

Florida Workers Compensation  
Rate Hearing  
October 21, 2015

Assessment of Filed UPC Provision

George Zanjani

# Approach

- Estimate appropriate weighted average cost of capital (WACC) for the Florida market
- Evaluate other inputs to the IRR model
  - investment yields
  - reserve-to-surplus ratio
- Use the IRR model to translate the WACC estimate into an underwriting profit and contingencies (UPC) provision

# WACC for the Florida market

- Estimate a WACC for carriers affiliated with publicly traded holding companies
- Estimate a WACC for privately-owned carriers by adjusting for the private company discount
- Weight together the public WACC and private WACC according to Florida market shares (about 63% public)

## Exhibit II - Cost of Capital Estimates for the Florida Industry

| Source   | Estimates for Public Companies |             |                 |                       |                     |                | Estimates for Total Florida Industry WACC at Different Private Discount Assumptions |      |      |      |             |
|--|--------------------------------|-------------|-----------------|-----------------------|---------------------|----------------|---|------|------|------|-------------|
|  | Year                           | (1)<br>Beta | (2)<br>% Equity | (3)<br>Cost of Equity | (4)<br>Cost of Debt | Public<br>WACC | 20%   | 25%  | 30%  | 35%  | 40%         |
| Duff and Phelps  | 2015                           | 0.86        | -               | 8.29                  | -                   | -              |   |      |      |      |             |
| NCCI   | 2015                           | 0.92        | 0.82            | 7.84                  | 1.85                | 6.76           |   |      |      |      |             |
| Ibbotson Cost of Capital Yearbook (CAPM)                         | 2013                           | 0.79        | 0.76            | 8.14                  | 1.72                | 6.63           |   |      |      |      |             |
| Ibbotson Cost of Capital Yearbook (Fama-French)                  | 2013                           | 0.79        | 0.76            | 7.80                  | 1.72                | 6.37           |   |      |      |      |             |
| Damodaran Online (NYU)   | 2015                           | 0.83        | 0.75            | 6.94                  | 1.90                | 5.69           |   |      |      |      |             |
| <b>Estimates based on 2013 Market Share Distribution</b>         |                                |             |                 |                       |                     |                |   |      |      |      |             |
| <b>Risk Free</b>   |                                |             |                 |                       |                     |                |   |      |      |      |             |
| 50/50 weighting of Geometric and Arithmetic Averages (1926-2014) | 5-year                         | 0.862       | 0.795           | 7.20                  | 2.04                | 6.16           | 6.68  | 6.86 | 7.06 | 7.29 | 7.57        |
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| Ibbotson Cost of Capital Yearbook (CAPM)                         |                                | 0.862       | 0.795           | 8.62                  | 1.72                | 7.19           | 7.83  | 8.04 | 8.28 | 8.56 | <b>8.88</b> |
| Damodaran Online - Adjusted Beta and % Equity                    |                                | 0.862       | 0.795           | 7.13                  | 1.90                | 6.05           | <b>6.58</b>   | 6.75 | 6.95 | 7.18 | 7.45        |

Total Industry WACC is based on 63/37 weighted average of the Public WACC and the private WACC, which is calculated as  $(2)*[(3)/(1-Discount)]+[1-(2)]*(4)$ .

NCCI cost of equity is inferred based on the 4% UPC selection while holding other parameters fixed. Ibbotson cost of debt is also inferred.

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| Damodaran Online - Adjusted Beta and % Equity                    |                                | 0.862       | 0.795           | 7.13                  | 1.90                | 6.05           | <b>6.58</b>   | 6.75 | 6.95 | 7.18 | 7.45        |

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| <b>Estimates based on 2013 Market Share Distribution</b>         | <b>Risk Free</b>               |             |                 |                       |                     |                |   |      |      |      |             |
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Florida-specific beta and equity %

Total Industry WACC is based on 63/37 weighted average of the Public WACC and the private WACC (WACC = (1 - (1 - (2) \* (4) / (1 - (2) \* (4))) \* (3) + (1 - (2) \* (4))).  
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Various estimates of Public WACC

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# Exhibit I - Research on the Private Company Discount

| Study                                      | Years     | Discount   | Type               |
|--|-----------|------------|--------------------|
| Emory (1994)                               | 1992-1993 | 45%        | IPO                |
| Willamette Management Associates (various) | 1975-1997 | 29% to 60% | IPO                |
| Koeplin et al. (2000)                      | 1984-1998 | 20% to 30% | Acquisitions       |
| Paglia and Harjoto (2010)                  | 1993-2008 | 65% to 70% | Acquisitions       |
| Silber (1991)                              | 1981-1988 | 34%        | Restricted Stock   |
| Johnson (1999)                             | 1991-1995 | 20%        | Restricted Stock   |
| Bajaj et al. (2001)                        | 1990-1995 | 7%         | Private placements |
| Comment (2012)                             | 2004-2010 | 5% to 6%   | Private placements |



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# IRR Model Review

- Used to convert WACC estimates into UPC provisions
- Variety of inputs including payout patterns, reserve-to-surplus ratio, and expense ratios.
- “Static” yields or “Dynamic” yields?
  - Static yields reflect current spot yields
  - Dynamic yields based on Moody’s forecast
  - Key question: Which yields are consistent with actuarial analysis?

