Causes of Recent Reserve Development
About the Presenters

- Fellow of the Casualty Actuarial Society
- Graduate of Illinois State University
- 20 years of experience, primarily in commercial lines
- Reserving studies for:
  - Insurance companies (SAO and financial exams)
  - Captive insurance companies
  - Self-insured entities
- Extensive experience reviewing industry financial statement data and associated trends
- Experience in workers’ compensation, liability lines, medical professional liability and commercial automobile

Erich A. Brandt
Consulting Actuary
Pinnacle Actuarial Resources, Inc.
About the Presenters

- Associate of the Casualty Actuarial Society
- Associate in Risk Management (ARM)
- B.A. Mathematics – Carthage College
- 16 years of experience, primarily in commercial lines
- Reserving studies for:
  - Insurance companies (SAO and financial exams)
  - Captive insurance companies
  - Self-insured entities
  - Public entities
- Funding recommendations for emerging coverages
- Experience reviewing industry financial statement data and associated trends
- Risk margin modeling

Gregory W. Fears Jr.
Consulting Actuary
Pinnacle Actuarial Resources, Inc.
About the Presenters

• Associate of the Society of Actuaries (ASA)
• Member of the American Academy of Actuaries (MAAA)
• Ph.D., Finance, University of Illinois
• M.S., Finance, University of Illinois
• B.S., Actuarial Science, University of Illinois
• Research interests include fixed income modeling, financial risk management of insurers, subrogation and actuarial science
• Teaches courses in commercial property insurance, risk management and analysis of statutory financial statements

Kevin C. Ahlgrim
Associate Professor
Illinois State University
Outline of Presentation

• Current Snapshot of 1-Year Development
• Historical Figures
• Risk of Material Adverse Deviation (RMAD) Background
• RMAD Research
• Conclusions
Reserve Developments and the Role of Actuarial Practice

• Early 2000’s - Many insolvencies and large reserve developments
• Language in Statements of Actuarial Opinion (SAOs) starting to require specific information about the RMAD
• Sarbanes - Oxley Act (2002)
• Nov. 2003 Standard & Poor’s article
• Ensuing soft market after 2003 - not as much attention
Questions Resulting from Scrutiny of Industry Development

• Are reserve developments a cause, a symptom, or a lagging indicator of the industry’s problems?

• Is the actuarial profession (and SAOs) serving the industry properly?

• What is the role of the actuary?
Industry 1 Year Development (Millions) vs. Underwriting Gain / (Loss)
Observations on Reserve Development

- Reserve development generally has an inverse relationship with underwriting gain and net income.

- If and when reserve development for the industry is adverse, we would expect underwriting and income results to be negative.

- Graphs show a slight lag.
Schedule P from a High Altitude!

• Initial incurred is an initial value of held incurred loss, including IBNR, values as of 12/31/xx (12 months old)

• Mature valuation is from a Schedule P several years more mature (limited to 10 years maturity)

<table>
<thead>
<tr>
<th>Year</th>
<th>Initial Incurred</th>
<th>Mature Evaluation</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>1996</td>
<td>$191,083,453</td>
<td>$184,414,055</td>
<td>($6,669,398)</td>
</tr>
<tr>
<td>1997</td>
<td>185,364,188</td>
<td>183,482,815</td>
<td>(1,881,373)</td>
</tr>
<tr>
<td>1999</td>
<td>199,247,464</td>
<td>217,263,186</td>
<td>18,015,722</td>
</tr>
<tr>
<td>2000</td>
<td>211,741,982</td>
<td>234,586,739</td>
<td>22,844,757</td>
</tr>
<tr>
<td>2001</td>
<td>239,347,139</td>
<td>251,545,485</td>
<td>12,198,346</td>
</tr>
<tr>
<td>2002</td>
<td>238,233,905</td>
<td>240,755,339</td>
<td>2,521,434</td>
</tr>
<tr>
<td>2003</td>
<td>253,319,492</td>
<td>235,946,990</td>
<td>(17,372,502)</td>
</tr>
<tr>
<td>2004</td>
<td>270,095,742</td>
<td>241,416,909</td>
<td>(28,678,833)</td>
</tr>
<tr>
<td>2005</td>
<td>286,300,878</td>
<td>260,140,336</td>
<td>(26,160,542)</td>
</tr>
<tr>
<td>2006</td>
<td>267,270,993</td>
<td>244,892,379</td>
<td>(22,378,614)</td>
</tr>
<tr>
<td>2007</td>
<td>286,426,111</td>
<td>267,757,520</td>
<td>(18,668,591)</td>
</tr>
<tr>
<td>2008</td>
<td>323,959,679</td>
<td>306,243,152</td>
<td>(17,716,527)</td>
</tr>
<tr>
<td>2009</td>
<td>293,075,823</td>
<td>281,625,202</td>
<td>(11,450,621)</td>
</tr>
<tr>
<td>2010</td>
<td>292,092,541</td>
<td>286,180,941</td>
<td>(5,911,600)</td>
</tr>
<tr>
<td>2011</td>
<td>325,713,954</td>
<td>316,899,267</td>
<td>(8,814,687)</td>
</tr>
<tr>
<td>2012</td>
<td>313,841,202</td>
<td>304,724,557</td>
<td>(9,116,645)</td>
</tr>
<tr>
<td>2013</td>
<td>300,654,085</td>
<td>294,897,392</td>
<td>(5,756,693)</td>
</tr>
<tr>
<td>2014</td>
<td>314,468,806</td>
<td>310,703,108</td>
<td>(3,765,698)</td>
</tr>
<tr>
<td>2015</td>
<td>325,492,689</td>
<td>324,771,136</td>
<td>(721,553)</td>
</tr>
</tbody>
</table>

