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TILLINGHAST

CAPTIVES AND RELATED PRICING ISSUES

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March 9, 2007

CAPTIVE AND RELATED PRICING ISSUES

- The Actuary's Role
- Captive Metrics
- Ratemaking Issues
- Ratemaking Examples
- Current Issues

The Actuary's Role

- Captive Formation
- Ongoing Management
- Compliance

The Actuary's Role – Captive Formation

- Develop feasibility study
  - Estimate losses for the projected exposures
  - Create pro forma models
- Work with potential owner and advisory team to refine the submission; application includes:
  - Business Plan
  - Feasibility Study
  - Parent Company Information
  - Bylaws & Articles
  - Underwriting & Safety Procedures
  - Details of Service Providers
- Respond to regulatory questions
- Timing – 3 to 6 months

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The Actuary's Role – Captive Formation

- What makes a captive non-feasible
  - Unfavorable loss experience
  - Organizational and ongoing costs
  - Capital investment
  - Long term vehicle
  - Management oversight

The Actuary's Role – Ongoing Management

- Develop reserve estimates and funding
- Create allocation models
- Evaluate potential new coverages/members
- Analyze reinsurance structures
- Attend Board meetings

The Actuary's Role - Compliance

- Develop liability estimates as required by the domicile
- Provide actuarial statement of opinion
  - Actuary may need prior approval
  - Timing varies by domicile and/or captive structure
- Coordinate with external auditors

Captive Metrics

- Surplus adequacy is the critical standard
  - Needs to consider the type of risk and the type of captive
  - Surplus can “reside” in the surplus account or the loss reserve account
- Loss reserve adequacy is key: for captives, they typically represent 90% or more of the liabilities
- Premiums need to at least cover expenses and the present value of losses; many captives price with a risk margin

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Captive Metrics

- There are long-term advantages to prudent pricing
  - Flexibility with respect to program structure
  - Increasing the ability to add new members to a group captive or provide additional coverage
  - Respond to unusual adverse situation
  - Solvency requirements

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Captive Metrics

- Some key financial ratios are:
  - The premium to surplus ratio, which reflects a company's exposure to pricing errors; a range of "normal" leverage ratios for captives is shown below

PREMIUM-TO-SURPLUS RATIOS	
Long-tail casualty business (below $10 million annual premium)	1:1 – 4:1
Short-tail casualty business (e.g., claims made)	2:1 - 5:1
Property-type coverages — non-CAT	2:1 - 5:1
Property-type coverages — CAT	Less than 1:1
Low-frequency, high-severity casualty (e.g., excess of loss)	2:1 – 5:1
High-frequency, low-severity losses (e.g., primary)	Up to 5:1

Source: Tillinghast TRACS

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Captive Metrics

- The reserves-to-surplus ratio, which measures a company's exposure to reserve errors. A range of reserve-to-surplus ratios is shown below.

LOSS RESERVES-TO-SURPLUS RATIO	
Long-tail casualty business	3:1
Short-tail business	5:1
Mixed (not predominantly one of the above)	4:1

Source: Tillinghast TRACS

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Captive Metrics

- Risk retention to surplus ratio – A number of domiciles use the “10% rule” (i.e., a company may not expose more than 10% of its surplus to any single risk or loss)

RISK RETENTION-TO-SURPLUS RATIO

Captive Type and Exposure	Retention-to-Surplus Ratio	Implied Surplus Requirement Based on $500,000 Retention
Single-owner, non-casualty, non-catastrophe	200%	$250,000
Single-owner, low-frequency casualty	Up to 100%	$500,000
Group captive, small sophisticated membership, low-frequency casualty	Up to 50%	$1,000,000
Group captive, small membership of midsized insureds	Up to 25%	$2,000,000
Small captive, broad membership of small insureds	Up to 10%	$500,000

