

**BACKGROUND READING FOR A COURSE IN EARLY WARNING  
AND SOLVENCY BASED SUPERVISION OF INSURERS**

**MODULE 3**

**PRUDENTIAL OFF SITE MONITORING  
RATIO ANALYSIS**

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## OVERVIEW OF INSURANCE SUPERVISION

1. Historically, there have been two broad approaches to insurer supervision. One, the prescriptive, audit based approach has characterized Civil Code countries and sees a major role for the state in over-viewing and directing the financial sector. This approach, while limiting scope for failure, has also restricted product and distribution innovation and general market development. It also exposes the supervisor to legal liability in some jurisdictions if failure does occur. The other model, largely emerging from the common law tradition has had a largely laissez faire approach, with the supervisor taking a largely hands off approach until an insurer is in clear danger of failing. A series of major insurer failures in common law countries in the last 20 years has led to a more interventionist approach, while still maintaining a market model of competition. The two models are now converging towards what is known as a risk based approach, which acknowledges that supervisory resources are often limited and that supervisory action needs to be focused on those institutions most at risk of failure.
2. The supervision model that will be used for this course is based on the US National Association of Insurance Commissioners (NAIC) approach. This has been designed to deal with 55 different state, district and territorial jurisdictions of widely varying capabilities, resources and market structures and is thus a relatively self contained and global approach, although it allows for supplementary actions at the local level. The NAIC carries out regular certification examinations of state supervisors in an effort to maintain consistent standards across the US.
3. The NAIC model sees three fundamental stages of supervision:
  - a. ‘Conducting off-site monitoring of financial condition using financial statement and market information analysis, and on site examinations;
  - b. implementing corrective action plans for financially weakened companies; and
  - c. undertaking insolvency proceedings’<sup>1</sup>
4. While three basic stages are involved some countries with more centralized regulatory and supervisory approaches have implemented up to 5 distinct and linked supervisory stages, known as the regulatory ladder. This sees increasing action and intervention by the supervisor as an insurance company’s position deteriorates. The approach used in Canada is shown in Annex 1. A number of developing countries have adopted simplified regulatory ladders.
5. **There are two fundamental off site tools that are employed by the supervisor under a modern supervisory model to determine if an insurer needs closer supervision, intervention or enforcement measures. These are early warning indicators and solvency measures.** The early warning indicators tend to drive early intervention by supervisors while the solvency measures drive enforcement actions as

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<sup>1</sup> From a joint report of the national association of Insurance Commissioners and the Federal Reserve System – April, 2005

an insurer approaches the point at which it can no longer meet its obligations to policyholders. This module is largely concerned with the early warning (and intervention) measures, but a short overview of modern solvency concepts is included as the two sets of tools are linked through the regulatory ladder.

#### **EARLY WARNING INDICATORS - OFF SITE RATIO ANALYSIS**

6. The methodology used under the NAIC system for screening insurers and providing early warning is FAST, or Financial Analysis Solvency Tools system. It has three sub components:
  - (i) IRIS, or Insurance Regulatory Information System – this consists of a) a series of ratios extracted from an insurers periodic statutory returns that are available to the public and b) a confidential listing of insurers at risk based on a more detailed analysis of those insurers whose IRIS ratios and other analytical work indicate need further review.
  - (ii) A scoring system that relates IRIS and some other ratios to the likelihood of solvency problems, based on statistical analysis of past experience.
  - (iii) The insurer profile system, which identifies trends (either quarterly or annual) over a 5 year period and highlights unusual fluctuations.
7. Information required to be provided by insurers annually to the supervisor under the NAIC model includes:
  - (i) Full financial reporting information - balance sheet, profit and loss statement, cash flow statement, notes to the accounts and numerous answers to special questions about such matters as investments, investment income, non admitted assets, reinsurance and related party transactions.
  - (ii) Items including documents related to the external audit, the actuary's opinion and the risk based capital report (see below).
8. Quarterly data focuses on short term indicators such as assets and liabilities, profit and loss, changes investments, reinsurance, premiums and claims.
9. Based on many years of experience and statistical analysis the key predictive ratios for US insurers under the IRIS system are currently<sup>2</sup> as follows:

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<sup>2</sup> The components are reviewed annually based on emerging experience.