Spot yields are consistent with low current inflation and expectations of low future inflation.

Moody’s forecast anticipates significant increases in yields and inflation, neither of which is contemplated in actuarial analysis.

# UPC Provisions Calculated Using IRR Model with Static Investment Yield Assumptions

WACC range of 6.58% to 8.88% produces UPC provision range from 3.67% to 7.34%

# Additional Exhibits

# Long and intermediate yields have been declining for 35 years.

Figure A - US 10-Year Yield, 1-1-1962 to 9-22-2015 (Federal Reserve Bank of St Louis)



Figure B - US 5-Year Treasury Yield, 1/1/1962 - 9/22/2015 (Federal Reserve Bank of St. Louis)



# Long and intermediate yields track with inflation...

Figure C - CPI Inflation: 10-year moving average, 1944-2015

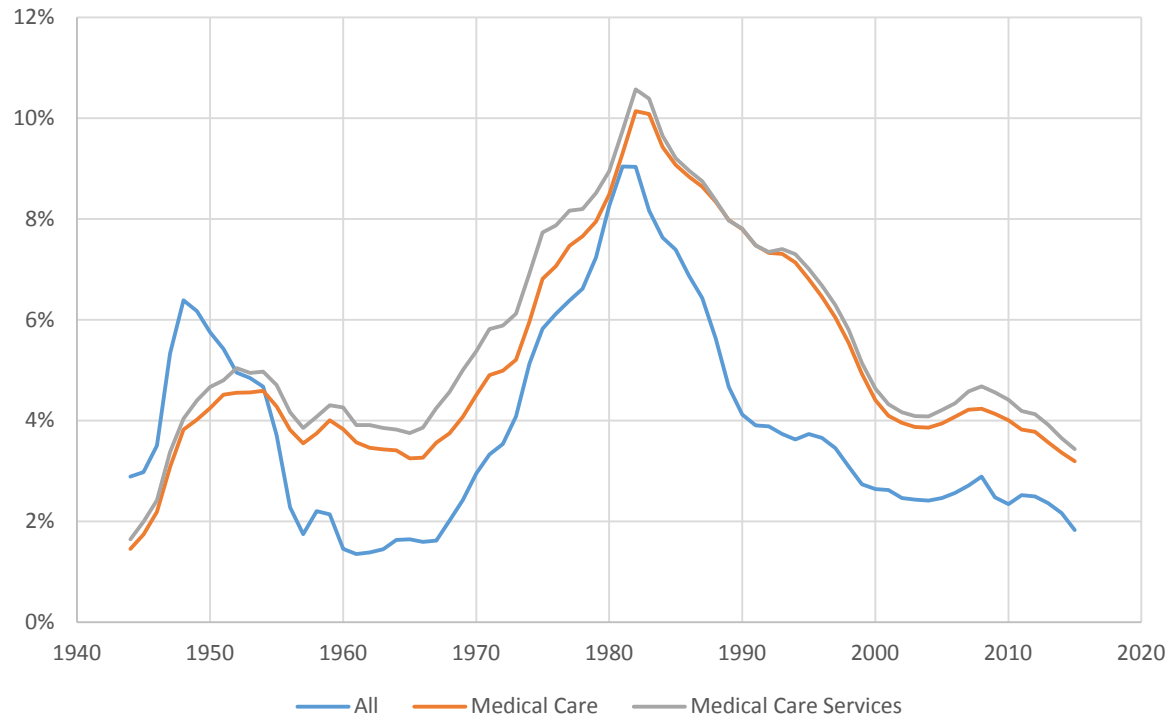
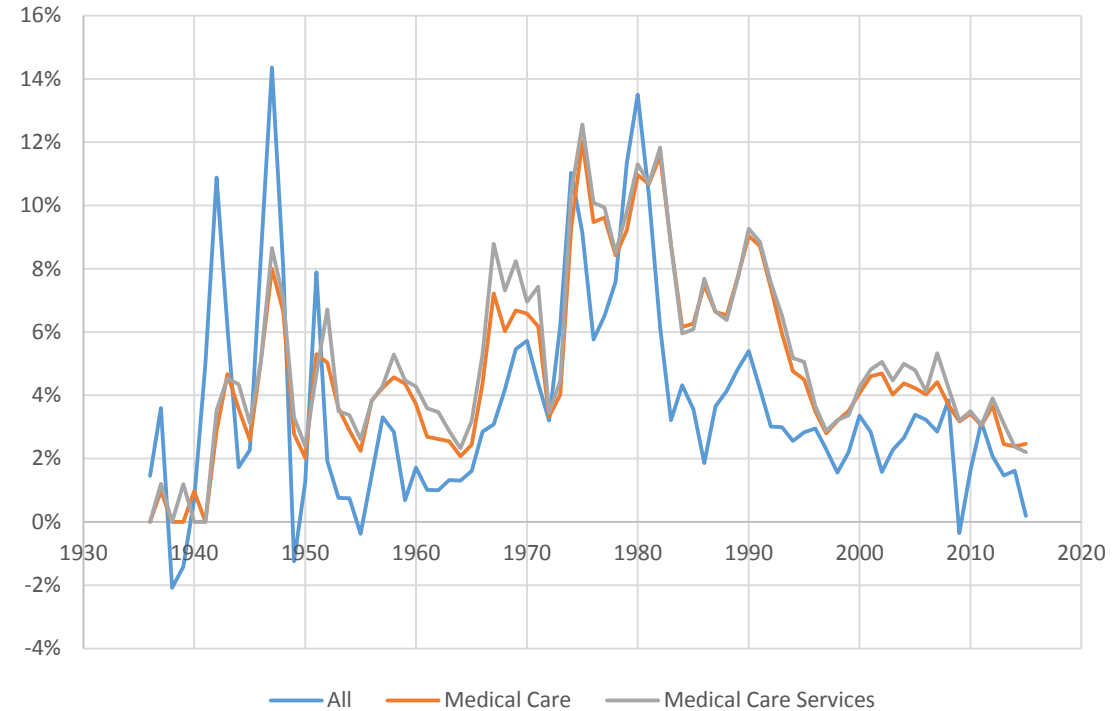


