

BEYOND CONVERGENCE, TOWARDS INTEGRATION - The next steps for the ILS Market

Morton Lane Ph.D. President , Lane Financial LLC Sept 22nd 2008 Sydney



RESEARCH CONFERENCE Monday 22 September 2008 Amora Hotel, Sydney

OUTLINE Beyond Convergence, towards Integration

- Observations on the ILS Market
 - Motivation and Growth,
 - Price Trends, and Historic Returns
- Investor Information on ILS
 - Remodeling and Scenarios/Event Sets
 - Risk and Exposures in the Index Portfolio
 - Benefits, and Problems, with Progress
- Optimizing with the Scenario Sets
 - ILS Portfolio Management subject to a Risk Profile
 - Adding OLWs or Traditional Treaties to the Portfolio
 - Other Applications
- Concluding Remarks



of Actuaries of Austral

RESEARCH CONFERENCE Monday 22 September 2008 Amora Hotel, Sydney



 3

LLC.

e of Actuaries of Australia

RESEARCH CONFERENCE Monday 22 September 2008 Amora Hotel, Sydney



LANE FINANCIAL L.L.C.

RESEARCH CONFERENCE Monday 22 September 2008 Amora Hotel, Sydney



te of Actuaries of Australia

RESEARCH CONFERENCE Monday 22 September 2008 Amora Hotel, Sydney



LANE FINANCIAL L.L.C.

6

RESEARCH CONFERENCE Monday 22 September 2008 Amora Hotel, Sydney



LANE FINANCIAL L.L.C.

RESEARCH CONFERENCE Monday 22 September 2008 Amora Hotel, Sydney



Institute of Actuaries of Australia

LLC

RESEARCH CONFERENCE Monday 22 September 2008 Amora Hotel, Sydney



High Sharpe Ratio



RESEARCH CONFERENCE Monday 22 September 2008 Amora Hotel, Sydney



Leveraged vs. Unleveraged Historical Profiles

LANE FINANCIAL L.L.C.

RESEARCH CONFERENCE Monday 22 September 2008 Amora Hotel, Sydney

OUTLINE Beyond Convergence, towards Integration

- Observations on the ILS Market
 - Motivation and Growth,
 - Price Trends, and Historic Returns
- Investor Information on ILS
 - Remodeling and Scenarios/Event Sets
 - Risk and Exposures in the Index Portfolio
 - Benefits, and Problems, with Progress
- Optimizing with the Scenario Sets
 - ILS Portfolio Management subject to a Risk Profile
 - Adding OLWs or Traditional Treaties to the Portfolio
 - Other Applications





ute of Actuaries of Australi

RESEARCH CONFERENCE Monday 22 September 2008 Amora Hotel, Sydney

| Issue | Mangrove Class B | Valais Re Class C | Residential Re Class 2 | |
|--|---|--|---|-----|
| Sponsor | Homewise Insurance Glacier, Swiss | Flagstone | USAA | |
| Modeler | AIR | RMS | AIR | |
| PFL(%) | 6.62 / 7.62 | 4.50 | 4.32 / 5.08 | |
| EL(%) | 3.70 / 4.30 | 3.52 | 2.85 / 3.32 | |
| PLL(%) | 2.44 / 2.81 | 2.50 | 1.84 / 2.17 | |
| Spread (%) | L+ 13.25 | L+14.50 | L+11.50 | |
| EL Multiple | 3.1 | 4.1 | 3.5 | |
| Coverages (All are occurrence based) | Florida Hurricane | N. American Hurricane, EQ Jap Wind, EQ | Gulf, E. Coast HW Hurricane US EQ | LAP |

12

FINANCIAL L.L.C.

RESEARCH CONFERENCE Monday 22 September 2008 Amora Hotel, Sydney

Questions

- All are indemnity ILS, are all issuers equally good underwriters? Are all equally well aligned with investor interest?
- Is 2% by RMS the exact equivalent of 2% by AIR?
 (Or EQECAT). Ditto PFL, PLL?
- Would a repeat of Andrew (92) exhaust or attach all of the deals to the same extent?
- How do various scenarios accumulate? Amongst each other, and with traditional treaties and ILWs?
- □ What if all deals were evaluated on the same basis?



of Actuaries of Austral



Re-Modeled Scenario Sets

- AIR, RMS and EQECAT all are now offering versions of scenario sets
- In what follows, AIR has provided 10,000 annual scenarios, based on a 35,000+ event set

An Example of Scenario Set Benefits

A Prospective View of the Market Index Portfolio



RESEARCH CONFERENCE Monday 22 September 2008 Amora Hotel, Sydney



LANE FINANCIAL L.L.C.

