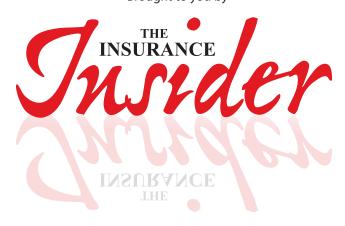
THE LITMUS RATIO GUIDE

Understanding and Analysing Re/Insurer Financials





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 $^{^{\}rm 1}$ Note: We use 're/insurers' throughout as the shorthand for 'insurers and reinsurers'



First Edition – Introduction

Non-life insurer and reinsurer analysis is a specialist area reflecting the impact of insurance underwriting on a re/insurer's financial profile.

As the main 'product' of re/insurers is the payment of claims, analysis focuses heavily on their 'security' (their future ability to pay) as well as their business performance.

This, combined with the special set of accounting items required to record non-life re/insurance underwriting income and expenses as well as re/insurance related assets and liabilities, creates a unique context for analysis.

This introductory guide summarises the key aspects of this for those either new to the subject or looking for a convenient reference guide.

Much more could be said, but this is an introductory guide and is kept as brief and general as possible.

We hope you find it useful and welcome your feedback.

Stuart Shipperlee

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Contents

Introduction	4
Ownership Types and Financial Flexibility	6
i) Publicly listed re/insurance companies	6
ii) Privately held re/insurance companies	6
iii) Mutuals	6
iv) Re/insurer subsidiaries	6
Key Ratios	7
i) Capital adequacy	7
 a) The solvency margin ('underwriting leverage ratio') 	7
b) Reserve leverage ratio	8
c) Reserve adequacy ratio	8
d) Market risk ratio	8
e) Credit risk ratio	9
ii) Operating performance	9
a) Net loss ratio	9
b) Net commission and underwriting expenses ratio	
('expense ratio')	10
c) Combined ratio	10
d) Operating ratio	10
e) Return on capital employed	11
f) Return on revenue	11
iii) Competitive position	11
a) Growth ratio	12
b) Reinsurance dependency ratio	12
iv) Liquidity	12
a) Reserve coverage	13
Size and Diversification, Capital and Debt	14
i) Size and diversification	14
ii) Capital	14
iii) Debt	15
Lines of Business	16
i) Short-tail diversified insurers	16
ii) Long-tail re/insurers	16
iii) Short-tail catastrophe reinsurers	16
Financial Metric Glossary	17



Ownership Types and Financial Flexibility

All types of re/insurer require a prudent amount of capital in order to trade and a strong enough operating performance to maintain and grow that capital in line with business objectives. Both these critical aspects of their financial profile can, however, be impacted by the nature of their ownership.

There are, in essence, four types of re/insurer ownership structure that impact analysis.

i) Publicly listed re/insurance companies

Listed re/insurers will need to achieve returns consistent with their shareholders' expectations and create faith among shareholders that they will continue to do so. Assuming they achieve that, they should have a significant degree of 'financial flexibility'. In other words if they needed more funds to maintain acceptable capital adequacy and support growth, then the equity markets can be reasonably expected to provide these.

ii) Privately held re/insurance companies

Privately held re/insurers also need to achieve returns consistent with shareholder expectations. However, the expected returns may be different from those observed in the public equity markets (for example a 'private equity' investor may require higher returns as they have less ability to rapidly trade out of their investment by selling shares, or to maximise the value of the re/insurer with a view to a future listing). Depending on the nature of the investor(s), financial flexibility may be less strong than for a typical listed firm.

iii) Mutuals

As mutual re/insurers are owned by their policyholders ('members') not by shareholders, different measurements for performance may be set by the management than might be expected from a stock company (minimising premium rates rather than maximising profits for example).

Moreover, some mutuals (such as protection and indemnity clubs) may operate on the basis that, in the event the premiums paid by the members prove insufficient, additional funds can be 'called up'.