Source: Tillinghast TRACS

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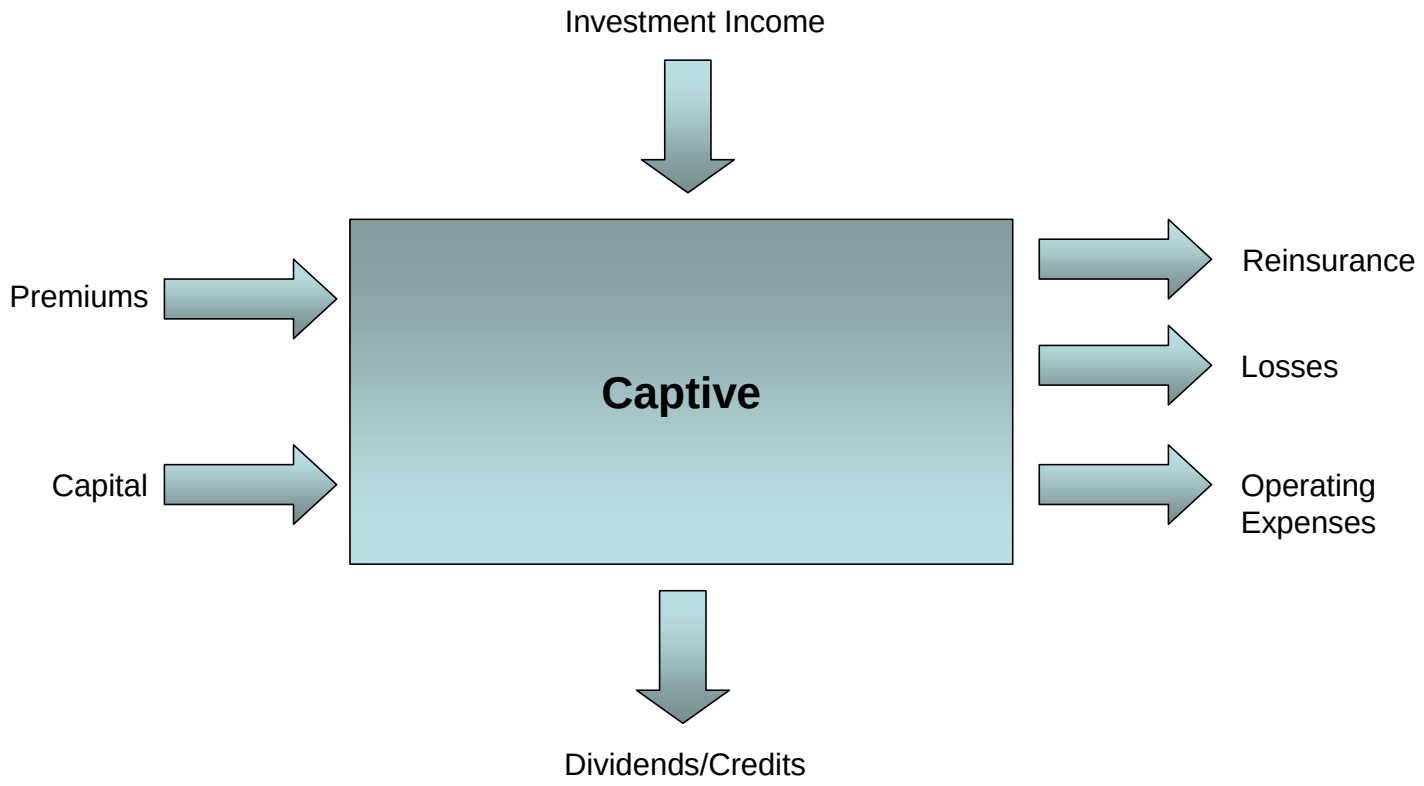
Captive Metrics – Characteristics of Successful Captives

- Well identified objective
- Realistic expectations
- Prudent funding
- Long-term commitment
- Reasonable administrative expenses
- Proactive claims administration
- Involved, committed Board

Ratemaking Issues – Cash Flows

The following chart shows simplified captive cash flows.



Ratemaking Issues – Data

- Minimum requirements
- No closed claims data
- Combined coverage information
- Incomplete/inconsistent exposures
- Missing claim counts
- Partial loss data

Ratemaking Issues – Industry Statistics

- Loss development data
- Size of loss curves
- Trend
- Loss costs
- Statutory changes

Example One – Adding A Coverage to a Captive

- An indemnification policy for a self-insured workers compensation program with a $500,000 per occurrence retention.
- Analysis Approach
  - Calculate losses limited to $100,000
  - Develop a limited pure premium
  - Compare large loss experience to industry
  - Incorporate risk margins, expenses and discounting
- Risk margins may be mandated or elective
  - Closed no pays and/or medical only claims can dampen variability
  - Often data doesn't reflect "unlimited" severity

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Example One – Adding A Coverage to a Captive

Projection of 2007 Pure Premium - Limited to $100K

Accident Year	Estimated Ultimate Loss (000s)	Trend/ Benefit Factor	Trended Ultimate Loss (000s)	Payroll (00s)	Estimated Pure Premium	Estimated Ultimate Counts	Estimated Frequency	Estimated Severity
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
2001	$2,790	1.268	$3,536	$1,400,000	$2.53	610	0.436	$5,797
2002	2,880	1.218	3,509	1,425,000	2.46	630	0.442	5,570
2003	3,560	1.171	4,170	1,480,000	2.82	715	0.483	5,831
2004	3,980	1.126	4,481	1,500,000	2.99	760	0.507	5,896
2005	3,830	1.082	4,145	1,525,000	2.72	800	0.525	5,181
Total	$17,040		$19,841	$7,330,000	$2.71	3,515	0.480	$5,645
		(10) Selected			$2.90			

