

Florida Workers Compensation Rate Hearing October 18, 2017

Assessment of Filed UPC Provision

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NCCI Internal Rate of Return Model

- Projects cash flows associated with workers compensation policies
 - premiums
 - losses
 - expenses
 - taxes
 - investment income
- Key inputs
 - weighted average cost of capital (WACC) (i.e., the fair rate of return)
 - reserve-to-surplus ratio (how much capital is needed in support)
 - yield on invested assets
 - payout patterns, expense ratios, tax rates, etc.,
- Key model outputs
 - given a WACC and other inputs, solves for the underwriting profit and contingencies (UPC) factor that delivers the WACC
 - given a selected UPC factor and other inputs, solves for the implied WACC

NCCI Indications and Selections

- “Static” Assumptions
 - investment yields and WACC stay at current spot levels
 - post-tax investment yield 2.38%
 - WACC 7.28%
 - **UPC Indication: 2.80%**
- “Dynamic” Assumptions
 - investment yields and WACC rise over time with Moody’s forecast
 - post-tax investment yields: 2.74% to 4.00%
 - WACC: 7.70% to 9.22%
 - **UPC Indication: 1.38%**
- **UPC Selection: 2.00%**
 - implied WACC in static model: 6.86%

Key Questions and Preview of Answers

- What is a reasonable rate of return on capital for the Florida market?
- Does the selection of 2% yield a reasonable rate of return?
 - under NCCI inputs
 - under alternative inputs

Preview of answer: Depending on what inputs you use, the WACC implied by the IRR model ranges from 5.98% to 6.86%. These numbers, in my opinion, are reasonable values for the Florida market.

Approach

- Estimate appropriate weighted average cost of capital (WACC) for the Florida market.
- Evaluate other inputs to the IRR model
 - investment yields
 - asset allocation
 - reserve-to-surplus ratio
- Use the IRR model, under different inputs, to translate the selected underwriting profit and contingencies (UPC) provision into an implied WACC.
- Assess whether the implied WACCs are reasonable based on estimates of the appropriate WACC for the Florida market.

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 66% public)

Exhibit I - History of Property-Casualty WACC Estimates

Source	2015	2016	2017
Damodaran Online			
Cost of Equity	6.9%	7.7%	7.2%
Cost of Debt (Pretax)	3.2%	3.5%	3.5%
Cost of Debt (After Tax)	1.9%	2.1%	2.1%
WACC	5.7%	6.3%	6.0%
Duff & Phelps (Composite)			
Cost of Equity	9.3%	9.7%	8.7%
Cost of Debt (Pretax)	4.0%	4.8%	4.7%
WACC	8.1%	8.7%	7.9%
Duff & Phelps (Median)			
Cost of Equity	8.1%	8.8%	8.4%
Cost of Debt (Pretax)	4.5%	5.5%	4.8%
WACC	7.4%	8.2%	8.0%
NCCI Static Model			
Cost of Equity	7.8%	7.9%	8.4%
Cost of Debt (Pretax)	2.8%	2.7%	3.3%
Cost of Debt (After Tax)	1.9%	1.8%	2.1%
WACC	6.8%	6.8%	7.3%

Source	Beta	Equity Share of Capital Structure	Pretax Cost of Debt
Damodaran Online	0.83	0.76	3.5%
Duff & Phelps (Composite)	0.95	0.84	4.7%
NCCI	0.86	0.82	3.3%
Florida-Specific	0.92	0.78	3.6%