15

RESEARCH CONFERENCE Monday 22 September 2008 Amora Hotel, Sydney



LANE FINANCIAL L.L.C.

16

RESEARCH CONFERENCE Monday 22 September 2008 Amora Hotel, Sydney



LANE FINANCIAL L.L.C.

17

RESEARCH CONFERENCE Monday 22 September 2008 Amora Hotel, Sydney



FINANCIAL L.L.C.

LANE

RESEARCH CONFERENCE Monday 22 September 2008 Amora Hotel, Sydney



FINANCIAL L.L.C.

RESEARCH CONFERENCE Monday 22 September 2008 Amora Hotel, Sydney



LANE FINANCIAL L.L.C.

of Actuaries of Australia

RESEARCH CONFERENCE Monday 22 September 2008 Amora Hotel, Sydney

Selected Sample Transactions Re-Modeled By AIR.

| DEAL | AJAX | Redwood X Class B | Akibare A | Foundation Re D | Residential Re 2007 Class 3 | Residential Re 2007 Class 5 |
|-----------------------------|----------|----------------------|------------|----------------------------|-----------------------------------|-----------------------------------|
| Principal Perils | US Quake | US Quake | Japan Wind | US Wind US Quake RMS | US Wind US Quake | US Wind US Quake |
| | Lyevai | Lyevai | T(WO | TING | | |
| Q1 Secondary Mkt Yield | 5.48% | 3.18% | 2.62% | 3.55% | 10.75% | 6.47% |
| Re-Modeled EL | 1.96% | 0.65% | 3.59% | 2.44% | 2.49% | 1.03% |
| Stand Alone Risk Statistics | | | | | | |
| Std Dev | 13.69% | 7.67% | 18.43% | 14.85% | 14.02% | 9.76% |
| VaR 99 | 100.00% | 0.00% | 99.56% | 100.00% | 100.00% | 55.22% |
| TVaR 99 | 100.00% | 64.50% | 99.56% | 100.00% | 100.00% | 96.53% |
| | | | | | | |

Data Courtesy of AIR, from Early AIR Model Versions.

Other Benefits – More Risk Measures



of Actuaries of Australia

.

D



Some surprises (perhaps)

- Re-modeled EL's do not always equal original PPM EL's
- □ Not all ILS appear to be re-model-able based on PPM data
- Notwithstanding, it is extremely valuable to have all ILS on the same basis



RESEARCH CONFERENCE Monday 22 September 2008 Amora Hotel, Sydney

Selected Sample Transactions Re-Modeled By AIR.

| DEAL | AJAX | Redwood X Class B | Akibare A | Foundation Re D | Residential Re 2007 Class 3 | Residential Re 2007 Class 5 |
|--|----------------------------------|----------------------|------------------------------------|------------------------------------|-----------------------------------|-----------------------------------|
| Principal Perils | US Quake | US Quake | Japan Wind | US Wind US Quake | US Wind US Quake | US Wind US Quake |
| Original OC Modeler | EqeCat | EqeCat | RMS | RMS | AIR | AIR |
| Issue Spread Q1 Secondary Mkt Yield | 6.25% 5.48% | 3.60% 3.18% | 2.95% 2.62% | 7.25% 3.55% | 12.25% 10.75% | 7.75% 6.47% |
| OC EL Re-Modeled EL AIR Conservatism bps | 1.94% 1.96% <mark>2</mark> | 0.68% 0.65% 3 | 1.04% 3.59% <mark>255</mark> | 1.21% 2.44% <mark>123</mark> | 2.74% 2.49% 25 | 0.77% 1.03% <mark>26</mark> |

Data Courtesy of AIR, from Early AIR Model Versions.



of Actuaries of Australia

RESEARCH CONFERENCE Monday 22 September 2008 Amora Hotel, Sydney

Showing Increasing Capital Requirements for Incremental Amounts of Different Peril ILWs

| CMRe | 08Q1 | | Cal Quake \$20 Billion |
|--|------------------------------------|-----|---------------------------|
| ILW Premium Total Limit or Face Value of ILS Securities | \$12,132,404,584 | + | 6.50% \$250,000,000 |
| Original Portfolio Expected Loss Re-modeled Portfolio Expected Loss | 2.18% 2.33% | | 2.13% 2.33% |
| Standard Deviation | \$599,481,642 | | 2.92% |
| Portfolio TVaR99 | \$3,708,564,018 | | 1.21% |
| ILW Expected Loss | | | 2.41% |
| Expected Return on Capital Standards, Includ Portfolio TVaR99 | ling Premium in the Capi 17.90% | tal | 18.07% |
| Limit | 4.29% | | 4.28% |