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Example One – Adding A Coverage to a Captive

- "Typical" captive expenses can include
  - Captive management
  - Excess or reinsurance
  - Claims handling
  - Actuarial, audit, legal fees
  - Taxes
  - Investment expenses
  - LOC costs
  - Other, including travel and domicile charges
- In the example the new coverage is assigned a pro-rata amount of expense
- Discounting
  - Approach varies by domicile
  - Investment yield should consider captive asset structure

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Example One – Adding a Coverage to a Captive

Projection of 2007 Premium

1.	Estimated Payroll (00s)	$1,681,000	
2.	Selected 2007 Pure Premium	2.90	
3.	Increased Limits Factor	1.510	
4.	Expected 2007 Ultimate Losses (000's)	$7,361	
5.	Estimated Expenses (000's)	$250	
6.	Estimated Premium (000's) at	Nominal	Discounted
	a) Expected Level	$7,611	$6,601
	b) 75% Confidence Level	8,347	7,236
	c) 90% Confidence Level	9,819	8,507
	d) 95% Confidence Level	11,292	9,777

Follow-up to Example One – Developing A Pro Forma

- Key Elements
  - Losses – expected and higher confidence levels
  - Expenses
  - Cash flows and investment income assumptions
  - Capitalization – Investible assets vs. LOCs
- Develop Scenario Testing
  - Funding at higher confidence levels and emergence at expected (base case)
  - Variations of more adverse scenarios
    - Loss levels
    - Investment results
    - Combination of above
  - Evaluation of Scenarios
    - Financial position
    - Leverage ratios
    - Captive structure

Follow-up to Example One – Captive Management and Regulatory Compliance

- Baseline for monitoring emergence
- Starting point for reserve analyses and second year funding
- Tool to evaluate alternative reinsurance structures

Example Two – Allocating Premiums for a New Group Captive

- Four physician groups consider establishing a captive
- Analysis approach
  - Data review
  - Develop an ”experience mod”
  - Apply the mod to industry pure premiums
  - Adjust for policy form, retention level, discounting, risk margins and expenses
- Data review
  - Exposure information not provided for all years
  - Average values of open claims do not track average paids, nor does frequency track loss volume
  - Data quality varies

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Example Two – Allocating Premiums for a New Group Captive

Accident Year (1)	Physicians FTEs (7)	Average O/S (9)	Average Paid (10)	Reported Frequency (11)
Practice B				
2001	75	$100,000	$0	0.027
2002		600,000	266,667	#N/A
2003	60	100,000	6,667	0.167
2004		85,714	80,000	#N/A
2005	75	700,000	37,500	0.067
Total	210	$183,333	$85,625	0.162
Practice C				
2001	50	$0	$100,000	0.100
2002	50	12,500	25,000	0.140
2003	50	283,333	30,000	0.160
2004	50	300,000	5,000	0.100
2005	50	33,333	16,667	0.120
Total	250	$86,667	$24,688	0.124
Practice D				
2001	55	$300,000	$350,000	0.055
2002	60	250,000	300,000	0.067
2003	62	900,000	500,000	0.032
2004	65	50,000	12,500	0.077
2005	70	187,500	25,000	0.071
Total	312	$277,778	$187,500	0.061

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Example Two – Allocating Premiums for a New Group Captive

- Experience Mod Approach
  - Determine at what loss limit data is credible
  - Compare actual loss costs with expected loss costs to determine experience modification factor (experience mod)
  - Combine with industry expected loss cost and projected exposures
- Allocate results by practice

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Example Two – Allocating Premiums for a New Group Captive

Calculation of Basic Limits Loss Costs

Accident Year	Basic Limit Losses (000's) (000's)	LDF to Ultimate	Developed Losses (000's)	Base Class Equivalent Exposures	Developed Loss Cost Per Expos. Unit	Basic Limits Industry Expected Loss Cost	Ratio of Actual to Industry Loss Cost	Exposure Weights
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
2001	$1,300	1.163	$1,512	280	$5,399	$18,000	0.300	0.295
2002	2,510	1.250	3,138	285	11,009	19,800	0.556	0.279
2003	870	1.538	1,338	272	4,921	21,780	0.226	0.217
2004	1,545	2.381	3,679	300	12,262	23,958	0.512	0.154
2005	1,665	6.667	11,100	300	37,000	26,354	1.404	0.055
Total	$7,890		$20,766	1,437	$14,451			1.000