This ability can also be seen as a form of financial flexibility although it may be offset by the mutual carrying less capital in the first place. Mutuals lacking this retrospective 'premium callup' option may lack financial flexibility. In turn a reason for them to hold more permanent capital.

iv) Re/insurer subsidiaries

Operating re/insurer subsidiaries of any of the above can also be impacted by the way capital and risk is managed across the whole business. A parent or sister organisation may 'protect' the re/insurer by providing intra-group reinsurance cover.

More generally capital levels may be kept low with an explicit or implicit commitment from another part of the group to provide more capital if and when required.

Key Ratios

Patios are used to help set the various risk and business accounting items in context.

Many different aspects of re/insurer income statements and balance sheets can be looked at but certain ratios are invariably among the most widely used.

Here we list our view of the most common, how they are calculated and what they are used for.

While the metrics referenced are ratios, they are more usually quoted as percentages. In this guide we describe them as one number divided by another (e.g. 'net written premium/ shareholders' funds').

i) Capital adequacy

Capital adequacy ratios give a perspective on the degree of risk the re/insurer takes relative to the amount of capital it has. All other things being equal, the better the capital adequacy the safer the re/insurer (although that doesn't necessarily make it a good business investment).

Unlike most businesses 'debt' is not the principal source of 'leverage' in a non-life re/insurer's balance sheet. Indeed many re/insurers carry no debt at all other than for short term liquidity management purposes. We therefore deal with this separately under 'Size and Diversification, Capital and Debt'.

'Capital' itself gets called many different things depending on the circumstances. We run through that too in 'Size and Diversification, Capital and Debt'. For the purposes of this section we use the term 'shareholders' funds' for 'capital'. Despite the term, the same ratios that follow are also used in the analysis of mutuals.

- a) The 'solvency margin' (also known as the 'underwriting leverage ratio')
- What is it? Net written premium/shareholders' funds.
- Why is it used? The last reported annual net written
 premium acts as a proxy for current-year underwriting
 activity. The greater the premium written relative to
 shareholders' funds, the greater the risk being taken with the
 capital.
- Keep in mind: Lower risk lines of business require less capital relative to premium than higher risk lines. Also, under-priced business actually makes this ratio look better!
- Other: Sometimes the ratio is calculated the other way up (especially in the U.S.). Check which way it is being used.

All other things being equal, a higher number is: Worse¹

¹ Note: If this ratio is calculated with net written premium as the denominator, then a higher number is better



b) Reserve leverage ratio

- What is it? Net loss reserves/shareholders' funds.
- Why is it used? If loss reserves prove to be inadequate then, other than raising new capital, the extra reserves come directly from the existing shareholders' funds. So the bigger the ratio of loss reserves to shareholders' funds the bigger the problem if extra reserving is required.
- Keep in mind: Longer tail lines require higher reserves. Also, if a re/insurer 'over-reserves' this ratio will look worse than it should (and vice-versa if it 'under-reserves'). See 'Reserve adequacy ratio'.
- Other: Sometimes the ratio is calculated including premium reserves as well (which will typically make it 20% to 40% higher).

All other things being equal, a higher number is: Worse

c) Reserve adequacy ratio

- What is it? Net loss reserves/net written premium.
- Why is it used? It is difficult to know what to think about 'reserve leverage' without having a view on 'reserve adequacy'. By comparing reserves to premiums we get an idea of the degree of conservatism in the re/insurer's reserves.
- **Keep in mind:** This is extremely 'line of business' sensitive. Longer tail lines should have higher levels of reserves.
- Other: Comparisons to peers writing similar business is a good idea when looking at this.

All other things being equal, a higher number is: Better

d) Market risk ratio

- What is it? Invested assets/shareholders' funds.
- Why is it used? Reductions in the values of invested assets reduce the level of shareholders' funds by the same amount. Hence, the greater the proportion of invested assets to shareholders' funds the bigger the impact of a fall in their value.
- **Keep in mind:** Lower risk underwriting portfolios can justify higher risk investment portfolios (and vice-versa).
- Other: Historically some invested assets (such as equities)
 were seen as much more prone to material falls in value than
 others (such as government bonds). The Eurozone crisis has
 undermined that logic to some degree but understanding
 the riskiness of different investment types remains key.