| Totals | $5,493,884,875 | $5,362,385,834 | ($131,499,041) |
Adverse industry development coincides with high loss ratios in underwriting cycle.

2002 and 2003 is where the number of companies showing reserve development > 0 or < 0 are closest.
Ten years ago – started looking at the top 30 each year
• Have changed the look and fields collected over the years
• Extensive use of SAOs in collecting data
• Recent changes to the SAO requirements make collecting meaningful data easier
2016 Industry Reserve Development

- Development of net ultimate loss and defense & cost containment expenses (DCC) in accident years 2015 and prior in calendar year 2016 (Schedule P Part 2)

- Overall industry development is favorable, with about $4.7B reserves released

- Analyze 30 groups or unaffiliated singles with most one-year adverse reserve development in calendar year 2016
One-Year Development

Top 30 Industry Change Influenced by a Single Group

$ Billions

Top 30: +$8.5 B
Industry Total: -$4.7 B
## 2016 Top 30 Largest Reserve Developments of P&C Groups - Including Financial Guaranty/Mortgage Guaranty (in 000s)

<table>
<thead>
<tr>
<th>Group #</th>
<th>Source of Adverse Development</th>
<th>One-Year Development</th>
<th>Two-Year Development</th>
<th>Surplus</th>
<th>One-Year Dev. As % of 2015 Surplus</th>
<th>Two-Year Dev. As % of 2014 Surplus</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Jury awards, &quot;social inflation&quot;, medical inflation, tort reforms</td>
<td>4,358,736</td>
<td>6,766,456</td>
<td>22,033,954</td>
<td>24,514,233</td>
<td>26,154,163</td>
</tr>
<tr>
<td>2</td>
<td>Mold and Construction Defect</td>
<td>676,066</td>
<td>-449,512</td>
<td>87,591,334</td>
<td>82,659,792</td>
<td>80,018,849</td>
</tr>
<tr>
<td>3</td>
<td>Long-tailed lines, Construction Defect, new claims system</td>
<td>515,259</td>
<td>709,645</td>
<td>15,537,518</td>
<td>15,095,092</td>
<td>14,868,877</td>
</tr>
<tr>
<td>4</td>
<td>Asbestos and Environmental, mass torts</td>
<td>388,258</td>
<td>326,661</td>
<td>14,290,024</td>
<td>15,239,855</td>
<td>15,312,969</td>
</tr>
<tr>
<td>5</td>
<td>Current economic environment, data, volatility of financial instruments</td>
<td>321,439</td>
<td>-56,976</td>
<td>66,400</td>
<td>66,400</td>
<td>66,400</td>
</tr>
<tr>
<td>6</td>
<td>Asbestos, changes in claims procedures, economic factors</td>
<td>278,217</td>
<td>454,076</td>
<td>5,557,891</td>
<td>5,950,840</td>
<td>6,344,040</td>
</tr>
<tr>
<td>7</td>
<td>New lines of business and geographic expansion</td>
<td>261,536</td>
<td>311,127</td>
<td>2,173,431</td>
<td>2,192,751</td>
<td>2,057,070</td>
</tr>
<tr>
<td>8</td>
<td>Case adequacy, diversity of business, Asbestos and environmental</td>
<td>212,038</td>
<td>-80,774</td>
<td>2,173,431</td>
<td>2,192,751</td>
<td>2,057,070</td>
</tr>
<tr>
<td>9</td>
<td>MPL volatility, Non-Tabular Discounts, changes in mix of business</td>
<td>203,140</td>
<td>209,125</td>
<td>203,140</td>
<td>209,125</td>
<td>193,715</td>
</tr>
<tr>
<td>10</td>
<td>Long-tailed lines, changes in portfolio and reserving practices</td>
<td>187,530</td>
<td>50,079</td>
<td>187,530</td>
<td>209,125</td>
<td>193,715</td>
</tr>
<tr>
<td>11</td>
<td>Asbestos and environmental, court decisions, mass torts</td>
<td>123,638</td>
<td>165,448</td>
<td>1,222,462</td>
<td>1,847,566</td>
<td>1,832,326</td>
</tr>
<tr>
<td>12</td>
<td>None</td>
<td>96,266</td>
<td>83,687</td>
<td>1,446,846</td>
<td>1,460,413</td>
<td>1,456,958</td>
</tr>
<tr>
<td>13</td>
<td></td>
<td>94,960</td>
<td>154,638</td>
<td>1,922,462</td>
<td>1,847,566</td>
<td>1,832,326</td>
</tr>
<tr>
<td>14</td>
<td></td>
<td>75,022</td>
<td>106,858</td>
<td>7,401,802</td>
<td>7,389,692</td>
<td>7,384,027</td>
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<tr>
<td>15</td>
<td>Workers Compensation and Contractors Liability uncertainty</td>