<b>IRIS Ratio</b>	<b>Maximum Normal Range %</b>	<b>Minimum Normal range %</b>
Gross written premium to statutory capital and surplus. <sup>3</sup>	900	N/A
Net written premium to statutory capital and surplus.	300	N/A
Change in net written premium year to year.	33	-33
Solvency support reinsurance to statutory capital and surplus.	15	N/A
Two year operating ratio.	100	N/A
Investment yield	10.0	4.5
Change in statutory capital and surplus.	50	-10
Liabilities to liquid assets.	105	N/A
Gross amount due from agents divided by statutory capital and surplus.	40	N/A
One year development of claims provisions divided by statutory capital and surplus (i.e development of provisions ignoring the current underwriting year).	20	N/A
Two year development of claims provisions divided by surplus	20	N/A
Deficiency in claims provisions as % capital and surplus	25	N/A

10. Each of these ratios requires detailed accounting explanations, including instructions on the treatment of such items as deferred acquisition costs and valuation of assets. Different countries with different accounting systems will require different rules and possibly even different ratios. The FSA has developed an initial set of ratios for Albania and these are discussed in detail below. The ratios chosen will no doubt change and evolve with experience and as Albania moves towards international, or at least EU, accounting and auditing standards.

<sup>3</sup> Statutory surplus only allows for admitted assets (i.e. assets that can be counted under the insurance regulations). It is usually less than the capital and surplus shown in the published accounts.

11. The accounting numbers used in the early warning ratios should be taken from the financial and statistical returns provided to the insurance supervisor rather than the published accounts of the insurers. In many jurisdictions the accounting numbers required by the insurance supervisor are more conservative than those used for published accounts. This is because the supervisor is concerned with solvency while the published accounts are meant to show best estimate economic results – two different objectives.

#### **ON SITE EXAMINATIONS - BRIEF OVERVIEW<sup>4</sup>**

12. On site examinations supplement and, to some extent derive from, the off site analysis.
13. On site examination can be full scope or limited scope. Full scope examinations can be conducted when an insurer is in serious difficulty, but typically a full scope examination must be carried out at least once every 3 to 5 years for every insurer. Limited scope examinations are carried out when an insurer is identified as having problems by off site analysis and enables the supervisor to concentrate on specific aspects of the insurers operations.
14. A full scope on site examination will involve examination of the following:
  - (i) Accounting methods and procedures, financial statement presentation.
  - (ii) Validating figures provided in the insurer's statutory returns to the insurance supervisor.
  - (iii) Verifying the insurance company's solvency.
  - (iv) Determining whether the insurer has complied with the relevant laws and regulations.
15. This will involve a review of the following (with greater emphasis on areas highlighted by the off site analysis):
  - (a) Company history.
  - (b) Management and control (including special reference to internal control procedures).
  - (c) Record keeping and accounting system integrity.
  - (d) Financial insurance contracts offered.
  - (e) Growth rate and sources of growth.
  - (f) Loss experience – trends and fluctuations - causes
  - (g) Reinsurance strategy and security.

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<sup>4</sup> This is partly based on NAIC source material.

16. In the course of an on site inspection the supervisor is likely to interview company management, the internal and external auditors and the actuary. They may also run tests of internal control systems.

### **SOLVENCY BASED ENFORCEMENT**

17. The NAIC requirements of its minimum solvency requirement are that:
- (i) It is related to risk,
  - (ii) that it raises the safety net for insurers
  - (iii) that it is consistent in application,
  - (iv) that it provides a legal basis for the supervisor to take enforcement action when an insurer's actual capital and surplus falls below the statutory level.
18. Solvency measures in industrial countries consider a wide range of risks that can affect an insurer's financial strength. For this reason the solvency measure is often called risk based capital, or RBC. Items taken into account in determining risk based capital for non life insurers in the US include:
- (a) C1 style risk – asset market and credit risk
  - (b) C2 style risk – underwriting and pricing risk
  - (c) C3 style risk – asset liability mismatching risk
  - (d) C4 style risk – general business risk
  - (e) Correlations between some of these risks that reduce the required level of capital.
19. Annex 2 shows the average RBC levels required in the US as a result of these calculations and their composition.
20. In practice the so called 'Company Action Level RBC is calculated for these risks and divided by 2 to produce the 'Authorized Control Level RBC'. The actual capital and surplus is then divided by this latter figure and regulatory action depends on the ratio that emerges as follows:
- (i) If the ratio exceeds 200% no enforcement action is required.
  - (ii) If the ratio is less than 200% the company needs to produce a plan for recapitalization.
  - (iii) If the ratio is between 70% and 100% the supervisor may take control of the insurer at his or her discretion.
  - (iv) If the ratio is under 70% the insurer has to be taken under administration by the supervisor - this is similar to breaching the 30% guarantee fund level under the EU regime, but starting point solvency tends to be inadequate under the current EU

Solvency I regime. A new Solvency II regime, based on risk based capital principles, is currently being developed by the EC.