All other things being equal, a higher number is: Worse

e) Credit risk ratio

- What is it? (Reinsurance recoverables plus other insurance debts)/shareholders' funds.
- Why is it used? Any unrecoverable reinsurance reduces shareholders' funds by the same amount. The greater the proportion of these (and other insurance debts) to shareholders' funds the bigger the risk from bad debts.
- Keep in mind: For longer tail cedants the majority of 'reinsurance recoverables' may well be from the 'reinsurers' share of technical reserves. Not all financial reporting regimes show this and, if so, the reinsurance recoverable asset may be significantly understated.
- Other: 'Financial strength' ratings of reinsurers are typically used to measure the riskiness of reinsurance recoverables (although these address only the reinsurer's perceived ability to pay, not its willingness to pay).

All other things being equal, a higher number is: Worse

ii) Operating performance

For almost all non-life re/insurers two main types of income exist; underwriting income and investment income. The latter comes from receiving premiums up-front and only having to pay claims months, or years, later. However, while re/insurers typically seek to set prices that make underwriting profits, competitive pressures can lead to under-pricing and, hence, claims payments and expenses turn out to be higher than the premiums received. The following ratios address various aspects of a re/insurer's performance as a business in this context. They also highlight the performance relative to the capital invested in the business.

a) Net loss ratio

- What is it? Net losses paid and outstanding¹/net earned premium.
- Why is it used? It tells us how much of the premium income being earned is paid out in claims (or is used to create reserves for expected future claims from the business already underwritten).
- Keep in mind: Higher risk lines of business will have more volatile loss ratios. Also, 'calendar year' accounting means the impact of any 'over' or 'under' reserving from prior years, recognised in the latest year, will be reflected in the latest year's result.
- Other: Calculating the loss ratio 'gross' (before the cost of outwards reinsurance and before actual or expected reinsurance recoveries) helps give a picture of the underlying quality (i.e. 'intrinsic profitability') of the underwriting book.

All other things being equal, a higher number is: Worse

¹ Note: Net losses paid and outstanding = net losses incurred



- b) Net commission and underwriting expenses ratio (also known as the 'expense ratio')
- What is it? Net commission & underwriting expenses/net written premium.
- Why is it used? It tells us how much of the premium income written is used to acquire the business and run the underwriting operations (i.e. before any claims are paid).
- **Keep in mind:** The 'distribution model' of the re/insurer can make a significant difference. Some low risk lines of business can have high distribution costs.
- **Other:** Sometimes this is calculated versus net 'earned' premium rather than net 'written' premium.

All other things being equal, a higher number is: Worse

c) Combined ratio

- **What is it?** The net loss ratio *plus* the net commission and underwriting expenses ratio.
- Why is it used? It gives a quick fix on whether underwriting
 is profitable and the degree of profitability. Below 100%
 implies an underwriting profit, above 100% implies an
 underwriting loss.
- Keep in mind: This ratio tends to penalise longer tail
 re/insurers versus shorter tail businesses as it ignores
 investment income. The 'operating ratio' addresses that.
 However, sometimes the combined ratio is also called the
 'combined operating ratio'. The semantics do not matter but
 it is important to be clear what is actually being referred to.
- Other: If net 'written' premium is used in the original expense ratio calculation the maths for this ratio is technically incorrect (adding together two fractions with denominators that are different). The effect is that if a business is growing quickly a combined ratio below 100% could still indicate a loss.

All other things being equal, a higher number is: Worse

d) Operating ratio

- What is it? The combined ratio *minus* (net investment income/net earned premium).
- Why is it used? It gives a quick fix on overall profitability by subtracting investment income (the main other aspect of a non-life re/insurer's business) from the combined ratio. A ratio below 100% implies an overall profit, above 100% implies an overall loss.



- Keep in mind: Longer tail lines of business require higher levels of reserves held for longer periods of time and so should generate higher investment income.
- Other: Unrealised investment gains or losses are usually not included (or smoothed over several years) although this is dependent on the financial reporting regime.