<td>66,433</td>
<td>94,928</td>
<td>1,087,598</td>
<td>1,060,251</td>
<td>999,507</td>
</tr>
<tr>
<td>16</td>
<td>Lack of historical experience, WC exposure, Excess lines exposure</td>
<td>63,739</td>
<td>29,200</td>
<td>183,072</td>
<td>255,998</td>
<td>299,942</td>
</tr>
<tr>
<td>17</td>
<td>Asbestos and Environmental, long-tailed lines, inflation, softening</td>
<td>61,360</td>
<td>-196,049</td>
<td>4,999,582</td>
<td>5,180,006</td>
<td>5,984,036</td>
</tr>
<tr>
<td>18</td>
<td>Catastrophic exposure and concentration of risk</td>
<td>56,295</td>
<td>-14,777</td>
<td>60,969,38</td>
<td>5,796,879</td>
<td>5,655,616</td>
</tr>
<tr>
<td>19</td>
<td>Long-tailed lines, use of various TPAs</td>
<td>55,482</td>
<td>63,419</td>
<td>260,797</td>
<td>268,851</td>
<td>263,641</td>
</tr>
<tr>
<td>20</td>
<td>Rate level adequacy, case reserve variability, long-tailed lines</td>
<td>51,594</td>
<td>41,368</td>
<td>291,103</td>
<td>294,338</td>
<td>289,224</td>
</tr>
<tr>
<td>21</td>
<td>Historical adverse development, policy limits and coverages written</td>
<td>44,714</td>
<td>56,594</td>
<td>660,583</td>
<td>595,482</td>
<td>637,710</td>
</tr>
<tr>
<td>22</td>
<td>Change in reserving practices, and recent increase in claim frequency</td>
<td>42,287</td>
<td>16,315</td>
<td>110,672</td>
<td>115,989</td>
<td>119,326</td>
</tr>
<tr>
<td>23</td>
<td>Mix of business, excess lines, asbestos and environmental</td>
<td>39,517</td>
<td>48,843</td>
<td>355,366</td>
<td>379,231</td>
<td>352,642</td>
</tr>
<tr>
<td>24</td>
<td>Short operating history, changes in mix of business, and rapid growth</td>
<td>39,281</td>
<td>31,809</td>
<td>454,491</td>
<td>420,674</td>
<td>394,753</td>
</tr>
<tr>
<td>25</td>
<td>Lack of credible data, long-tailed lines</td>
<td>39,240</td>
<td>37,135</td>
<td>71,541</td>
<td>48,757</td>
<td>55,217</td>
</tr>
<tr>
<td>26</td>
<td>Contractor's Liability, Trucking Liability, and Livery Liability</td>
<td>36,107</td>
<td>38,161</td>
<td>297,648</td>
<td>314,070</td>
<td>315,591</td>
</tr>
<tr>
<td>27</td>
<td>Changes in claims settlement rates, concentration of risk, significance</td>
<td>35,493</td>
<td>39,184</td>
<td>113,944</td>
<td>118,462</td>
<td>78,544</td>
</tr>
<tr>
<td>28</td>
<td>Catastrophic exposure and long-tailed lines</td>
<td>35,254</td>
<td>42,431</td>
<td>61,694</td>
<td>68,124</td>
<td>73,867</td>
</tr>
<tr>
<td>29</td>
<td>Change in reserving practices, change in mix of business</td>
<td>35,232</td>
<td>39,184</td>
<td>113,944</td>
<td>118,462</td>
<td>78,544</td>
</tr>
<tr>
<td>30</td>
<td>Change in mix of business, rapid growth, change in claims handling</td>
<td>33,680</td>
<td>57,903</td>
<td>50,786</td>
<td>46,819</td>
<td>47,457</td>
</tr>
</tbody>
</table>

**Subtotal (Top 30)**

<table>
<thead>
<tr>
<th></th>
<th>8,527,813</th>
<th>9,176,135</th>
<th>193,116,685</th>
<th>190,725,264</th>
<th>190,983,629</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Industry</td>
<td>-4,662,611</td>
<td>-8,858,030</td>
<td>732,586,452</td>
<td>706,039,048</td>
<td>705,671,837</td>
</tr>
</tbody>
</table>

**Growth in Surplus (Top 30):**

|  | 1.25% | -0.14% |

**Growth in Surplus (Industry):**

|  | 3.76% | 0.05% |
Analysis of Company Developments

• About $8.5B of adverse development over past year for top 30 companies – less than the almost $15.0B in 2008
  • 2008: almost $10.0B is attributable to one company exposed to financial guarantee insurance and credit default swaps
  • 2010: $5.0B is attributable to one company exposed to excess casualty
  • Steadily decreasing from CY 2010 to CY 2013

• Surplus growth from 2015 to 2016 for top 30 companies is 1.25%
  • Industry surplus growth is 3.76%
What line of business do you think experienced the largest amount of adverse development in CY_16 for the top 30?