Exhibit II - CAPM Based WACC Estimates for the Florida Industry

Estimates for the WACC for Public Companies						Estimates for Total Florida Industry WACC at Different Private Discount Assumptions				
Source	(1)	(2)	(3)	(4)	(5)	Private Discount				
	Beta	% Equity	Cost of Equity	Cost of Debt	Public WACC	0%	10%	20%	30%	40%
Damodaran Online	0.83	76%	7.2%	2.1%	6.0%	6.0%	6.2%	6.4%	6.8%	7.2%
Duff and Phelps (Composite)	0.95	84%	8.7%	3.7%	7.9%	7.9%	8.2%	8.5%	9.0%	9.6%
NCCI (Static)	0.86	82%	8.4%	2.1%	7.3%	7.3%	7.5%	7.9%	8.3%	8.8%
Florida-specific Figures										
<i>Arithmetic Averaging, T Bill Risk Free Rate</i>	0.92	78%	8.4%	2.3%	7.0%	7.0%	7.3%	7.6%	8.0%	8.5%
<i>Arithmetic Averaging, 10-year Risk Free Rate</i>	0.92	78%	8.0%	2.3%	6.8%	6.8%	7.0%	7.3%	7.7%	8.2%
<i>Geometric Averaging, T Bill Risk Free Rate</i>	0.92	78%	6.7%	2.3%	5.7%	5.7%	5.9%	6.2%	6.5%	6.9%
<i>Geometric Averaging, 10-year Risk Free Rate</i>	0.92	78%	6.5%	2.3%	5.6%	5.6%	5.8%	6.0%	6.4%	6.8%

Duff and Phelps after tax cost of debt is inferred based on the relationship between the WACC and (1) - (3). Florida-specific cost of debt based on pretax figure from Table 1 times 0.65. Florida-specific cost of equity based on Damodaran Online using 1928-2016 data and weighted averages (based on Florida DPW) of Google Finance betas and 2017 Q2 equity shares. Total Industry WACC is based on 66/34 weighted average of the Public WACC and the Private WACC, which is calculated as $(2) * [(3) / (1 - \text{Discount})] + [1 - (2)] * (4)$.

Evaluation of Other Inputs

- Reserve-to-surplus ratio
 - NCCI uses 5-year average from Commercial Casualty Composite
 - Alternative: Weighted average based on Florida DPW
- Invested Asset Allocation
 - NCCI uses current figures for Commercial Casualty Composite
 - Alternative: Weighted average based on Florida DPW
- Investment yields
 - NCCI
 - Treasuries – 1Q17 yields
 - Corporates/Munis – Treasury curve plus historical average spreads
 - Stocks – based on CAPM
 - Alternative
 - Treasuries – current market yields
 - Corporates/Munis – current market yields

Other Inputs – Summary of Findings

- Reserve-to-surplus ratio
 - NCCI: 1.87
 - Alternative: Weighted average based on Florida DPW
 - 5 year average: 1.38
 - 21 year average: 1.69
- Invested Asset Allocation
 - NCCI: Commercial Casualty Composite
 - Alternative: Weighted average based on Florida DPW
 - Alternative allocation:
 - More stock, more cash, safer bonds, shorter maturity bonds
 - Invested asset yield falls from 2.38% to 2.24%
- Investment yields
 - Alternative yields:
 - Higher for short maturity Treasuries, lower for longer term corporates and munis
 - Invested asset yield falls to 2.18%

	Change	Static UPC Indication	Dynamic UPC Indication	WACC Implied by 2.0% UPC
Original Assumptions		2.80%	1.38%	6.86%
Reducing Reserve-to-Surplus Ratio	1.87 to 1.69	3.69%	2.37%	6.45%
Changing Portfolio Allocation Assumption	See Exhibit IV and V	3.44%	2.15%	6.51%
Changing Investment Yield Assumptions and Portfolio Allocation Assumption	2.38% to 2.18% overall	3.72%	-	6.36%
All changes at once		4.63%	3.15%	5.98%

Additional Exhibits

Exhibit III - 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
Finnerty (2013)	1991-1997	21%	Private placements
Finnerty (2013)	1997-2007	15%	Private placements
Chen et al. (2015)	1999-2012	10%	Private placements

John D. Emory, "The Value of Marketability as Illustrated in Initial Public Offerings of Common Stock-February 1992 through July 1993," Business Valuation Review, March 1994, 3-7.

John Koeplin, Atulya Sarin, Alan C. Shapiro (2000), "The Private Company Discount," Journal of Applied Corporate Finance 12, 94-101.