21. Albania is likely to move towards such a solvency based enforcement regime, but with risk based measures suited to the stage of development of the insurance and capital markets.

#### **RATIO ANALYSIS IN ALBANIA**

22. The following 12 ratios have been identified as the initial IRIS set for non life insurance in Albania:

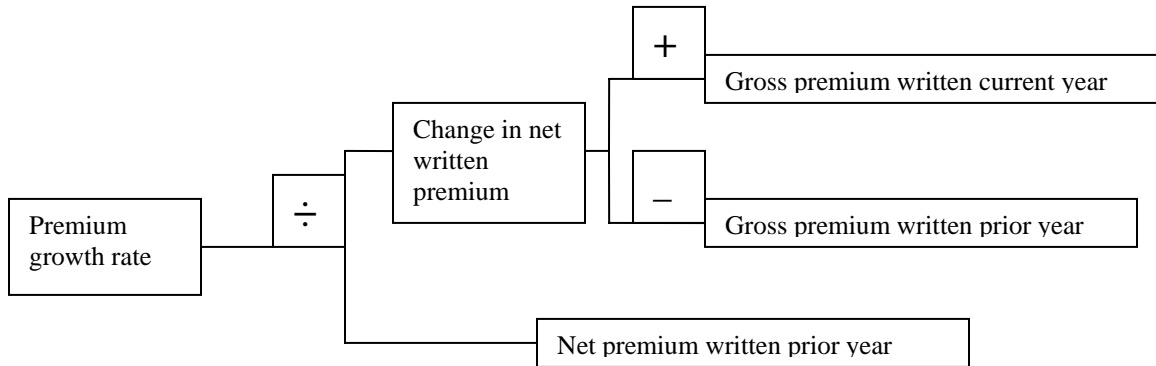
- (i) Premium growth rate
- (ii) Net retention
- (iii) Net claims (or loss) ratio
- (iv) Expense ratio
- (v) Combined ratio
- (vi) Investment income ratio
- (vii) Other income ratio
- (viii) Operating ratio
- (ix) Profit ratio
- (x) Capital and surplus to gross premium
- (xi) Capital to technical provisions
- (xii) Solvency coverage

23. These are discussed individually below. At this stage there is insufficient historical experience under modern accounting standards in the Albanian insurance sector to produce single indicative scores or a profile based on these ratios. However as time passes these can be introduced. In the interim the ratios, and those relating to solvency in particular, can be used to determine which insurers need closer supervisory attention.



**(i) PREMIUM GROWTH**

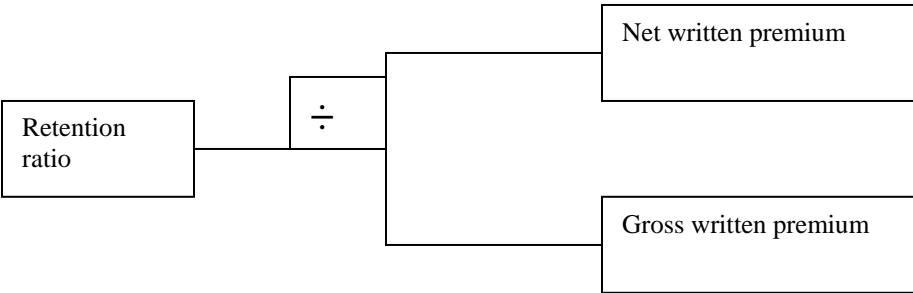
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24. This ratio is important because it can indicate a number of symptoms of potential stress (although to determine if they are valid more in depth analysis and possibly on site inspection is usually required) –
- (i) Sudden entry into new lines of business
  - (ii) An attempt to increase cash flows to meet claims payments
  - (iii) Loss of business
  - (iv) Exit from certain classes of business
25. Given the immaturity and small size of the Albanian insurance sector greater fluctuations would be expected than in a more developed market. A possible range would be plus 40% to minus 40%.
26. Supplementary information to examine if the ratio falls near or outside these extremes include any changes in marketing strategy, pricing policy distribution strategy, liquidity position and adequacy of provisions.
27. Other ratios to examine if this ratio is high include net retention, profit ratio, capital to GWP and solvency coverage. If these are stable then there is less to be concerned about.