All other things being equal, a higher number is: Worse

e) Return on capital employed

- What is it? Pre-tax result/prior year's shareholders' funds.
- Why is it used? It gives a picture of the pre-tax yield the re/insurer is generating on the amount invested in the business
- Keep in mind: This should reflect the risk profile of the re/insurer. Higher levels of underwriting and/or investment risk should be accompanied by higher levels of return on capital employed.
- Other: Mutuals will often not have this measure as a direct performance indicator given their goal is not profit maximisation. Nonetheless, generating a sufficient risk-adjusted return is intrinsic to long-term prudential management of a re/insurer of any type.

All other things being equal, a higher number is: Better

f) Return on revenue

- What is it? Pre-tax result/total revenue.
- Why is it used? It gives a picture of the operating margin the re/insurer has.
- Keep in mind: As with return on capital employed, this should reflect the risk profile of the re/insurer. Higher levels of underwriting and/or investment risk should be accompanied by higher levels of return on revenue (i.e. higher overall margins).
- Other: Several other approaches to this calculation exist through the exclusion of various expense items considered 'non-operational' (interest payments, depreciation and amortisation) and excluding unrealised and realised investment gains or losses.

All other things being equal, a higher number is: Better

iii) Competitive position

As noted in 'Operating performance', competitive pressures can lead to underwriting losses (due to inadequate risk pricing). Hence it is important to consider the re/insurer's competitive position.

We comment on the significance of absolute size and market share later, but two ratios specific to the re/insurer also help with the analysis of this.



a) Growth ratio

- What is it? (Current year gross written premium/prior year gross written premium) minus 1.
- Why is it used? A sustainable business is assumed to require healthy, but controlled, year-on-year growth and, for a nonlife re/insurer, the increase in gross business underwritten is the purest growth measure.
- Keep in mind: Very few industries offer the easy potential for 'dumb' (i.e. loss making) growth available to non-life re/insurers. Also, as re/insurance pricing is typically cyclical, written premium levels may fall in a down-cycle and increase in an up-cycle even if the actual amount of risk underwritten remains flat.
- Other: Changes in net written premium levels are also very interesting but indicate less about the market distribution power of the re/insurer than the gross numbers.

All other things being equal, a higher number is: **Better** (until it becomes too much)

b) Reinsurance dependency ratio

- What is it? Net written premium/gross written premium.
- Why is it used? Gives a quick fix on the extent to which a
 re/insurer relies on outwards reinsurance capacity.
 Reinsurance is, in effect, a capital substitute and a re/insurer
 that is overly reliant on it may lack bargaining power with its
 reinsurers and be overly exposed to changes in reinsurance
 pricing that it may not be able to pass on.
- Keep in mind: The degree and nature of the exact protection gained from the reinsurance programme may be only loosely correlated with the premium amount of reinsurance purchased.
- Other: Too little use of reinsurance protection, especially for smaller re/insurers and those in volatile lines of business, is risky.

All other things being equal, a higher number is: **Worse** (until it becomes too little)

iv) Liquidity

Unlike banks, non-life re/insurers should not really have a fundamental liquidity management challenge. They are, after all, paid up-front for the 'product' they provide. Nonetheless it is important to monitor the extent to which the re/insurer's balance sheet is 'liquid' – i.e. that it has enough of the right kinds of assets that can easily be turned into cash, as needed, when claims come in.



a) Reserve coverage

- What is it? Liquid assets/net technical reserves
- Why is it used? Technical reserves roughly represent the amount the insurer will need to pay out in claims beyond the cash it is receiving for current year premiums.
 Low liquid assets relative to reserves could lead to a need to sell poorly performing assets at a bad time and crystallise an investment loss.
- Keep in mind: For long-tail re/insurers a lot of reserves represent expected claims payments not due for several years, so this ratio may overstate the liquidity requirement.
- Other: Financially sound re/insurers have various ways to manage short term liquidity pressures, so this is most likely to be an issue for weaker re/insurers or at times of general economic crisis. The failure of, or slow payments by, a major provider of reinsurance cover to the re/insurer however could substantially increase a liquidity problem.