Note, all ILWs are added individually in exposure amounts of \$250,000,000. All ILWs have an EL of 2.5% + or - 0.5%

Comparative Statics



of Actuaries of Australia

RESEARCH CONFERENCE Monday 22 September 2008 Amora Hotel, Sydney

Showing Increasing Capital Requirements for Incremental Amounts of Different Peril ILWs

| CMRe | 08Q1 | | US All Natural Perils \$70 Billion |
|--|-----------------------------------|-------|--|
| ILW Premium Total Limit or Face Value of ILS Securities | \$12,132,404,584 | + | 8.50% \$250,000,000 |
| Original Portfolio Expected Loss | 2.18% | | 2.13% |
| Re-modeled Portfolio Expected Loss | 2.33% | | 2.33% |
| Standard Deviation | \$599,481,642 | | 4.29% |
| Portfolio TVaR99 | \$3,708,564,018 | | 5.93% |
| ILW Expected Loss | | | 2.32% |
| Expected Return on Capital Standards, Inclue Portfolio TVaR99 | ding Premium in the Cap 17.90% | oital | 17.25% |
| Limit | 4.29% | | 4.33% |

Note, all ILWs are added individually in exposure amounts of 250,000,000. All ILWs have an EL of 2.5% + or - 0.5%

Comparative Statics



RESEARCH CONFERENCE Monday 22 September 2008 Amora Hotel, Sydney

Showing Increasing Capital Requirements for Incremental Amounts of Different Peril ILWs

| CMRe | 08Q1 | | Japan Quake \$12.5 Billion |
|--|----------------------------------|-------|-------------------------------|
| ILW Premium Total Limit or Face Value of ILS Securities | \$12,132,404,584 | + | 6.50% \$250,000,000 |
| Original Portfolio Expected Loss Re-modeled Portfolio Expected Loss | 2.18% 2.33% | | 2.13% 2.33% |
| Standard Deviation | \$599,481,642 | | 1.15% |
| Portfolio TVaR99 | \$3,708,564,018 | | 0.20% |
| ILW Expected Loss | | | 2.37% |
| Expected Return on Capital Standards, Inclue Portfolio TVaR99 | ding Premium in the Ca 17.90% | pital | 18.31% |
| Limit | 4.29% | | 4.28% |
| | | | 6 a = a/ |

Note, all ILWs are added individually in exposure amounts of \$250,000,000. All ILWs have an EL of 2.5% + or - 0.5%

Comparative Statics



of Actuaries of Australia

RESEARCH CONFERENCE Monday 22 September 2008 Amora Hotel, Sydney

OUTLINE Beyond Convergence, towards Integration

- Observations on the ILS Market
 - Motivation and Growth,
 - Price Trends, and Historic Returns
 - Investor Information on ILS

- Remodeling and Scenarios/Event Sets
- Risk and Exposures in the Index Portfolio
- Benefits, and Problems, with Progress
- Optimizing with the Scenario Sets
 - ILS Portfolio Management subject to a Risk Profile
 - Adding OLWs or Traditional Treaties to the Portfolio
 - Other Applications



ute of Actuaries of Australi



ReA/L RisKontroller[™]

Combining ReA/L RisKontroller and the AIR Worldwide Catastrophe Scenario Set to Optimize ILS Portfolios

ReAL¹ RisKontroller Optimizer – joint venture of Lane Financial LLC and RisKontroll Group GhmB

Maximize expected return of 10,000 year scenario set

Choose among all outstanding ILS

Allow writing or ceding of OLWs

Scenario set available for ILS and OLWs or Traditional Treaties

Construct a portfolio such that it satisfies a multi-layered set of CVaR (a.k.a. TVaR) or VaR constraints



RESEARCH CONFERENCE Monday 22 September 2008 Amora Hotel, Sydney

- Comment AIR Worldwide or any re-modeler may have less information on those ILS that it did not originally model (Ditto RMS or Eqecat).
- Re-modelers therefore tend to be more conservative in their loss estimates on remodeled deals (i.e. higher than PPM provided expected losses) but not always so.
- ReA/L RisKontroller can be used with scenario sets from RMS or Eqecat, or with a custom designed or combination of scenario sets.



of Actuaries of Austral



Sample Problem

Maximize Expected Return on Capital (over the 10,000 year scenario set)

Subject to,

- a) for the worst 4% of scenarios (400), the expected loss should not exceed 10% (i.e. 96% TVAR <= 10% Loss)
- b) for the worst 1% of scenarios (100), the expected loss should not exceed 20% (i.e. 99% TVaR <= 20% loss)
- c) for the worst 0.1% of scenarios (10), the expected loss should not exceed 40% (i.e. 99.9% TVaR <= 40% loss)
- d) Limits on purchasing and selling activity of ILS, writing or retroceding of ILWs
- e) Financing restrictions if any.