***(ii)* NET RETENTION**

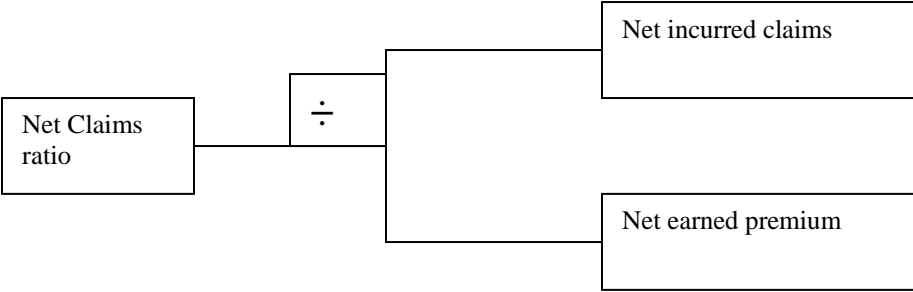
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- 28. This ratio varies considerably according to the level of risk relative to the capital and surplus supporting an insurer. A retention ratio of less than 20% often indicates that the insurer is closer to being a broker than a real underwriter, but may find exchange commission more remunerative than brokerage. However such arrangements also allow reinsurers to become direct writers in developing markets and possibly to foster the steady development of professional local insurers. Very high retention ratios when large risks are being written can be sign of an attempt to increase cash flows to cover claims, of a deteriorating relationship with reinsurers or of an ability to attract reinsurance at all – a red flag.
- 29. In developing countries one would typically expect to see retention ratios of between 40% and 80%, depending on the classes of business written and the local liability laws.
- 30. A sudden change in retention ratio is a strong red flag and needs to be investigated quickly.
- 31. In addition the regulations should specify that only insurers of a certain security should be providing most of the reinsurance of a local direct insurer. For very small insurers this can be a problem because they do not offer enough premium to attract reinsurance brokers or reinsurers themselves. In this situation a local reinsurance pool can sometimes be justified.

***(iii)* NET CLAIMS RATIO**

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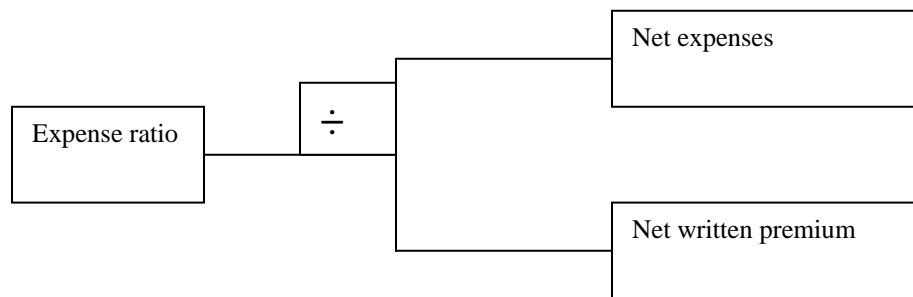
- 32. This ratio is very dependent on the class of business written and the regulatory approach to long tail provisions (discounted or not discounted). For short tail classes

like motor property damage or fire the ratio would typically be between 65% and 80% in a well functioning competitive market. Because the provisions are only held for a short time before the claim is paid there is limited scope to earn investment income so the premium needs to cover the claims costs and expenses. All of the investment income is needed to provide an adequate profit level. For long tail classes there may be scope for higher claims ratios but this needs to be monitored very closely.

33. In developing markets expense rates tend to be higher (see background reading) and there is less room in the premium to cover claims. This means that lower claims ratios may be justified for a while, but claims ratios of less than 50% point to a market that is not working properly or to inadequate claims provisioning.
34. Sudden changes in claims ratios are a red flag and can point to such things as inadequate or poor reinsurance, changes in business strategy or changes in the approach to provisioning.
35. No insurer can sustain excessive claims ratios indefinitely. However the claims ratios need to be reasonably high if the market is working properly for its customers.