A  Commercial Automobile Liability (CAL)
B  Workers’ Compensation (WC)
C  Other Liability Occurrence (OL – Occ)
D  Medical Professional Liability Claims Made (MPL – CM)
E  Private Passenger Automobile Liability (PPAL)
CY_2016 – 1-Year Reserve Development - Top 30
## 1-Year Reserve Development by Accident Year by Coverage for Current Top 30

<table>
<thead>
<tr>
<th>Acc Yr</th>
<th>WC</th>
<th>PPAL</th>
<th>CAL</th>
<th>CMP</th>
<th>OL-OCC</th>
<th>PL-OCC</th>
<th>FG/MG*</th>
<th>Subtotal</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prior</td>
<td>396,095</td>
<td>60,946</td>
<td>60,131</td>
<td>116,036</td>
<td>803,473</td>
<td>314,298</td>
<td>116,168</td>
<td>1,867,147</td>
<td>1,983,633</td>
</tr>
<tr>
<td>2007</td>
<td>96,230</td>
<td>-36,919</td>
<td>-4,189</td>
<td>-2,735</td>
<td>66,370</td>
<td>55,918</td>
<td></td>
<td>174,675</td>
<td>174,591</td>
</tr>
<tr>
<td>2008</td>
<td>82,476</td>
<td>-10,366</td>
<td>8,253</td>
<td>-11,924</td>
<td>15,219</td>
<td>22,213</td>
<td></td>
<td>105,871</td>
<td>132,246</td>
</tr>
<tr>
<td>2009</td>
<td>70,877</td>
<td>-50,577</td>
<td>-10,062</td>
<td>-9,348</td>
<td>101,062</td>
<td>39,810</td>
<td></td>
<td>141,762</td>
<td>184,951</td>
</tr>
<tr>
<td>2010</td>
<td>13,018</td>
<td>-68,424</td>
<td>6,540</td>
<td>15,262</td>
<td>146,339</td>
<td>10,925</td>
<td></td>
<td>123,660</td>
<td>165,164</td>
</tr>
<tr>
<td>2011</td>
<td>14,904</td>
<td>-27,636</td>
<td>7,322</td>
<td>8,104</td>
<td>81,659</td>
<td>21,841</td>
<td></td>
<td>106,194</td>
<td>-119,731</td>
</tr>
<tr>
<td>2012</td>
<td>2,143</td>
<td>95,161</td>
<td>104,811</td>
<td>105,284</td>
<td>206,440</td>
<td></td>
<td></td>
<td>517,283</td>
<td>598,630</td>
</tr>
<tr>
<td>2013</td>
<td>-25,968</td>
<td>145,757</td>
<td>308,025</td>
<td>151,377</td>
<td>341,228</td>
<td>-1,156</td>
<td></td>
<td>919,263</td>
<td>795,504</td>
</tr>
<tr>
<td>2014</td>
<td>-46,875</td>
<td>321,648</td>
<td>365,535</td>
<td>210,915</td>
<td>446,432</td>
<td>-12,644</td>
<td></td>
<td>1,285,011</td>
<td>1,492,630</td>
</tr>
<tr>
<td>2015</td>
<td>32,572</td>
<td>1,579,653</td>
<td>445,073</td>
<td>69,832</td>
<td>787,606</td>
<td>-21,253</td>
<td></td>
<td>3,099,140</td>
<td>3,120,184</td>
</tr>
<tr>
<td>Totals</td>
<td>635,472</td>
<td>2,009,243</td>
<td>1,291,439</td>
<td>652,803</td>
<td>2,995,828</td>
<td>433,396</td>
<td>321,825</td>
<td>8,340,006</td>
<td>8,527,802</td>
</tr>
</tbody>
</table>

| % of All Lines | 7.5% | 23.6% | 15.1% | 7.7% | 35.1% | 5.1% | 3.8% | 97.8% |

* Short Tail Line of Business, Prior includes CY development on AY14 & Prior
(values in thousands)
Observations Related to Commercial Auto Liability

CAL Industry 1 Yr Dev (Millions) vs. Net Loss Ratio

Increase in held ultimate loss ratio precedes reserve deterioration
Commercial Automobile - AM Best