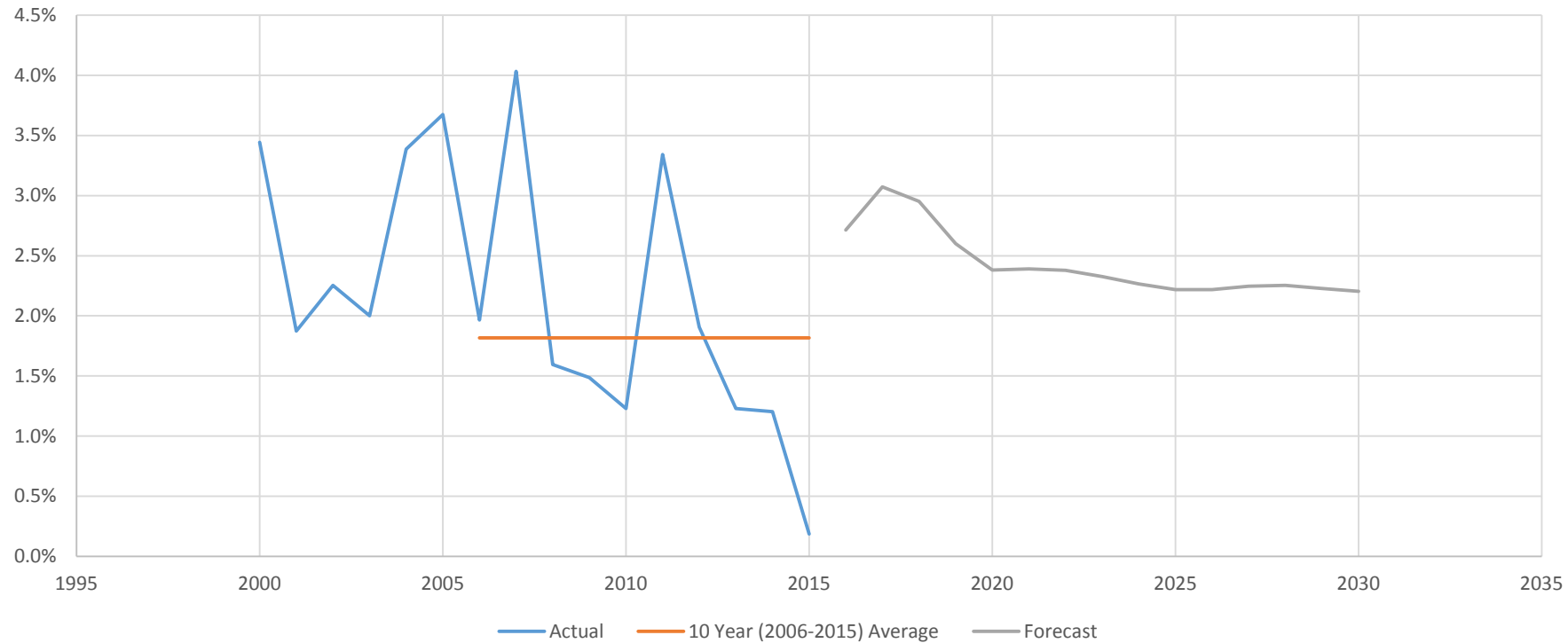
Figure D - Annual CPI, 1935-2015



**...which is running at low levels not seen in decades.**

# Moody's forecast features significant increases in investment yields and significant increases in inflation.

Figure E - Moody's Actual and Forecasted CPI, 2000-2030



AM Best Reserve-to-Surplus Ratios, 1998-2014