RESEARCH CONFERENCE Monday 22 September 2008 Amora Hotel, Sydney

The Opportunity Set

| | DEAL | Size | Spread | 1kt Premiur | % of Premium | | |
|----------|-----------------------------|--------------------|----------|-------------|--------------|--------|-----------------|
| 1 | Aiolos | \$146.17 | 0.0475 | \$6,94 | \$0.69 | | |
| 2 | AJAX | \$100.00 | 0.0625 | \$6.25 | \$0.63 | | |
| 3 | Akibare A | \$90.00 | 0.0295 | \$2.66 | \$0.27 | remiu | r% of Premium |
| 4 | Akibare B | \$30.00 | 0.0315 | \$0.95 | \$0.09 | .94 | \$0.69 |
| 5 | Australis | \$100.00 | 0.04 | \$4.00 | \$0.40 | .25 | \$0.63 |
| 6 | Blue Fin Ltd A | \$205.97 | 0.0455 | \$9.37 | \$0.94 | .66 | \$0.27 |
| 7 | Blue Fin Ltd B | \$86.38 | 0.04 | \$3.46 | \$0.35 | .95 | \$0.09 |
| 8 | Calabash A-1 | \$100.00 | 0.085 | \$8.50 | \$0.85 | .00 | \$0.40 |
| 9 | Calabash Re II A-1 | \$100.00 | 0.084 | \$8.40 | \$0.84 | .37 | \$0.94 |
| 10 | Calabash Re II D-1 | \$50.00 | 0.096 | \$4.80 | \$0.48 | .46 | \$0.35 |
| 11 | Calabash Re II E-1 | \$100.00 | 0.109 | \$10.90 | \$1.09 | .50 | \$0.85 |
| 12 | Carillon 1 A-1 | \$51.00 | 0.1 | \$5.10 | \$0.51 | .40 | \$0.84 |
| 13 | Carillon 2 | \$150.00 | 0.1525 | \$22.88 | \$2.29 | .80 | \$0.48 |
| 14 | Cascadia | \$300.00 | 0.03125 | \$9.38 | \$0.94 | 0.90 | \$1.09 |
| 15 | Cascadia II | \$300.00 | 0.04 | \$12.00 | \$1.20 | .10 | \$0.51 |
| 16 | CAT-Mex A | \$150.00 | 0.0235 | \$3.53 | \$0.35 | 2.88 | \$2.29 |
| 17 | CAT-Mex B | \$10.00 | 0.023 | \$0.23 | \$0.02 | .38 | \$0.94 |
| 18 | Champlain A | \$75.00 | 0.1275 | \$9.56 | \$0.96 | 2.00 | \$1.20 |
| 19 | Champlain B | \$15.00 | 0.135 | \$2.03 | \$0.20 | .53 | \$0.35 |
| 20 | East Lane Re A | \$135.00 | 0.06 | \$8.10 | \$0.81 | .23 | \$0.02 |
| 21 | East Lane Re B | \$115.00 | 0.07 | \$8.05 | \$0.81 | .56 | \$0.96 |
| 22 | Eurus | \$150.00 | 0.0625 | \$9.38 | \$0.94 | .03 | \$0.20 |
| 23 | Fhu-Jin B | \$200.00 | 0.039 | \$7.80 | \$0.78 | .10 | |
| 24 | Foundation Re A | \$180.00 | 0.041 | \$7.38 | \$0.74 | .05 | |
| 25 | Foundation Re D | \$105.00 | 0.0725 | \$7.61 | \$0.76 | .36 | |
| 26 | Foundation Re II A | \$180.00 | 0.0675 | \$12.15 | \$1.22 | .80 | |
| 27 | Foundation Re II G | \$67.50 | 0.098 | \$6.62 | \$0.66 | .30 | 90.74 \$0.76 |
| 28 | Fusion A | \$30.00 | 0.08 | \$2.40 | \$0.24 | .01 | 90.70 61.00 |
| 29 | Fusion B | \$80.00 | 0.06 | \$4.80 | \$0.48 | 2.15 | 91.22 |
| 30 | Fusion C | \$30.00 | 0.03 | \$0.90 | \$0.09 | .02 | 90.00 60.24 |
| 31 | GI Capital | \$125.00 | 0.0315 | \$3.94 | \$0.39 | .40 | 50.24 |
| 32 | Green Valley Ltd | \$265.77 | 0.036 | \$9.57 | \$0.96 | .00 | 50.40 |
| 33 | Lakeside | \$190.00 | 0.065 | \$12.35 | \$1.24 | .90 | \$0.09 |
| 34 | Longpoint Re | \$500.00 | 0.0525 | \$26.25 | \$2.63 | .94 | \$0.39 |
| 35 | MedQuake A | \$50.00 | 0.0355 | \$1.78 | \$0.18 | .57 | 50.96 |
| 36 | MedQuake B | \$50.00 | 0.051 | \$2.55 | \$0.26 | 2.35 | \$1.24 |
| 37 | Merna Re A | \$256.00 | 0.0065 | \$1.66 | \$0.17 | 7.25 | ⇒2.03 €0.19 |