***(iv)* EXPENSE RATIO**

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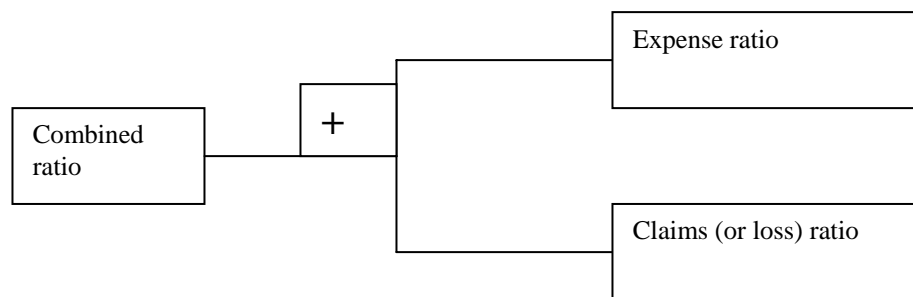


36. Net expenses are equal to gross expenses less exchange commission paid by reinsurers under proportional treaties. Exchange commission is intended to help an insurer to defray business acquisition costs.
37. The net expense ratio is a measure of how efficient an insurer is. It can also point to funds being tunneled out of the insurer to related persons or organizations or to misuse of funds.
38. As noted above the premium received must be sufficient to pay expenses and claims, as investment income is normally required to provide an adequate profit. If the expense rate is too high the insurer will eventually find that it cannot compete for market share against more efficient operators.

39. If an insurer that has been using proportional insurance heavily suddenly has a change in expense rate this could point to a change in the terms that the insurer is prepared to offer to the insured.
40. There are some economies of scale in non life insurance, although these tend to disappear once an insurer gets too big and complex. Thus an insurance industry with a high average expense rate is likely to see some merger activity. In addition once foreign insurers enter a market they can take advantage of cross border efficiencies and small inefficient local insurers will find it hard to survive.

#### **(v) COMBINED RATIO**

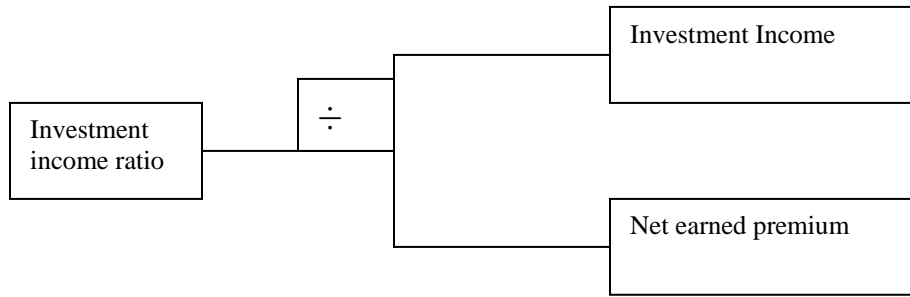
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41. The combined ratio is the sum of the expense ratio and the claims ratio. It measures how much of the premium is being used for claims and expenses. If the combined ratio is greater than 100% then the insurer is relying on investment income, and if this is not adequate, on capital and surplus (including reserves) to cover claims and expenses.
42. A combined ratio of a little less than 100% is typically a good sign – a combined ratio greater than 100% could be a red flag, or could simply indicate that the insurer is in an aggressive growth mode. In this case the solvency level needs to be examined to ensure that the insurer can sustain such a strategy.
43. The combined ratio should be one of the basic management information measures used by senior management in an insurance company and any incentive scheme will probably include improvements in this ratio.
44. Trends in the combined ratio can be a helpful guide as to whether an insurance company is in danger of becoming distressed.

**(vi) INVESTMENT INCOME RATIO**

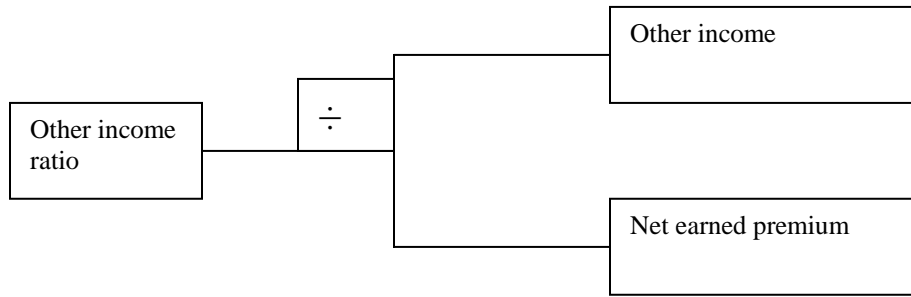
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45. Investment income should be calculated in an accrual basis (that is interest on bonds should be accrued and unrealized capital gains and losses included) to the extent possible and investment related expenses should be deducted from investment income rather than included in general expenses.
46. The investment income ratio is a measure of how effective the insurance company management is in collecting premiums and investing them effectively until claims are paid. If agents and brokers are slow to pay then this means that the assets covering claims and unearned premium provisions will not be income earning as they are merely receivables.
47. In a modern competitive market place the typical investment income ratio should be between 4% and 8%. A ratio of 5% is normally enough to provide an adequate return to capital if the combined ratio is 100%.
48. As noted earlier the investment income earned by an insurance company in a competitive market is the main source of profit – the premiums are required to pay claims and expenses. The better an insurer is at quickly turning premiums into income earning assets the better its profitability and the more quickly it can grow (because it will have a larger capital base).
49. Insurance companies are in the risk underwriting business, not the investment business and the assets covering their claims and unearned premium provisions and minimum solvency requirement should be liquid, secure and maximize current income. Assets in excess of the minimum required solvency level can be invested in longer term assets such as property and, to a limited extent, property.
50. Fluctuations in the investment ratio are red flag and should be investigated by the supervisor.

