Insurance Regulatory Information System (IRIS)

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Agenda

- Overview of IRIS
- Explanation and calculation of IRIS ratios
- IRIS ratio ranges and implications
- Comparison of IRIS with EISA Early Warning Ratios
Overview of IRIS

- Help regulators target resources on more risky companies
- To be supplemented by in-depth financial analysis and/or on-site examinations
- 12 ratios: each with “usual range”
- Falling outside usual range: requires attention
- On the average 11% of companies (US) have 4 or more ratios falling outside the usual range
- Three possible levels of attention
  - Level A: high priority for review
  - Level B: may require review, but not immediate
  - Reviewed: no level
IRIS Ratios

• **There are 12 IRIS ratios**

• **These are grouped into four areas**
  – Overall ratios
  – Profitability ratios
  – Liquidity ratios
  – Reserve ratios
Overall Ratios

- **Ratio 1** – Gross premium written to policyholders’ surplus
- **Ratio 2** – Net premium written to policyholders’ surplus
- **Ratio 3** – Change in net premium written
- **Ratio 4** – Surplus aid to policyholders’ surplus
Profitability Ratios

- **Ratio 5** – Two-year overall operating
- **Ratio 6** – Investment yield
- **Ratio 7** – Change in policyholders’ surplus
Liquidity Ratios

- Ratio 8 - Liabilities to liquid assets
- Ratio 9 - Gross agent’ balance to policyholders’ surplus
Reserve Ratios

- **Ratio 10 - One-year reserve development to policyholders’ surplus**
- **Ratio 11 - Two-year reserve development to policyholders’ surplus**
- **Ratio 12 – Estimated current reserve deficiency to policyholders’ surplus**
Ratio 1 – Gross Premium Written to Policyholders’ Surplus

• **Policyholders’ surplus is surplus and capital of the insurance company**
  – It is comparable to the total equity of a company

• **Gross and net premium written: measures of the sales of the insurance company**

• **Ratios: measures of asset turnover**
  – Reflects on management effectiveness in using the capital
  – Also reflects on the risk management is willing to take
Calculation of Ratio 1

- **A = Direct Premiums Written**
- **B = Reinsurance (Indirect) Premium – Affiliate**
- **C = Reinsurance (Indirect) Premium – Non-affiliate**
- **D = Capital and Surplus**
- **E = Gross Premium = A+B+C**
- **F = Gross Premium to Policyholders’ Surplus = 100 (E/D)**
Ratio 2 – Net Premium Written to Policyholders’ Surplus

• **Net premium written** = gross premium written – reinsurance ceded

• **Ratio 2 also reflects on management’s willingness to leverage its equity (capital) for sales**

• **It is important that Ratio 1 does not exceed Ratio 2 by a wide margin**
  – This would indicate that much of the policyholders’ surplus comes from reinsurance

**Calculation:** 100 \((A/B)\), where:

- **A** = Net premiums written
- **B** = Policyholders’ Surplus
Ratio 3 – Change in Net Premium Written Calculation of Ratio 2

- The change is expressed as a percentage of net premium written in the prior year
- It is a measure of sales variability
- For an insurance company, there is usually a deficit in the first few years of sale of introducing and marketing products
- Such deficits must be covered by surplus of the company
- Too much (rapid) increase in sales will cause severe surplus strain to the company
- Calculation: 100 (A-B)/B, where:
  - A = Net Premium, Current Year
  - B = Net Premium, Previous Year
Ratio 4 – Surplus Aid to Policyholders’ Surplus

- **Surplus aid is an estimate of commissions on unearned ceded reinsurance premiums**
- **This should belong to the reinsurer**
  - By treaty, it may be retained by primary insurer
- **If a large portion of policyholders’ surplus depend on surplus aid**
  - Continued solvency of primary insurer depends on the continued co-operation of the reinsurer