| 38 | Merna Re B | \$647.60 | 0.0175 | \$11.33 | \$1.13 | ./0 | 50.10 |
| 39 | Merna Re C | \$155.00 | 0.0275 | \$4.26 | \$0.43 | .00 | 50.20 |
| 40 | MIDORI | \$260.00 | 0.0275 | \$7.15 | \$0.72 | .00 | 50.17 |
| 41 | Mystic Re A-1 | \$200.00 | 0.07 | \$14.00 | \$1.40 | 1.33 | \$1.13 |
| 42 | Mystic Re A-2 | \$200.00 | 0.065 | \$12.60 | \$1.26 | 16 | \$0.43 |
| 43 | Mystic Re B-1 | \$125.00 | 0.09 | \$11.25 | \$1.13 | 1.00 | \$1.40 |
| 44 | Mystic Re II | \$150.00 | 0.1 | \$15.00 | \$1.50 | 2.60 | \$1.40 |
| 45 | Newton Re A | \$87.50 | 0.0465 | \$4.07 | \$0.41 | 1.25 | \$1.20 |
| 46 | Newton Re B | \$137.50 | 0.0695 | \$9.56 | \$0.96 | 5.00 | \$1.13 |
| 47 | Phoenix Quake | \$192.50 | 0.0245 | \$4.7Z | 50.47 | 07 | \$0.41 |
| 40 | Phoenix Quake Wind | \$192.50 | 0.0245 | \$4.7Z | 50.47 | 56 | \$0.96 |
| 49 | Pridem A | \$05.00 | 0.035 | \$2.90 | 50.30 | 72 | \$0.47 |
| 50 | Pylon A Dular B | 593.02 | 0.015 | \$1.40 | 50.14 | 72 | \$0.47 |
| 52 | Podwood Capital VII | \$153.40 | 0.0535 | \$9.22 | \$0.02 | 98 | \$0.30 |
| 52 | Redwood Capital VIII | \$65.00 | 0.0525 | \$3.40 | \$0.34 | .40 | \$0.14 |
| 53 | Redwood Capital VIII | \$65.00 | 0.0525 | \$3.41 | 50.34 | 22 | \$0.62 |
| 54 | Redwood IX Class A | \$125.00 | 0.0675 | \$8.44 | \$0.84 | .40 | \$0.84 |
| 50 | Redwood IX Class D | \$18.00 | 0.0075 | \$0.44 | \$0.04 | .41 | \$0.34 |
| 57 | Redwood IX Class D | \$20.00 | 0.0775 | \$1.55 | \$0.16 | .81 | \$0.78 |
| 10 | Redwood IX Class E | \$12.00 | 0.145 | \$1.55 | \$0.10 | .44 | \$0.84 |
| 03 | Redwood X Class A | \$25.00 | 0.019 | \$0.48 | \$0.05 | .43 | \$0.04 |
| 60 | Redwood X Class B | \$227.70 | 0.036 | \$8.20 | \$0.82 | .55 | \$0.16 |
| 61 | Redwood X Class C | \$50.20 | 0.0475 | \$2.38 | \$0.24 | .74 | \$0.17 |
| 63 | Redwood X Class D | \$130.50 | 0.0465 | \$6.07 | \$0.61 | .48 | \$0.05 |
| 63 | Redwood X Class E | \$45.20 | 0.0925 | \$4 18 | \$0.42 | 30.20 | \$0.82 |
| 64 | Redwood X Class F | \$20.00 | 0 1325 | \$2.65 | 0.0475 | \$2.38 | \$0.24 |
| 65 | Residential Re 2005 A | \$91.00 | 0.0545 | 0 | 0.0465 | \$6.07 | \$0.61 |
| aa 33 | Residential Re 2005 B | \$85.00 | 0.0845 - | | 0.0925 | \$4.18 | \$0.42 |
| 67 | Residential Re 2006 A | \$47.50 | 0.1-0.00 | | 0.1325 | \$2.65 | |
| 68 | Residential Re 2006 C | \$75.00 | \$91.00 | | 0.0545 | | |
| 69 | Residential Re 2007 Class 1 | \$145.00 | \$85.00 | | 0.0845 🦯 | | |
| 70 | Residential Re 2007 Class 2 | \$125.00 | \$47.50 | | 0,1 | | |
| 71 | Residential Re 2007 Class 3 | \$75.00 | \$75.00 | | 8 | | |
| 72 | Residential Re 2007 Class 4 | \$155.00 | \$145.00 | | | | |
| 73 | Residential Re 2007 Class 5 | \$100.00 Tass 2 | \$125.00 | / | | | |
| (4 | Shackleton Re Class A | \$125 Class 3 | \$75.00 | | | | |
| 25 | Spinnaker Sr 1 | 52007 Class 4 | \$155.00 | | | | |
| | maker Sr 2 | al Re 2007 Class 5 | \$100.00 | | | | |
| | 2 | ckleton Re Class A | \$125 | | | | |
| | Spir | nnaker Sr 1 | g. | | | | |
| | | naker Sr 2 | | | | | |
| | | | - | | | | |