John K. Paglia and Maretno Harjoto (2010), "The Discount for Lack of Marketability in Private Companies: A Multiples Approach," Journal of Business Valuation and Economic Loss Analysis 5(1), Article 5.

William L. Silber (1991), "Discounts on Restricted Stock: The Impact of Illiquidity on Stock Prices," Financial Analyst Journal, July-August 1991, 60-64.

BA Johnson (1999), "Quantitative Support for Discounts for Lack of Marketability" Business Valuation Review 16, 152-55.

Mukesh Bajaj, David J. Denis, Stephen P Ferris, and Atulya Sarin (2001), "Firm Value and Marketability Discounts," Journal of Corporation Law 27, 89-115.

Robert Comment (2012), "Revisiting the Illiquidity Discount: A New (and Skeptical) Restricted Stock Study," Journal of Applied Corporate Finance 24, 80-91.

John D. Finnerty (2013), "The Impact of Stock Transfer Restrictions on the Private Placement Discount," Financial Management 42, 575-609.

Chen, Linda H., Edward A. Dyl, George J. Jiang, and Januj A. Juneja (2015), "Risk, Illiquidity, or Marketability: What Matters for the Discounts on Private Placements?" Journal of Banking and Finance 57, 41-50.

* The Willamette research studies were unpublished but reported in Business Valuation Discounts and Premiums, Chapter 5, by Shannon Pratt (New York: John Wiley & Sons, Inc., p. 85).

Exhibit IV - Comparison of Investment Portfolio Distributions				
	Original NCCI Static Inputs Based on Commercial Casualty Composite		Inputs Based on 2016 Florida Market Share	
Security Description	(%) Bond Portfolio	(%) Invest Portfolio	(%) Bond Portfolio	(%) Invest Portfolio
Bonds, of which		73.8%		72.7%
<i>Government Direct Obligations</i>	9.2%	6.8%	16.3%	11.9%
<i>Collateralized Securities</i>	9.2%	6.8%	15.9%	11.6%
<i>Tax-exempt Bonds</i>	34.5%	25.5%	29.1%	21.2%
<i>Industrial and Hybrid Securities (unaffiliated)</i>	45.1%	33.3%	38.2%	27.8%
<i>Industrial and Hybrid Securities (affiliated)</i>	2.1%	1.5%	0.5%	0.4%
Common Stock		11.9%		13.8%
Preferred Stock		0.4%		0.4%
Cash & Short-Term Investments		3.8%		8.8%
All Other Assets		10.1%		4.3%
Total	100.0%	100.0%	100.0%	100.0%

Exhibit V - Comparison of Investment Portfolio Distributions						
Security Description	Original NCCI Static Inputs Based on Commercial Casualty Composite			Inputs Based on 2016 Florida Market Share		
	(%) Bond Portfolio	(%) Maturity Buckets		(%) Bond Portfolio	(%) Maturity Buckets	(%) Invest Portfolio
Bonds, of which	73.8%			72.7%		
Government Direct Obligations	9.2%	6.8%		16.3%	11.9%	
< 1yr		27.9%	1.9%		45.1%	5.3%
1 – 5 yrs		42.8%	2.9%		36.9%	4.4%
5 – 10 yrs		19.5%	1.3%		12.5%	1.5%
10 – 20 yrs		4.4%	0.3%		2.0%	0.2%
> 20 yrs		5.4%	0.4%		3.5%	0.4%
Collateralized Securities	9.2%	6.8%		15.9%	11.6%	
< 1yr		12.8%	0.9%		14.5%	1.7%
1 – 5 yrs		37.6%	2.6%		35.6%	4.1%
5 – 10 yrs		26.6%	1.8%		24.2%	2.8%
10 – 20 yrs		16.7%	1.1%		16.7%	1.9%
> 20 yrs		6.3%	0.4%		8.9%	1.0%
Tax-exempt Bonds	34.5%	25.5%		29.1%	21.2%	
< 1yr		8.7%	2.2%		8.5%	1.8%
1 – 5 yrs		24.6%	6.3%		23.0%	4.9%
5 – 10 yrs		31.1%	7.9%		43.6%	9.2%
10 – 20 yrs		26.2%	6.7%		16.1%	3.4%
> 20 yrs		9.4%	2.4%		8.7%	1.8%
Industrial and Hybrid Securities (unaffiliated)	45.1%	33.3%		38.2%	27.8%	
< 1yr		13.2%	4.4%		13.5%	3.7%
1 – 5 yrs		39.9%	13.3%		44.4%	12.3%
5 – 10 yrs		35.8%	11.9%		37.4%	10.4%
10 – 20 yrs		4.5%	1.5%		2.9%	0.8%
> 20 yrs		6.7%	2.2%		1.8%	0.5%
Industrial and Hybrid Securities (affiliated)	2.1%	1.5%		0.5%	0.4%	
< 1yr		96.7%	1.5%		0.0%	0.0%
1 – 5 yrs		0.4%	0.0%		44.7%	0.2%
5 – 10 yrs		0.7%	0.0%		34.1%	0.1%
10 – 20 yrs		0.0%	0.0%		0.0%	0.0%
> 20 yrs		2.1%	0.0%		21.2%	0.1%
Common Stock		11.9%			13.8%	
Preferred Stock		0.4%			0.4%	
Cash & Short-Term Investments		3.8%			8.8%	
All Other Assets		10.1%			4.3%	
Total		100.0%			100.0%	