Combined Ratio Trend
Commercial Automobile vs Commercial Lines & Total P/C industries

Source: A.M. Best data and research
Frequency Trends

Highway Accidents by Vehicle Type
Bureau of Transportation Statistics (BTS)
Observations Related to Auto Liability

- CY 2016 had 248 writers of CAL with over $1 Million of DWP
  - Of these, 144 writers (58%) experienced adverse development in CY 2016

- CY 2016 had 249 writers of PPAL with over $1 Million of DWP
  - Of these, 129 writers (52%) experienced adverse development in CY 2016
Observations Related to PPAL

PPAL Industry 1 Yr Dev (Millions) vs. Net Loss Ratio

PPAL 1 Yr Dev  PPAL Net Loss Ratio
RMAD - Background

• Reserve development of the Top 30 and the industry highlights the need to understand reserve risk
  – What is the potential for “material” changes in reserve estimates?

• Statement on “Risk of Material Adverse Deviation” – RMAD

• Choice of Materiality “Threshold”
  – Determined by judgment of Appointed Actuary
    • Percent of Surplus
    • Percent of Reserves
    • Dollar amount relative to Company Action Level Risk-Based Capital
    • Dollar amount relative to next lower Risk-Based Capital (RBC) level, if already at Company Action Level
    • Dollar amount to insolvency (minimum capital requirement)
RMAD Location and 2016 Requirements

• Statement of Actuarial Opinion (SAO)
  – Exhibit B: Disclosures
  – Relevant Comments Paragraphs
    • Risk of Material Adverse Deviation
      – Identify materiality standard and basis
      – Explanatory paragraph to describe major risk factors
        » 2013: “If such risk exists” include
        » 2014: include regardless of yes/no disclosure
        » 2015: no significant changes
        » 2016: no significant changes
      – Explicitly state whether or not the actuary reasonably believes there are significant risks and uncertainties that could result in material adverse deviation
      – Do not include:
        • General, broad statements about risks and uncertainties due to economic changes, judicial decisions, regulatory actions, political or social forces
        • Exhaustive list of all potential sources of risks and uncertainties