LANE FINANCIAL L.L.C.

RESEARCH CONFERENCE Monday 22 September 2008 Amora Hotel, Sydney



LANE FINANCIAL L.L.C.

32

RESEARCH CONFERENCE Monday 22 September 2008 Amora Hotel, Sydney



LANE FINANCIAL L.L.C.

33

RESEARCH CONFERENCE Monday 22 September 2008 Amora Hotel, Sydney



(Some optimization restrictions are lifted for graphical effect)

LLC.

FINANCIAL

LANE

RESEARCH CONFERENCE Monday 22 September 2008 Amora Hotel, Sydney



A Specific Example

Institute of Actuaries of Australia



LAN

RESEARCH CONFERENCE Monday 22 September 2008 Amora Hotel, Sydney

| | BASE CASE | CASE II | CASE III | CASE IV |
|--|--|--|--|---|
| Comparison of Four Optimizing Solutions | 1% of every ILS | Double Initial Holdings and/or sell initial Holdings | Double Initial Holdings and/or Short 1% | Double initial Holdings and/or short 1%, and/or Write ILWs |
| Expected Ending Income | Statement (Mill | ions \$US) | | |
| Written Premium Ceded Premium Net written Premium Investment Income | \$4.62 \$0.00 \$4.62 \$0.00 \$4.62 | \$6.48 \$0.00 \$6.48 \$0.00 \$6.48 | \$7.13 <u>-\$0.75</u> \$6.38 \$0.00 \$6.38 | \$8.96 -\$0.86 \$8.09 \$0.00 \$8.09 |
| Expenses Expected Losses Expected Recoveries Expected Net Losses Brokerage & Acquisition expense General & Administrative | -\$1.18 \$0.00 -\$1.18 \$0.00 \$0.00 | -\$1.50 \$0.00 -\$1.50 \$0.00 \$0.00 | -\$1.65 \$0.64 -\$1.01 \$0.00 \$0.00 | -\$2.19 \$0.67 -\$1.52 \$0.00 \$0.00 |
| Expected Profit | \$3.44 | \$4.98 | \$5.37 | \$6.58 |
| Expected Rate on Equity | 3.44% | 4.98% | 5.37% | 6.58% |



RESEARCH CONFERENCE Monday 22 September 2008 Amora Hotel, Sydney

| | BASE CASE | CASE II | CASE III | CASE IV |
|--|-----------------|--|---|---|
| Comparison of Four Optimizing Solutions | 1% of every ILS | Double Initial Holdings and/or sell initial Holdings | Double Initial Holdings and/or Short 1% | Double initial Holdings and/or short 1%, and/or Write ILWs |
| Exposure Report | | | | |
| Total Net Exposure | 40.44 | 45.26 | 48.23 | 51.90 |
| Net Premium to Net Cover | 11.42% | 14.32% | 13.22% | 15.59% |
| Leverage: Exposure/Capital | 40.44% | 45.26% | 48.23% | 51.90% |
| Underwriting Report | | | | |
| Premiums Written | 4.62 | 6.48 | 7.13 | 8.96 |
| Premiums Ceded | 0.00 | 0.00 | -0.75 | -0.86 |
| Expected Losses | -1.18 | -1.50 | -1.65 | -2.19 |
| Expected Recoveries | 0.00 | 0.00 | 0.64 | 0.67 |
| Expected Underwriting Profit | 3.44 | 4.98 | 5.37 | 6.58 |
| Portfolio Loss Ratios | | | | |
| Net Written Premiums | 4.62 | 6.48 | 6.38 | 8.09 |
| Expected Net Losses | 1.18 | 1.50 | 1.01 | 1.52 |
| Expected Net Loss Ratio | 25.59% | 23.21% | 15.81% | 18.74% |