(10)	Weighted Average Ratio	0.449
(11)	Credibility	0.350
(12)	Credibility Weighted Average	0.807
(13)	Selected Ratio	0.750
(14)	Industry Loss Cost at 7/07	$30,404
(15)	Experience Modified Loss Cost	$22,803

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Example Two – Allocating Premiums for a New Group Captive

Allocation of Premium (000's)

1. Projected 2007 Premium, $1,000,000 per occurrence limits - discounted funding, 75 $7,561

Practice	Percentage of Exposures	Percentage of Counts	Percentage of Inc. Loss	Selected Allocation Percentage	Allocated Premium
(1)	(2)	(3)	(4)	(5)	(6)
Practice A	35.00%	37.31%	21.83%	31.38%	$3,559
Practice B	25.00%	25.37%	33.99%	28.12%	3,189
Practice C	16.67%	23.13%	12.34%	17.38%	1,971
Practice D	23.33%	14.18%	31.84%	23.12%	2,622
Total					$11,342

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Example Three – Develop Premium Estimates for Non-Traditional Exposures

- Analyze process to generate an insured event
- Develop frequency and severity (or pure premium) estimates
- Consider timing of cash flows, expenses and risk margins

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Example Three – Develop Premium Estimates for Non-Traditional Exposures

Projection of Claim Frequency

1. Estimated Employees	
a. Estimated Payroll (00's)	$4,000,000
b. Average Salary	50,000
c. Estimated Headcount	8,000
A. Direct Exposure (for vaccinated workers)	
2. Estimated % of Workers Vaccinated	1.50%
3. Estimated Number of Vaccinated Workers	120
4. Estimated Percentage of Vaccinated Workers Contracting Smallpox	2.00%
5. Estimated Number of Vaccinated Workers Contracting Smallpox	2
B. Indirect Exposure (non-vaccinated workers exposed by vaccinated workers)	
6. Estimated Percentage of Non-vaccinated Workers exposed to Vaccinated Workers	5.00%
7. Estimated Percentage of Non-vaccinated Workers Contracting Smallpox	1.00%
8. Interaction Effect	1.20
9. Estimated Number of Non-Vaccinated Workers Contracting Smallpox	5
10. Total Projected Claims	7

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Example Three – Develop Premium Estimates for Non-Traditional Exposures

- Assume one of three outcomes
  - Outcome A - fatal claim
  - Outcome B - permanent total claim
  - Outcome C - temporary total claim

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Example Three – Develop Premium Estimates for Non-Traditional Exposures

Calculation of Severity

		Probability
A. Outcome A - Fatal Claim		5%
1. Estimated Lost Wages	$1,333	
2. Estimated Medical Costs	500,000	
3. Estimated Survivor Benefits	1,032,307	
4. Total	$1,533,640	
B. Outcome B - Permanent Total Claim		10%
1. Estimated Lost Wages	$416,212	
2. Estimated Medical Costs	100,000	
3. Estimated Future Medical Costs	141,471	
4. Total	$657,683	
C. Outcome C - Eight Week Injury		85%
1. Estimated Lost Wages	$5,333	
2. Estimated Medical Costs	15,000	
3. Total	20,333	
D. Combined Severity (weighted average of A-C)	$159,734	

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Example Three – Develop Premium Estimates for Non-Traditional Exposures

Calculation of Indicated Funding (000's)

1. Estimated Projected Claims		7	
2. Estimated Average Severity		$160	
3. Estimated Ultimate Losses		$1,100	
4. Risk Margin at			
a. 75% Confidence Level		1.350	
b. 90% Confidence Level		1.700	
c. 95% Confidence Level		2.250	
5. Discount Factor @ 5%		0.866	
6. Expenses		$20	
7. Indicated Funding at	Nominal		Discounted
a. Expected Level	$1,120		$973
b. 75% Confidence Level	1,505		1,306
c. 90% Confidence Level	1,890		1,639
d. 95% Confidence Level	2,495		2,163

Current Issues

- Custom coverage
  - Manuscript polices
  - Exact match of risk to coverage
- Capacity
  - Coverage gaps in existing program
  - Captive structured to provide desired capacity at necessary levels
  - TRIA
- Pricing and reserving implications

Current Issues

- Recent Market Trends
  - RRGs
  - PORCs
  - Cells and various permutations
  - Employee benefits