**(vii) OTHER INCOME RATIO**

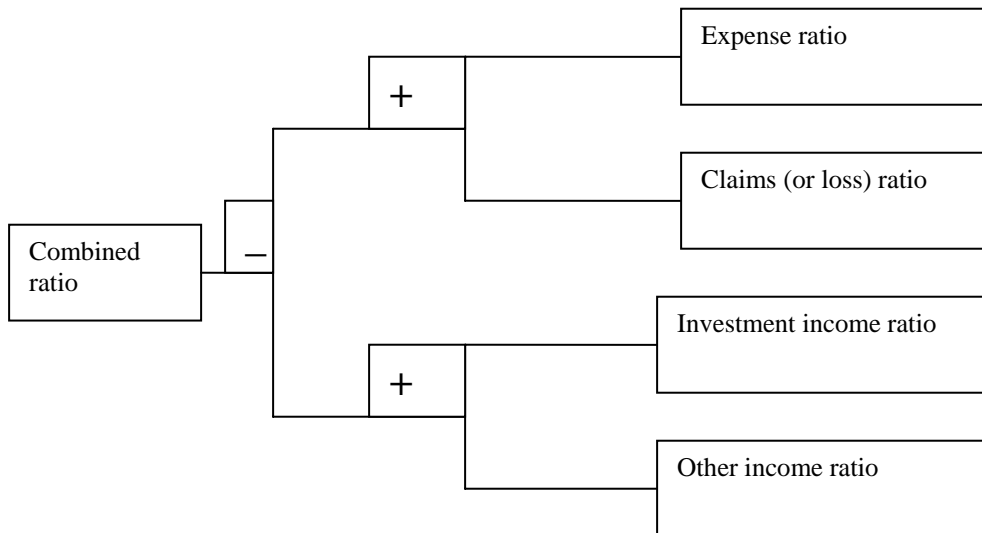
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- 51. Other income can arise from debtors recoveries (including subrogation), fees and salvage.
- 52. While it is not typically a major source of income, any unusual change in this item can point to non normal or special transactions and should be investigated. It can also point to the insurer engaging in activities not associated with the core insurance business, which is normally illegal.

**(viii) OPERATING RATIO**

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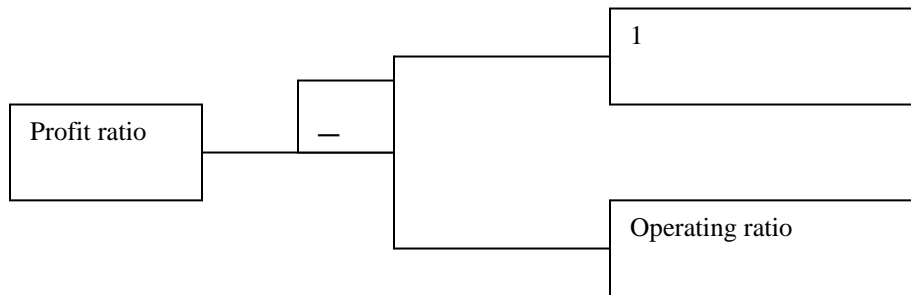
- 53. The operating ratio summarizes the total operating performance of the insurer. It shows, from a supervisory point of view, whether the insurer is able to produce an annual surplus. If the operating ratio is more than 100% then the insurer's shareholders are subsidizing management and policyholders.
- 54. In fact the ratio should strictly be 100% less the part of the investment income ratio that is produced by capital and surplus (that is 'shareholders' funds) as the shareholders would be able to make more money simply by investing it in the capital market if the underwriting activities are producing a loss. Some insurers do in fact separate

investment income into the part arising from shareholder's funds (capital and surplus), and the part arising from premium flows (net of claims and expense flows), and only use the latter in determining the investment income and operating ratios.