Exhibit VI - NCCI Static Yields and Alternative Estimates							
	NCCI (Pretax)		ALTERNATIVE Estimates				
			Source:	US Treasury	Selection		
Government Obligations							
< 1yr	0.7%			1.2%	1.2%		
1 – 5 yrs	1.4%			1.6%	1.6%		
5 – 10 yrs	2.3%			2.1%	2.1%		
10 – 20 yrs	2.6%			2.4%	2.4%		
> 20 yrs	2.8%			2.7%	2.7%		
Tax Exempt Obligations			Source:	Bloomberg (AAA)	FMS Bonds (A)	AP MBI (IG)	
< 1yr	0.9%					0.9%	
1 – 5 yrs	1.6%			1.0%		1.1%	1.4%
5 – 10 yrs	2.5%			1.6%		1.8%	2.1%
10 – 20 yrs	3.0%			2.2%	2.8%	2.5%	2.8%
> 20 yrs	3.2%			2.6%	3.1%	2.8%	3.1%
Industrial and Hybrid			Source:	Treasury HQM	B of A/Merrill Lynch (IG)		
< 1yr	1.5%			1.4%			1.4%
1 – 5 yrs	2.5%			1.9%	2.2%		2.2%
5 – 10 yrs	3.7%			2.9%	3.2%		3.2%
10 – 20 yrs	4.1%			3.7%	3.8%		3.8%
> 20 yrs	4.3%			4.1%	4.3%		4.3%
Notes: Yields from the alternative sources are set, via linear interpolation, to the midpoint of the maturity ranges, with 0.5 years assumed for obligations <1 yr and 25 years assumed for obligations with maturities greater than 20 years. B of A/Merrill Lynch series based on FRED data, for the 1-3 year, 3-5 year 5-7 year, 7-10 year, 10-15 year, and 15+ year maturities for investment grade yields. All alternative estimates were pulled in the week of 9/20/17. Source websites: US Treasury - https://www.treasury.gov/resource-center/data-chart-center/interest-rates/Pages/TextView.aspx?data=yield Bloomberg (AAA) - https://www.bloomberg.com/markets/rates-bonds/government-bonds/us FMS Bonds (A) - https://www.fmsbonds.com/market-yields/ AP MBI (IG) - https://emma.msrb.org/ToolsAndResources/MBISYieldCurve?daily=False Treasury HQM - https://www.treasury.gov/resource-center/economic-policy/corp-bond-yield/Pages/Corp-Yield-Bond-Curve-Papers.aspx B of A/Merrill Lynch (IG) - https://fred.stlouisfed.org/release?rid=209&t=corporate&ob=pv&od=desc							