All other things being equal, a higher number is: **Better**



Size and Diversification, Capital and Debt

i) Size & diversification

Size matters in re/insurance primarily because it supports both market power and the ability to diversify.

Market power in essence means the extent to which the re/insurer can influence pricing and related terms and conditions. Consequently, it is market share (i.e. size relative to the markets it trades in) rather than absolute scale that matters. However, a relatively big player in a small niche may still find things like the cost of reinsurance cover and pressure from brokers on pricing difficult to control if they lack absolute scale.

The ability to diversify (both in underwriting and investments) is more directly linked to absolute size.

For investments an important additional factor is a re/insurer's domicile. Or more accurately the currencies in which it receives premiums and pays claims. If a re/insurer's business is entirely in its domestic currency, then it either has to invest domestically or take currency risk. Given the volatility of foreign exchange markets the latter can be a serious issue. But, for domestic re/insurers in smaller economies, there may only be limited ability to diversify via local investments.

'Gross premium' is most commonly the key size measure for market power, whereas 'capital size' is typically the key metric for diversification ability.

ii) Capital

'Capital' for a re/insurer is the difference between the value of its assets and its liabilities. This is exactly analogous to the idea of a home owner's 'equity' in a property (the difference between the value of the house and the outstanding mortgage).

Different accounting and regulatory regimes have different rules for valuing assets and liabilities which can lead to a lot of complexity in the calculation details, but the principle is always the same; the difference between assets and liabilities.

There are, however, many different terms for this depending on the context. Here we list some of the more common.



- Shareholders' funds: term most commonly used within the industry outside the U.S.
- Policyholders' surplus: most commonly used in the U.S.
- Statutory surplus or regulatory capital: term used when applying regulatory rules for calculating assets and liabilities.
- **Capital employed:** mainly used in profitability or investment analysis.
- Equity or shareholders' equity: mainly used in profitability or investment analysis.
- Own funds: used in Solvency II (which has its own set of accounting 'rules').
- Available capital or risk capital: terms commonly used in 'capital models' (see below).
- Capital and reserves: common accounting term ('reserves' is confusing in this context as this does not relate to 'technical reserves' but rather money that belongs to the shareholders over and above what was paid in as capital by them, e.g. retained profits).

Another common reference to 'capital' is in 'capital models'. In essence these measure the amount of capital 'available' (that is, 'assets minus liabilities' based on a defined set of accounting rules) and compare this to the amount of capital 'required' (i.e. the amount required to be 'safe' relative to a view of the acceptable risk of insolvency). The latter reflects the sources of risk looked at under 'capital adequacy' earlier, with a minimum standard for each area of risk being set and then aggregated together. Usually some form of diversification measure across different sources of risk is also then applied.

iii) Debt

In most businesses, 'debt' (i.e. 'borrowing') is a critical measure of risk. The term 'leverage' (or 'gearing') relates to how much debt the firm has relative to its own capital.

However, as re/insurers use their capital to take insurance underwriting risks (hence the 'underwriting leverage' and 'reserve leverage' seen earlier), they have only a limited capacity to further leverage their capital by borrowing. Nonetheless, some use of 'debt capital' can make economic sense and is a feature of some re/insurer balance sheets. Also, some types of 'debt capital' can be viewed as having 'equity like' characteristics (e.g. debt with very long maturities) and be given some credit in rating agency or regulator calculations of 'available capital' (see above). This can be a complex area and is outside the scope of this introductory note.



Lines of Business

Different types of non-life re/insurance have very different risk profiles.

Business done in large volumes for relatively small individual exposures (e.g. private household insurance) may suffer from price competition overall, but no one loss will be significant. Also losses will be known about and paid quite quickly (known as 'short-tail' business) so the risk of loss reserves being too low is quite small.

A scenario that changes this is a single event that triggers a mass of individual claims (e.g. a hurricane). Insurers typically reinsure this catastrophe ('cat') risk; thereby passing it on to reinsurers.