55. Trends in the operating ratio will show if an insurer's performance is improving or getting worse and can point to the need for supervisory intervention, or at least a more searching investigation, including possibly, an on site inspection.

***(ix)* PROFIT RATIO**

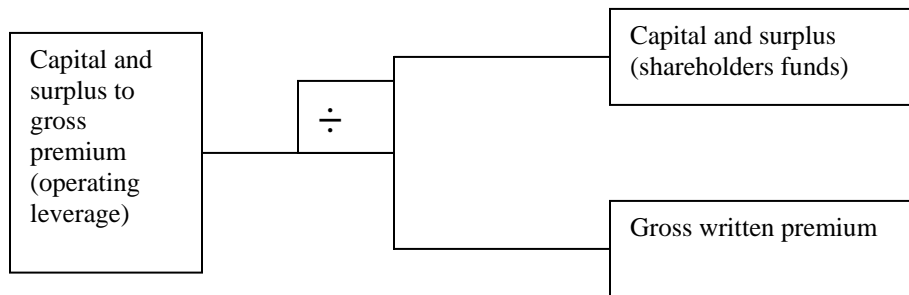
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56. The profit ratio is simply another way of looking at the operating ratio. It shows the net margin available to the shareholders and for corporate income tax after core operations are carried out.

***(x)* CAPITAL AND SURPLUS TO GROSS PREMIUM**

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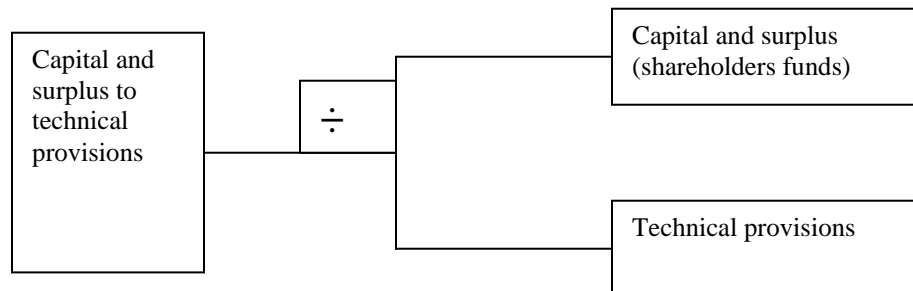


57. The capital and surplus used for the purposes of this ratio should be after deducting non approved (or admitted) assets and after adequate provisions have been set up.
58. This ratio measures how much premium can be written for a unit of shareholders' funds. If the business is profitable then the shareholders will want to maximize the amount of business they write relative to their investment in the company. However the more business a company writes the greater the potential for fluctuations in results and the greater the need for capital to cover negative fluctuations – thus there is a trade off. The law establishes the maximum leverage that an insurer can employ.

59. If the ratio becomes too high then the supervisor is required to take enforcement action in most jurisdictions.
60. An increasing trend in this ratio can be an indicator of an insurance company being stressed. Typically the ratio will be in the range of 2 to 5 for a direct insurer writing short tail business.

***(xi) CAPITAL AND SURPLUS TO TECHNICAL PROVISIONS***

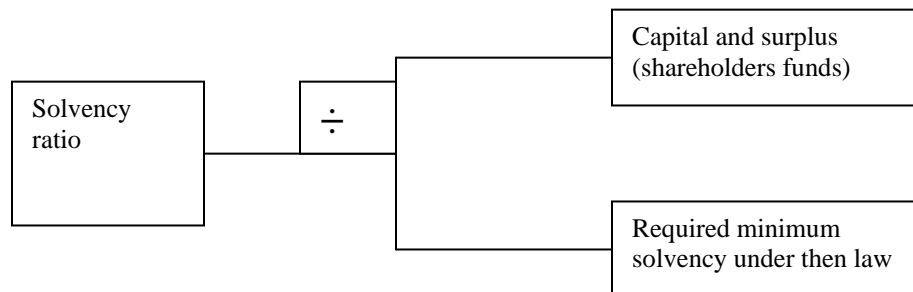
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61. Technical provisions are the sum of claims provisions, unearned premium provisions and any unexpired risk provision. They should be on a net of reinsurance basis.
62. This ratio shows how much scope there is for error in the technical provisions and is related to the value at risk concept used in banking, and increasingly in other financial sub sectors. The ratio should typically be at least 20 % (in other words there is a 20% margin for error in the technical provisions before the insurer becomes bankrupt).
63. Changes in this ratio can point to changes in provisioning standards or simply to an improving or deteriorating solvency position.