**Calculation:** \(100 \times \frac{E}{D}\) where:
- \(A = \text{Reinsurance Ceded Commission}\)
- \(B = \text{Ceded Premiums Written}\)
- \(C = \text{Total Unearned Ceded Premium}\)
- \(D = \text{Policyholders’ Surplus}\)
- \(E = \text{Surplus Aid} = A \times \frac{C}{B}\)
- \(F = \text{Surplus Aid to Policyholders’ Surplus} = 100 \times \frac{E}{D}\)
Ratio 5 - Two-Year Overall Operating

- *This is a measure of the profitability of the insurer on a longer term basis: over two years*

- **Negative profit % = loss ratio + expense ratio - investment return ratio**

- **Loss ratio = (losses + expenses + dividends paid) / net premiums earned**

- **Net premiums earned = net premiums written – increase in unearned premium reserve**

- **Expense ratio = underwriting expenses / net premiums written**

- **Investment return ratio = investment income / net premiums earned**
Calculation of Ratio 5

- **A** = Losses and LAE Incurred; **B** = Prior Year’s
- **C** = Dividend Paid to Policyholders; **D** = Prior Year’s
- **E** = Premium Earned; **F** = Prior Year’s
- **G** = Other Underwriting Expense; **H** = Prior Year’s
- **I** = Total Other Income; **J** = Prior Year’s
- **K** = Net Premium Written; **L** = Prior Year’s
- **M** = Net Investment Income; **N** = Prior Year’s
- **O** = Loss Ratio = 100 \(\frac{(A+B+C)}{(E+F)}\)
- **P** = Expense Ratio = 100 \(\frac{(G+H+I+J)}{(K+L)}\)
- **Q** = Investment Ratio = 100 \(\frac{(M+N)}{(E+F)}\)
- **Ratio 5, Overall 2 year operating ratio** = **O**+**P**+**Q**
Ratio 6 – Investment Yield

- *Investment yield is a major component of income for an insurance company*
- *It also indicates the general quality of company’s investment portfolio*
- *It is the ratio of net investment income to average cash and invested assets for the current and the prior years*
Calculation of Ratio 6

- \( A = \text{Cash and Invested Assets}; B = \text{Prior Year's} \)
- \( C = \text{Interest, dividend, real estate income, due and accrued}; \)
  \( D = \text{Prior Year's} \)
- \( E = \text{Borrowed Money}; F = \text{Prior Year's} \)
- \( G = \text{Interest on Borrowed Money}; H = \text{Prior Year's} \)
- \( I = \text{Net Investment Income} \)
- \( J = \text{Investment Yield} = 100 \frac{I}{(A+B+C+D-E-F-G-H)/2} \)
Ratio 7 – Change in Policyholders’ Surplus

- This is the ultimate measure of financial condition of the company
- A negative change shows deterioration: bad
- Drastic increase shows instability
  - It is sometimes related to a change of ownership
  - Many insolvent companies have high surplus increases prior to insolvency of the company
Calculation of Ratio 7

Change in Policyholder’s Surplus

• $A = \text{Total underwriting expense incurred}$; $G = \text{Prior year’s}$
• $B = \text{Net commission and brokerage expense}$; $H = \text{Prior year’s}$
• $C = \text{Total taxes, licenses and fees}$; $I = \text{Prior year’s}$
• $D = \text{Net premium written}$; $J = \text{Prior year’s}$
• $E = \text{Unearned Premium}$, $K = \text{Prior Year’s}$
• $F = \text{Deferred Acquisition Expense} = [(A+B+C)/2D]xE$
• $L = \text{Deferred Acquisition Expense Prior Year’s} = [(G+H+I)/2J]xK$
• $M = \text{Policyholders’ Surplus}$; $N = \text{Prior Year’s}$
• $O = \text{Change in Policyholders’ Surplus} = 100 \frac{(F+M-L-N)}{(L+N)}$
Ratio 8 – Liability to Liquid Assets

