Lead to More Wildfires

Wildfire losses in the US, 2006 - 2015 (1)

2005 $ millions

(1) Adjusted for inflation
Source: © 2016 Munich Re, Geo Risks Research, NatCatSERVICE
Induced Earthquakes
Oklahoma earthquakes magnitude 3.0 and greater

Number of earthquakes per year

Year
1978 to 1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016

Includes 30 quakes M4.0-4.7
Includes 15 quakes M4.0-4.4
Includes 20 quakes M4.0-5.1; 1 quake M5.8
Includes 3 quakes M4.0-4.8; 1 quake M5.6

~1.6 / year

Earthquake insurance take-up rates increased by over 300 percent from 2006 to 2015 in Oklahoma

Source: USGS-NEIC ComCat & Oklahoma Geological Survey; Preliminary as of Dec. 31, 2016
“The industry collaborates with a range of private and public organizations to research effective responses that reinforce financial, institutional and community resilience.”
Insurance: Leading Through Disruption
Insurance Leadership

Sustainable Business Model

<table>
<thead>
<tr>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
</tr>
</tbody>
</table>

Bank failures: 157

Insurance impairments: 8

Policyholder surplus: $700.9 billion

End 2016

Strong Jobs Pool / Provider

2.5 million employed

Need to fill 400,000+ by 2022

Economic Growth Promoter / Facilitator

$450.3 billion

2.6% US GDP

Premium taxes paid: $19.2 billion

Bond investment: $489 billion

Charity / volunteerism: ↑ 15%

Fundamentals strong – but still susceptible to disruption

# Insurance Disruption

## Technology / digitalization

<table>
<thead>
<tr>
<th>Fundamental changes</th>
<th>Opportunities</th>
<th>Challenges</th>
<th>New market entrants “Uber of insurance”?</th>
<th>Regulatory opportunities / threats</th>
</tr>
</thead>
</table>
| • Future of auto    | • Automation / efficiencies  
• Future of reduced risk pools | • Consumer trust – demonstrate the societal value  
• New product lines (cyber)  
• Emerging technologies | • Lemonade  
– Offered in CA, IL, NY | • Barrier to entry  
• US vs. other less regulated regions  
• Trust pull-back – the sandbox approach |

*New market entrants* 

“Uber of insurance”?

- Lemonade  
  – Offered in CA, IL, NY
InsurTech Disruption: Threat or Opportunity?
Automation efficiencies can have powerful impact on industry

Only nine percent of insurtechs aim to oust incumbents

Future profits as a % of today’s profits, digitizing the business, auto insurance example
InsurTech Startups Have Broad Range... BUT...

- **Risk**
  - Insurance marketplace
    - CoverHound
    - policybazaar
    - turtlemint
    - Coverfox
    - GetInsured
    - policygenius
  - Digital brokers
    - insureon
    - EMBROKER
    - coverwallet
    - FOUNDERSHIELD
  - Peer to peer
    - friendsurance
    - GUEVARA
    - Lemonade
  - Micro-duration coverage
    - trōv
    - Slice
  - Telematics
    - TrueMotion
    - metromile
    - Zendrive

- **Health**
  - Health navigators
    - Welltok
    - Teladoc
    - Accolade
  - Telematics
    - castlighthealth
    - Teladoc
    - GRAND Round's
…With Broad Incumbent Support

<table>
<thead>
<tr>
<th>Company</th>
<th>Funding</th>
</tr>
</thead>
<tbody>
<tr>
<td>etromile</td>
<td>$205 million</td>
</tr>
<tr>
<td>intact, Pacific Insurance</td>
<td>$57 million</td>
</tr>
<tr>
<td>CoverHound</td>
<td>$37 million</td>
</tr>
<tr>
<td>ONE, INC.</td>
<td>$21 million</td>
</tr>
<tr>
<td>policygenius</td>
<td>$4 million</td>
</tr>
</tbody>
</table>

Note: Total funding
Successful Digital Transformation → Holistic Approach
Insurance as an Economic Leader
The Insurance Industry’s Contribution to GDP Now Nearly Equals Banks

Sources: US Bureau of Economic Analysis; Insurance Information Institute
The Yearly Cash Flow to Rebuild Lives and Property is Substantial

Insurers annually pay over a trillion dollars in claims to rebuild lives, property, and businesses.

In 2016 alone, the industry paid

\[
\begin{align*}
$386.4 \text{ billion P/C incurred claims (L + LAE)} & \\
554.7 \text{ Life / annuity benefits} & \\
560.9 \text{ Health insurance benefits} & \\
\hline
= $1.502 \text{ trillion}
\end{align*}
\]

This is equivalent to $125 billion per month.
Major Construction Projects Don’t Start Without Insurance

Boston’s “Big Dig” – at $14 billion, the project was...

• Larger than the original Panama Canal
• More expensive than the “Chunnel” connecting France and England
• Among the carriers who were winning bidders were AIG, Lexington, Zurich-American and Kemper Environmental
• Workforce included 150 general contractors, 600 construction companies
• Worst fear: that a building within 50 feet of the excavation would collapse
As Financial Intermediaries, Insurers Expand the Funds Available to Grow the Economy

As financial intermediaries, insurers convert short-term funds into longer-term investments

- In 2015, the industry converted $71 billion in premium income that was not needed for immediate claims payments into new long-term investments (bonds, mortgages, common and preferred stock, and owned real estate)
As Economies Grow Wealthier, Insurance Market Penetration (Premium as % of GDP) Also Grows

Source: A.M. Best.

Some wealthy countries have penetration rates of 10% and higher

Source: A.M. Best.
Insurance Contributes to Growth by Speeding Recovery

Insurers are “financial first responders”

• Insurance claims administration and payment is the most efficient way to achieve rapid recovery
• Insurers perform this function more quickly and reliably than government or other aid organizations
• This effect benefits not just those directly affected but also the wider community
• After SuperStorm Sandy, 93% of claims were closed within six months
For the Economy, Insurance Is Growing in Importance

• This is because economic activity is increasingly interdependent
  – This translates to an increase in the need for, and the cost of, activities that ensure the functioning of production and consumption (e.g., transportation, information)
  – With modern technology, the vulnerability of these systems and interdependencies increases
Summary

- Disruption causing insurance industry inflection point
- Fundamentals are sound for industry leading through disruption
- Opportunity / risk: define or be defined...