Larger commercial insurance, by contrast, carries the risk that individual losses can be very large (e.g. aviation).

Finally, liability (or casualty) business (in the broadest terms, insurance against being sued) can have very long lead times before a re/insurer may have to pay a claim (e.g. as with the very slow development of an industrial disease such as asbestosis). This is known as 'long-tail' business. A related problem is that social, medical, political or legal changes often take place after the risk was underwritten. This can lead to both higher and more frequent court awards than were 'priced into' the original premium rates.

The risk profile and financial performance of a re/insurer therefore needs to be set in the context of the mix of business that it underwrites. Broadly from the above there are three categories of re/insurer relevant to analysis.

i) Short-tail diversified insurers

Assuming they 'reinsure' exposure to catastrophes these need lower levels of reserves and can tolerate higher degrees of underwriting leverage than riskier re/insurers.

ii) Long-tail re/insurers

Will need to carry reserves for many years so 'reserve adequacy' ratios should be a lot higher than for short-tail businesses. Investment income is likely to be an important part of their operating performance.

iii) Short-tail catastrophe reinsurers

Can have several years of very strong results due to lack of catastrophes and then suddenly have a terrible year or two (e.g. 2004, 2005) as their luck turns. Typically, other than in the immediate aftermath of a catastrophe, they will not need high reserves, but they will need a lot more capital relative to premium written (i.e. lower underwriting leverage) than re/insurers in other lines of business.

In practice, larger insurers are usually a mixture of the first two and reinsurers are often a blend of all three. Some specialist re/insurers are significantly exposed to large commercial business (both short-tail and long-tail) and there are also various niche players focussed on individual business lines (e.g. pet insurance, legal expenses insurance etc.)

Financial Metric Glossary

Net

The position after the costs of, or receipts from, the purchase of reinsurance.

Gross

The position before consideration of the impact of reinsurance.

Net written premium (NWP)

The amount of business underwritten during the accounting period minus the cost of reinsurance purchased.

Net earned premium (NEP)

That part of the NWP for which the re/insurer is 'on risk' during the accounting period (includes business underwritten in prior period(s) but for which premium has been earned in the current period; excludes business underwritten in this period but for which premium will be earned in the future).

Net losses paid and outstanding (NLPO), also known as 'net losses incurred'

Losses paid and reserves set up for future claims minus recoveries from reinsurers, reinsurers' share of future claims and losses paid that were reserved for in prior periods.

Net underwriting commission and expenses (NUCE)

Commission paid to brokers and underwriting expenses minus commission received from reinsurers (often also includes some allocation of overall corporate expenses).

Shareholders' funds (SF)

The difference between the value of the assets of the insurer and its liabilities. Concept applies equally to mutuals. Some of the different terms for this are covered in 'Size and Diversification, Capital and Debt'.

Net loss reserves (NLRes)

The amount of money set up for known (or expected) claims not yet paid on business already underwritten minus the reinsurers' share of these claims.

Incurred but not reported (IBNR)

That part of loss reserves that reflect expected future claims that have not actually yet been reported to the re/insurer.

Net premium reserves (NPR)

The amount of the premium underwritten that is not 'on risk'



during the reporting period minus the reinsurers' share of this.

Net technical reserves (NTR)

Net loss reserves plus net premium reserves.

Invested assets (IVA)

Non-cash (or cash equivalent) investments such as equities, bonds or property.

Liquid assets (LA)

Tradeable (liquid) invested assets plus cash and cash equivalents (e.g. bank deposits).

Reinsurance recoverables (RER)

The amounts due from reinsurers on claims paid or reserved for.

Other insurance debts (OID)

Premiums due from brokers, agents or cedants on business already underwritten.

Reinsurers' share of technical reserves (RTR)

That part of reinsurance recoverables that is for the reinsurers' share of claims not yet paid and premiums not yet earned.

Should you have any differences of opinion, comments or questions about any areas of this publication, we would be delighted to hear from you. Please email info@litmusanalysis.com



LITMUS ANALYSIS

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