Source: 2013 - 2016 Practice Notes on P&C SAOs by American Academy of Actuaries COPLFR
<table>
<thead>
<tr>
<th>Group #</th>
<th>Source of Adverse Development</th>
<th>One-Year Amnt. (000's)</th>
<th>Two-Year Amnt. (000's)</th>
<th>% of Surplus</th>
<th>Amnt. (000's)</th>
<th>Yes or No</th>
<th>Actuary: Employee or Consultant?</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td>Jury awards, &quot;social inflation&quot;, medical inflation, tort reforms</td>
<td>1,452,022</td>
<td>2,018,615</td>
<td>20%</td>
<td>1,193,482</td>
<td>Yes</td>
<td>Employee</td>
</tr>
<tr>
<td>(2)</td>
<td>Mold and Construction Defect</td>
<td>347,650</td>
<td>56,746</td>
<td>15% of reserves</td>
<td>1,104,399</td>
<td>No</td>
<td>Consultant</td>
</tr>
<tr>
<td>(3)</td>
<td>Long-tailed lines, Construction Defect, new claims system</td>
<td>303,106</td>
<td>385,537</td>
<td>10% of reserves</td>
<td>1,191,712</td>
<td>No</td>
<td>Consultant</td>
</tr>
<tr>
<td>(4)</td>
<td>Asbestos and Environmental, mass torts</td>
<td>158,487</td>
<td>128,297</td>
<td>10%</td>
<td>593,397</td>
<td>No</td>
<td>Employee</td>
</tr>
<tr>
<td>(5)</td>
<td>Current economic environment, data, volatility of financial instruments</td>
<td>321,439</td>
<td>-56,976</td>
<td>7.6% of reserves</td>
<td>100,000</td>
<td>Yes</td>
<td>Consultant</td>
</tr>
<tr>
<td>(6)</td>
<td>Asbestos, changes in claims procedures, economic factors</td>
<td>172,418</td>
<td>278,242</td>
<td>10%</td>
<td>421,884</td>
<td>Yes</td>
<td>Employee</td>
</tr>
<tr>
<td>(7)</td>
<td>New lines of business and geographic expansion</td>
<td>273,181</td>
<td>353,076</td>
<td>15%</td>
<td>325,224</td>
<td>No</td>
<td>Employee</td>
</tr>
<tr>
<td>(8)</td>
<td>Case adequacy, diversity of business, Asbestos and environmental</td>
<td>105,091</td>
<td>-43,462</td>
<td>10% of reserves</td>
<td>1,723,400</td>
<td>No</td>
<td>Employee</td>
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<tr>
<td>(9)</td>
<td>Long-tailed lines, changes in portfolio and reserving practices</td>
<td>203,140</td>
<td>209,125</td>
<td>---</td>
<td>100,000</td>
<td>Yes</td>
<td>Consultant</td>
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<tr>
<td>(10)</td>
<td>Current economic environment, data, volatility of financial instruments</td>
<td>321,439</td>
<td>-56,976</td>
<td>7.6% of reserves</td>
<td>100,000</td>
<td>Yes</td>
<td>Consultant</td>
</tr>
<tr>
<td>(11)</td>
<td>Asbestos and environmental, court decisions, mass torts</td>
<td>124,456</td>
<td>157,331</td>
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<td>185,152</td>
<td>No</td>
<td>Consultant</td>
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<td>(12)</td>
<td>None</td>
<td>39,140</td>
<td>48,971</td>
<td>20%</td>
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<td></td>
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<tr>
<td>(13)</td>
<td></td>
<td>94,960</td>
<td>154,638</td>
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<tr>
<td>(14)</td>
<td></td>
<td>75,022</td>
<td>106,858</td>
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<tr>
<td>(15)</td>
<td>Workers Compensation and Contractors Liability uncertainty</td>
<td>66,433</td>
<td>94,928</td>
<td>20% of reserves</td>
<td>167,000</td>
<td>No</td>
<td>Employee</td>
</tr>
<tr>
<td>(16)</td>
<td>Lack of historical experience, WC exposure, Excess lines exposure</td>
<td>64,689</td>
<td>91,271</td>
<td>10%</td>
<td>7,283</td>
<td>Yes</td>
<td>Employee</td>
</tr>
<tr>
<td>(17)</td>
<td>Asbestos and Environmental, long-tailed lines, inflation, softening</td>
<td>49,754</td>
<td>-145,258</td>
<td>10%</td>
<td>319,856</td>
<td>Yes</td>
<td>Employee</td>
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<tr>
<td>(18)</td>
<td>Catastrophic exposure and concentration of risk</td>
<td>53,480</td>
<td>-14,038</td>
<td>15% of reserves</td>
<td>175,027</td>
<td>No</td>
<td>Consultant</td>
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<tr>
<td>(19)</td>
<td>Long-tailed lines, use of various TPAs</td>
<td>24,006</td>
<td>36,036</td>
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<td></td>
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<tr>
<td>(20)</td>
<td>Rate level adequacy, case reserve variability, long-tailed lines</td>
<td>51,594</td>
<td>41,368</td>
<td>20%</td>
<td>58,221</td>
<td>No</td>
<td>Consultant</td>
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<tr>
<td>(21)</td>
<td>Historical adverse development, policy limits and coverages written</td>
<td>19,434</td>
<td>29,754</td>
<td>20%</td>
<td>21,815</td>
<td>Yes</td>
<td>Consultant</td>
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<tr>
<td>(22)</td>
<td>Change in reserving practices, and recent increase in claim frequency</td>
<td>22,977</td>
<td>10,559</td>
<td>10%</td>
<td>11,067</td>
<td>Yes</td>
<td>Consultant</td>
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<tr>
<td>(23)</td>
<td>Mix of business, excess lines, asbestos and environmental</td>
<td>28,918</td>
<td>29,865</td>
<td>10%</td>
<td>35,537</td>
<td>Yes</td>
<td>Consultant</td>
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<tr>
<td>(24)</td>
<td>Short operating history, changes in mix of business, and rapid growth</td>
<td>46,956</td>
<td>35,390</td>
<td>20%</td>
<td>90,898</td>
<td>Yes</td>
<td>Consultant</td>
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<tr>
<td>(25)</td>
<td>Lack of credible data, long-tailed lines</td>
<td>39,240</td>
<td>37,135</td>
<td>10%</td>
<td>7,154</td>
<td>Yes</td>
<td>Consultant</td>
</tr>
<tr>
<td>(26)</td>
<td>Contractor's Liability, Trucking Liability, and Livery Liability</td>
<td>22,025</td>
<td>23,278</td>
<td>10% of reserves</td>
<td>16,717</td>
<td>No</td>
<td>Employee</td>
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<tr>
<td>(27)</td>
<td>Changes in claims settlement rates, concentration of risk, significant</td>
<td>35,493</td>
<td>39,133</td>
<td>20%</td>
<td>9,731</td>
<td>Yes</td>
<td>Consultant</td>
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<tr>
<td>(28)</td>
<td>Catastrophic exposure and long-tailed lines</td>
<td>35,254</td>
<td>42,431</td>
<td>20%</td>
<td>12,340</td>
<td>Yes</td>
<td>Consultant</td>
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<tr>
<td>(29)</td>
<td>Change in reserving practices, change in mix of business</td>
<td>13,033</td>
<td>15,249</td>
<td>5%</td>
<td>2,524</td>
<td>Yes</td>
<td>Consultant</td>
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<tr>
<td>(30)</td>
<td>Change in mix of business, rapid growth, change in claims handling</td>
<td>33,680</td>
<td>57,903</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Subtotal (Top 30)  
Total Industry  

When choosing the RMAD threshold as stated in the SAO, who selects the threshold?