- **Liquid assets for IRIS includes R.E. up to 5% of total liability**
  - It also includes mortgages
- **This is different from the treatment in FAST**
- **This is a measure of the company’s ability to meet the financial demands using liquid assets**
- **This is different from financial analysis of industrial companies**
  - Current ratio = current assets / current liabilities
  - Current means less than 1 year
Calculation of Ratio 8

- \( A = \text{Total liabilities} \)
- \( B = \text{Real estate, property occupied by company} \)
- \( C = \text{Real estate, other properties} \)
- \( D = \text{Excess real estate} = (B+C)-(A/20) \)
- \( E = \text{Government Bonds} \)
- \( F = \text{Preferred and Common Stock} \)
- \( G = \text{Mortgage Loans} \)
- \( H = \text{Real estate held for investment} \)
- \( I = \text{Cash and short term investment} \)
- \( J = \text{Other Invested assets} \)
- \( K = \text{Receivables for securities} \)
- \( L = \text{Installment premiums booked but due} \)
- \( M = \text{Interest income accrued} \)
- \( N = \text{Investments in parents, subsidiaries and affiliates} \)
- \( O = \text{Liquid assets} = (E+F+G+H+I+J+K+L+M) - (D+N) \)
- \( P = \text{Liability to liquid assets} = 100 \times (A/O) \)
Ratio 9 – Gross Agents’ Balances to Policyholders’ Surplus

- Agents’ balances are often not easily converted to cash in time of liquidation
- Too much reliance on that may spell liquidity problem
- Calculation = 100 \( (A/B) \), where:
  - \( A \) = Agents’ balances (in course of collection)
  - \( B \) = Policyholders’ surplus
Ratio 10 – One-year Reserve Development To Policyholders’ Surplus

• **Losses outstanding a year prior and up to the current statement date is the sum of**
  – Current reserves for those losses outstanding
  – Loss payments made during last year

• **One-year reserve development is the difference**
  – Updated loss estimate above, minus
  – Reserve at the end of prior year

• **If the above one-year reserve development is**
  – **Positive:** reserves were deficient
  – **Negative:** reserves were redundant

**Calculation:** 100 \( \frac{A}{B} \); where:
- \( A \) = One year reserve development
- \( B \) = Policyholders’ surplus
Ratio 11 – Two-year Reserve Development to Policyholders’ Surplus

• Reserve deficiency and redundancy are very serious matters
  – That is why we study both such ratio on one-year and two-year bases

• This ratio is comparable to Ratio 10 on a two-year basis

• Calculation: 100 (A/B), where:
  – A = 2 year reserve development
  – B = Prior Year, 2 - Policyholders’ surplus
Ratio 12 – Est. Current Reserve Deficiency to Policyholders’ Surplus

- **This is a very important ratio**
  - It measures whether the current reserve is enough to cover expected losses or not
- **Expected losses = net premiums earned x average ratio of loss reserves to premium**
- **This is compared to the stated reserves for the current year**
- **Calculation:** \( = 100 \frac{(E/F)}{; \text{ where:}} \)
  - A = Prior year 2 losses and LAE to Net Premium
  - B = Prior year 1 losses and LAE to Net Premium
  - C = Net Premium earned
  - D = Loss and LAE
  - E = Reserve Deficiency = \( \frac{(A+B)}{200} \times (C-D) \)
  - F = Policyholders’ surplus
## IRIS Summary

### Usual Range

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<th>Ratio</th>
<th>Description</th>
<th>Minimum</th>
<th>Maximum</th>
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<tr>
<td>1</td>
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<td>Change in Net Premiums Written</td>
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<td>Surplus Aid to Policyholders' Surplus</td>
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<td>Estimated Current Reserve Deficiency to Policyholders' Surplus</td>
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IRIS Score

- 1 point is given for every ratio going outside the usual range
- Total score of 4 or more indicates Level A
- Total score of 2 or 3 indicates Level B
Thank You

Exercises & Discussions
Appendix 6

Exit Report of Edgar P Balbin
TAPR II Project – Component B, Insurance
May 29, 2008