***(xii) SOLVENCY***

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64. This is the basic ratio that drives regulatory enforcement and even the placing of the insurer under administration by the supervisor. As noted, in the other jurisdictions supervisors can take control of an insurer when its shareholders' funds, measured using



statutory return accounting standards, fall below 50% of the required minimum solvency. Before that an insurer is required to produce a recapitalization plan.

65. Usually a supervisor will have intervened long before an insurer's actual solvency margin falls below the statutory minimum, based on this and other early warning ratios. Actions required may have included ceasing writing certain classes of business, changing certain management personnel and producing a business plan to retrieve the situation.
66. The actual solvency margin for a well run non life insurer is typically at least 200% of the minimum required. When the ratio falls below this the supervisor will typically begin to monitor the insurer more closely in an industrial country environment.

**NORMAL RANGES – DEVELOPING COUNTRY**

<b>Ratio</b>	<b>High %</b>	<b>Low %</b>
Premium growth rate	+40	-40
Net Retention	80	40
Expense	50	25
Net claims	80	50
Combined	105	85
Investment income	8	4
Other income	1	N/A
Operating	101	80
Profit	20	-1
Capital and surplus to GWP	50	20
Capital and surplus to technical provisions	30	10
Solvency	300	150

## ANNEX 1 - CANADIAN REGULATORY LADDER

SUPERVISORY GUIDE APPLICABLE TO FEDERALLY REGULATED LIFE INSURANCE COMPANIES

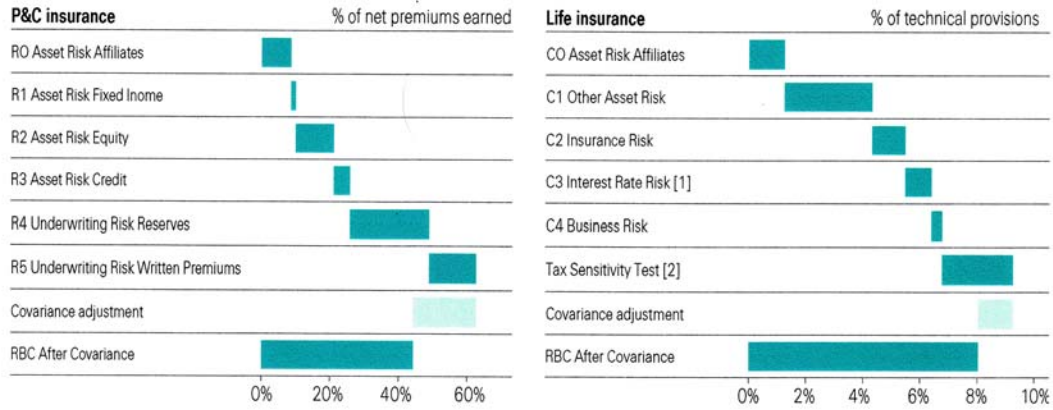
REVISED MARCH 1997 TO INCORPORATE OSFI/COMPCORP CO-OPERATION AND COMPCORP ACTIVITIES

- [STAGE 0](#) - NO PROBLEMS /NORMAL ACTIVITIES
- [STAGE 1](#) - EARLY WARNING
- [STAGE 2](#) - RISK TO FINANCIAL VIABILITY OR SOLVENCY
- [STAGE 3](#) - FUTURE FINANCIAL VIABILITY IN SERIOUS DOUBT
- [STAGE 4](#) - COMPANY NOT VIABLE/INSOLVENCY IMMINENT

## ANNEX II - US AVERAGE MINIMUM SOLVENCY (RBC) REQUIREMENTS

### Comparing Risk under the US Capital Model

Figure 3  
**Risk-based capital of US property & casualty  
 and life insurers in 2003**



[1] Including health credit risk, 0.002% of technical provisions

[2] The tax sensitivity test cancels the tax discounts included in all risk categories by assuming that the company is not a taxpayer, that its losses are of no value to another taxpayer, and that its deferred total assets and deferred total liabilities are zero.

Source: NAIC