of Actuaries of Australia

RESEARCH CONFERENCE Monday 22 September 2008 Amora Hotel, Sydney

| Details of Solutions in | Base Case 1% of every ILS | | Double Initial Holdings and/or sell Initial Holdings | | Double Initial Holdings and/or Short 1% | | Double Initial Holdings and/or short 1%, and/or Write ILWs | | |
|---------------------------|------------------------------|---------|--|---------|---|---|---|-------------------------|---------|
| Four Optimization Runs | | | | | | | | | |
| | Written | Ceded | Written | Ceded | Written | Ceded | Written | Ceded | |
| | Premium | Premium | Premium | Premium | Premium | Premium | Premium | Premium | |
| | (Mil) | (Mil) | (Mil) | (Mil) | (Mil) | (Mil) | (Mil) | (Mil) | |
| Aiolos | \$0.0886 | | \$0.0886 | | \$0.0886 | | \$0.0886 | | |
| AJAX | \$0.0548 | | | | \$0.0234 | | | | |
| Akibare A | | | | | | \$0.0235 | | \$0.0235 | |
| Akibare B | | | | | | \$0.0082 | | \$0.0082 | |
| Australis | \$0.0294 | | \$0.0588 | | \$0.0588 | | \$0.0588 | | |
| Blue Fin Ltd A | | | | | | \$0.1176 | | \$0.1176 | |
| Blue Fin Ltd B | | | | | | \$0.0295 | | \$0.0295 | |
| Calabash A-1 | \$0.0590 | | | | | | | \$0.0571 | |
| Calabash Re II A-1 | \$0.0681 | | \$0.1362 | | \$0.1362 | | \$0.1362 | | |
| Calabash Re II D-1 | \$0.0279 | | \$0.0557 | | \$0.0557 | | \$0.0557 | | |
| Calabash Re II E-1 | \$0.0881 | | \$0.0000 | | \$0.1762 | | \$0.1012 | | |
| Carillon 1 A-1 | \$0.0464 | | \$0.0928 | | \$0.0928 | | \$0.0928 | | |
| Carillon 2 | \$0.2052 | | \$0.4104 | | \$0.4104 | | \$0.4104 | | |
| Cascadia | \$0.0876 | | \$0.1510 | | \$0.1752 | | \$0.1752 | | |
| Cascadia II | \$0.0918 | | \$0.1836 | | \$0.1836 | | \$0.1836 | | |
| CAT-Mex A | \$0.0510 | | \$0.1020 | | \$0.1020 | | \$0.1020 | | |
| CAT-Mex B | \$0.0032 | | \$0.0063 | | \$0.0063 | | \$0.0063 | | |
| Champlain A | \$0.0769 | | \$0.0163 | | | | \$0.0641 | | |
| Champlain B | \$0.0203 | | \$0.0405 | | \$0.0405 | | \$0.0405 | | |
| East Lane Re A | \$0.0740 | | \$0.0901 | | \$0.1480 | | \$0.1480 | | |
| East Lane Re B | \$0.0731 | | \$0.1462 | | \$0.1462 | | \$0.1462 | | |
| East Lane II A | \$0.0467 | | | | \$0.0240 | | \$0.0933 | | |
| East Lane II B | \$0.0505 | | \$0.1011 | | \$0.1011 | A A B A B A B A B A B A B A B A | \$0.1011 | A A AAA | |
| East Lane II C | \$0.0795 | | AA 4 4 A 4 | | AA A A A A | \$0.0795 | AA 4 4 A 4 | \$0.0795 | |
| Eurus | \$0.0592 | | \$0.1184 | | \$0.1184 | | \$0.1184 | | / |
| Fhu-Jin B | \$0.0595 | | \$0.1190 | | \$0.1190 | * • • • - - | \$0.1190 | AA (AA) | ∣ —/ \/ |
| Foundation Re A | \$0.1291 | | | | | \$0.0477 | | \$0.1291 | LANE |

FINANCIAL L.L.C.