A. Appointed Actuary
B. Management
C. Finance/Accounting Department
D. Discussions between Appointed Actuary and management
Several companies list multiple options for the RMAD before specifying why they chose a particular measure
- Selecting the lowest and highest threshold were both observed as well as selections within their range of options

Focus on selecting a particular measure in relation to risk-based capital adequacy levels
- Some actuaries listed options for their RMAD threshold and chose the minimum so long as it was less than the reduction that would lead to Company Action Level RBC

Several companies included purpose and intended use
- Narrative included for the purpose of solvency monitoring or regulatory review/oversight
Specific RMAD Paragraph Disclosures - Materiality

• “Risk of material adverse development in the net loss and loss adjustment expense reserves as of December 31, 2016 is remote, in my opinion due to the reinsurance agreements in place. In my opinion, there is risk of material adverse deviation in the direct and assumed reserve amounts carried by the Company as of December 31, 2016”

• “...stable book of business, strong capital position, low leverage ratio, demonstration of historically adequate reserves...”

• “...is consistent with the figure selected last year.”

• “...the range of reasonable estimates for these liabilities is wide, and the sum of the carried reserves and the materiality standard falls within this range.”
Specific RMAD Paragraph - Risk Factors

• “...exposure to catastrophic weather events and having a concentration of exposure in few states...”

• “...plaintiffs’ expanding theories of liability, the risks inherent in major litigation, and inconsistent emerging legal doctrines.”
  • In relation to asbestos claims

• “...changes in case reserving practices and the recent increase in claim frequency.”
Specific RMAD Paragraph - Risk Factors

• “…unexpected changes in loss emergence patterns in Auto Liability and General Liability…”
  • “…experience in Auto has been driven by an increase in the frequency of large claims as well as a concentration of business in New York…”
  • “…one contributor to the changes for the large General Liability program is the significant growth in exposure ... which appears to have affected claims handling procedures at the TPA.”
  • Good example of risk factor combination

• “Loss development factors ... were based on industry triangles due to the lack of credibility of the Company’s historical experience.”
  • In relation to variability

• “…mold and construction defect/impaired building materials claims…”
RMAD Disclosures Research

- Research question: How are actuaries actually reporting on RMADs?
- Methodology: Review SAOs
- Focus on “objective” information (Exhibit B)
Methodology

• Reviewed SAOs for Affiliated and Unaffiliated companies with 2015 Net Earned Premium from Income Statement > $20 million
• Around 1,100 companies meet this criteria, out of roughly 3,000 companies in 2015
• ISU graduate student of actuarial science input 2015 RMAD information from SAO
Captured SAO Data

• Exhibit B RMAD disclosures
  – #5: Materiality standard in $US
  – #6: Are there significant risks that could result in material adverse deviation?: Yes / No / NA

• Relevant Comments paragraph – Description of basis for materiality threshold

• 2016 follow-up
  – Actual reserve development
  – Threshold breach?
  – Schedule P Part 2

• Addition information on Appointed Actuary
  – Name
  – Appointment date
  – Consultant / Employee
  – Firm / Geography
Who is the Appointed Actuary? (1,112 SAOs)

- Employee: 37.8%
- Consultant: 62.2%
Choosing the Materiality Basis

• What is considered “material” for an insurer?
• Examples include
  – Percent of Surplus
  – Percent of Reserves
  – Dollar amount relative to Company Action Level Risk-Based Capital
  – Dollar amount relative to next lower Risk-Based Capital (RBC) level, if already at Company Action Level
  – Dollar amount to insolvency (minimum capital requirement)
2015 SAO Review: Materiality Threshold Basis

- % of reserves 27.4%
- % of surplus 68.6%
- RBC 3.5%
- Other 0.4%
Materiality Threshold: % of Surplus (763 insurers)

- 44.8% of Surplus
- 6.8% of Surplus
- 8.0% of Surplus
- 26.7% of Surplus
- 2.6% of Surplus
- 4.6% of Surplus
- 6.4% of Surplus

Other % of Surplus / Group part.
Materiality Threshold: % of Reserves (305 insurers)

- 5% of Reserves: 1.0%
- 10% of Reserves: 53.8%
- 15% of Reserves: 38.0%
- 20% of Reserves: 2.3%
- 25% of Reserves: 0.7%
- Other % of Reserves: 4.3%
Which of the following is the MOST relevant for choosing the materiality threshold?

A. Line(s) of business specialization
B. Financial strength
C. Risk tolerance of organization
D. Historical volatility of earnings
E. Use of Reinsurance
### Choosing a Threshold – Regression Results

**Dependent variable = Materiality standard = % of PHS**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient (Std Err)</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>4.1207 (2.4201)</td>
<td>*</td>
</tr>
<tr>
<td>LogAssets</td>
<td>0.5550 (0.1738)</td>
<td>***</td>
</tr>
<tr>
<td>OrgForm (Stock = 1)</td>
<td>1.5813 (0.5285)</td>
<td>***</td>
</tr>
<tr>
<td>Consult = 1</td>
<td>2.4136 (0.4893)</td>
<td>***</td>
</tr>
<tr>
<td>%LongTail</td>
<td>0.0172 (0.0063)</td>
<td>***</td>
</tr>
<tr>
<td>IRIS2</td>
<td>-0.0050 (0.0030)</td>
<td>*</td>
</tr>
<tr>
<td>%Stock</td>
<td>-0.0380 (0.0169)</td>
<td>**</td>
</tr>
</tbody>
</table>
10 Year Industry Loss Development - % of loss est.

Long-tailed liability lines are more uncertain over long periods of time

Source: SNL Financial

HO  WC  MedMal Occ  Oth Liab CM
Threshold Choice and Line of Business

On average, companies specializing in long-tailed lines appear to choose higher thresholds.
Consultants vs. Employees – Threshold Choice

On average, consultants chose higher thresholds.
Is there a risk of material adverse deviation?

- Yes: 32.0%
- No: 68.0%
Modeled Breaches: % of Surplus

Clearly the choice of threshold affects likelihood of breach

- Actual: 6.3%
- 5% of Surplus: 11.2%
- 10% of Surplus: 6.7%
- 15% of Surplus: 4.9%
- 20% of Surplus: 3.9%
- 25% of Surplus: 2.9%
Which type of disclosure provides more information?

A. Low threshold, Affirmative RMAD
B. High threshold, Negative RMAD
C. Equally informative
Across all thresholds, companies specializing in long-tailed lines are more likely to have affirmative RMADs.
Long-Tailed Lines Focus Affects RMAD Response

“Long-tailed lines” include MedMal, Other Liab, and Work Comp

All companies = 32.0%
RMAD Disclosures by Organizational Form

Stock insurer more likely to indicate RMAD
Consultants vs. Employees – Affirmative RMAD

Consultants
- Yes: 28.9%
- No: 71.1%

Employees
- Yes: 37.1%
- No: 62.9%
Breaches by Threshold - % of Surplus (663 SAOs)

<table>
<thead>
<tr>
<th>Percent of Companies that Breached</th>
</tr>
</thead>
<tbody>
<tr>
<td>12%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Threshold</th>
<th>Total</th>
<th>Breach</th>
</tr>
</thead>
<tbody>
<tr>
<td>5% of Surplus</td>
<td>51</td>
<td>6</td>
</tr>
<tr>
<td>10% of Surplus</td>
<td>337</td>
<td>20</td>
</tr>
<tr>
<td>15% of Surplus</td>
<td>61</td>
<td>2</td>
</tr>
<tr>
<td>20% of Surplus</td>
<td>197</td>
<td>15</td>
</tr>
<tr>
<td>25% of Surplus</td>
<td>17</td>
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</table>
Were Breaches Predicted?

<table>
<thead>
<tr>
<th>RMAD Disclosure?</th>
<th>Yes</th>
<th>No</th>
<th>Total</th>
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</thead>
<tbody>
<tr>
<td>Breach</td>
<td>52</td>
<td>16</td>
<td>68</td>
</tr>
<tr>
<td>No Breach</td>
<td>290</td>
<td>726</td>
<td>1,016</td>
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</tbody>
</table>

1,074 Companies

16 insurers said “No RMAD” but still breached their threshold
Is an RMAD disclosure needed?

- Some companies have large surplus and very limited long tailed exposure
- Some companies have explicit limits on their liability
- Certain lines of business rarely, if ever, experience material adverse reserve deviation
  - Low value property or other fast settling lines
Guidance on Materiality

• American Academy of Actuaries (COPLFR) SAO Practice Note on Property and Casualty Loss Reserves

• American Academy of Actuaries Discussion Paper prepared by the Task Force on Materiality

• Actuarial Literature: For Example
  – Materiality and ASOP No. 36: Considerations for the Practicing Actuary – CAS Committee on Valuation, Finance and Investments
Questions
Join Us for the Next APEX Webinar

ORSA: Has Anything Changed?

Join Pinnacle Consulting Actuaries Laura Maxwell and John Wade as they discuss Own Risk Solvency Assessments (ORSA) and examine the regulatory environment, relationship to risk-focused examinations and company reactions to ORSA.

Tuesday, July 18
2:00 p.m. ET
Registration is Open
Final Notes

- We’d like your feedback and suggestions
  - Please complete our survey

- For copies of this APEX presentation
  - Visit the Resource Knowledge Center at Pinnacleactuaries.com
Thank You for Your Time and Attention

Erich A. Brandt, FCAS, MAAA
ebrandt@pinnacleactuaries.com
309.807.2311

Gregory W. Fears Jr., ACAS, MAAA, ARM
gfears@pinnacleactuaries.com
309.807.2316

Kevin C. Ahlgrim, Ph.D., ASA, MAAA
kahlgrim@ilstu.edu
309.438.2727