RESEARCH CONFERENCE Monday 22 September 2008 Amora Hotel, Sydney

| Details of Solutions in Four Optimization | Base 1% of e | Case very ILS | Double Holdings : Initial H | Double Initial Double Initial Double Initial Double Initial Holdings and/or sell Initial Holdings Short 1% | | e Initial s and/or t 1% | Double Initial Holdings and/o short 1%, and/c Write ILWs | |
|--|--|---------------------------|--|--|--|-------------------------------|---|---------------------------|
| Kuns | Written Premium (Mil) | Ceded Premium (Mil) | Written Premium (Mil) | Ceded Premium (Mil) | Written Premium (Mil) | Ceded Premium (Mil) | Written Premium (Mil) | Ceded Premium (Mil) |
| Successor Japan Quake Class A Successor Japan Quake Class B Successor Japan Quake Class C Successor Euro Wind Class A-I Successor Euro Wind Class A-III Successor Euro Wind Class A-III Successor I Class B-II Successor I Class B-II Successor II Class C-III Successor II Class E-III Willow Re ILW California Quake 10B ILW California Quake 10B ILW California Quake 12.5B ILW California Quake 20B ILW California Quake 5B ILW California Quake 50B ILW Florida Wind 10B ILW Florida Wind 10B ILW Florida Wind 12.5B ILW Florida Wind 20B ILW Florida Wind 20B ILW Florida Wind 20B ILW Florida Wind 50B ILW Florida Wind 50B ILW Florida Wind 50B ILW Florida Wind 60B ILW Florida Wind 60B ILW Florida Wind 70B | \$0.0105 \$0.0498 \$0.0175 \$0.0308 \$0.0080 \$0.0708 \$0.0249 \$0.1248 \$0.1035 | | \$0.0209 \$0.0996 \$0.0010 \$0.0616 \$0.0160 \$0.1416 \$0.2497 | | \$0.0209 \$0.0996 \$0.0350 \$0.0616 \$0.0160 \$0.1416 \$0.2497 | \$0.0682 | \$0.0209 \$0.0996 \$0.0350 \$0.0616 \$0.0160 \$0.1416 \$0.2497 \$0.1100 \$0.9500 \$0.9500 \$0.1575 \$0.0350 \$0.0275 \$0.02275 \$0.1950 \$0.1750 \$0.1450 \$0.1275 | \$0.0363 |

RESEARCH CONFERENCE Monday 22 September 2008 Amora Hotel, Sydney

The Optimal Solution Reports,

- a) The ILS in the optimal portfolio
- b) The set of buy sell transactions to effect the optimum
- c) The rank ordering of the deals to buy (B-T-W) and deals to sell
- d) Marginal prices at which non-optimal deals can be bought or sold
- e) Sets of Risk-adjusted prices
- f) Reports showing risk profile, marginal return on capital
- g) Implied Probabilities
- h) Problematic scenario ranking
- i) Expected Balance sheets, Income Statements
- j) Expected Underwriting and leverage reports



of Actuaries of Austral

RESEARCH CONFERENCE Monday 22 September 2008 Amora Hotel, Sydney

OUTLINE Beyond Convergence, towards Integration

- Observations on the ILS Market
 - Motivation and Growth,
 - Price Trends, and Historic Returns
 - Investor Information on ILS

- Remodeling and Scenarios/Event Sets
- Risk and Exposures in the Index Portfolio
- Benefits, and Problems, with Progress
- Optimizing with the Scenario Sets
 - ILS Portfolio Management subject to a Risk Profile
 - Adding OLWs or Traditional Treaties to the Portfolio
 - Other Applications
- Concluding Remarks



RESEARCH CONFERENCE Monday 22 September 2008 Amora Hotel, Sydney

Implied Probabilities – Worst 2% of scenarios



LANE FINANCIAL L.L.C.

42

RESEARCH CONFERENCE Monday 22 September 2008 Amora Hotel, Sydney

Other Applications of Optimization

Portfolio Selection

- Traditional Reinsurers' Portfolio (including ILS, ILWs)
- Simultaneously Ceding and Pricing Retrocessional cover

Replication strategies

- Best ILWs to represent particular ILS
- Minimizing basis risk

Capital Structure

- Optimal capital structure for Insurance CDO's
- Capital allocation Rules

Insurance

Insurance company allocation of sales efforts



of Actuaries of Australi



END

Contact

mlane@LaneFinancialLLC.com

rbeckwith@LaneFinancialLLC.com

Web site

www.LaneFinancialLLC.com

