

Insurance Primer

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Mats Larsson, October 30, 2018

Our agenda for today

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8.1 The Basics

Taking on risk for money

Life presents us all with a wide variety of risks. This gives us a choice to either accept the consequences of those risks, should they materialize, or to try to protect ourselves from these consequences and by this reduce the exposure to various perils. Insurance companies protect against the financial risks of both retail customers and those of corporations. Those who purchase insurance protection transfer the risk to the insurance company who accepts it in exchange for a payment generally called a premium. Thus, insurance companies provide their clients with economic protection for clearly identified risks within a predetermined time period.

Premiums and claims

Purchasing insurance is the most common type of risk transfer in modern societies. Insurance developed in Italian cities such as Genoa in the fourteenth century to support maritime activities and the first insurance regulation appeared in 1336. Insurers protect against defined loss of a car, a house or even a life and pay the policyholder in the event of that loss. The policyholder who has suffered a loss presents a claim and requests payment. The insurance company provide financial compensation if the claim accurately fulfills the conditions of the agreed contract.

Insurers protect against economic losses as outlined in so-called insurance policies. The product that insurers sell is a financial contract between two parties and as such an intangible good.

Picture 8.1. Risk Transfer Through Insurance



An intangible product

Source: Million Dollar Booking

Asymmetries...

While the probability of a risk materializing might be very small, the consequences for a person or a company if they should occur can be tough or even impossible to handle. Insurance companies pool and diversify the risks and can by this muster the above asymmetry between probabilities and effects. Policyholders pay a relatively small amount in premiums to protect themselves from a large but improbable loss.

...disappear when diversified

With sufficient number of insurance customers doing the same thing and as only a small portion of the customers are likely to suffer losses, the funds available to pay claims increase and the risk of any single person or company exhausting the funds grows smaller. Risk pooling allows payment of claims to the few from the premiums of the many and since the correlation of different contracts isn't perfect there is a diversification effect lowering the risk level. The premise that a large number of not perfectly correlated risk contracts will produce a well-behaved and predictable aggregate is mostly true – but not always.

A social good

By this risk transfer insurance companies provide a social good. Protection from financial losses provides a security to people and organizations that gives them an ability to peruse opportunities, invest assets and develop ideas without having to handle the risk of financial devastation. Without insurance a larger portion of a society's resources would be devoted to risk mitigation instead of productive development. To be able to fulfil this societal role it is vital that insurance companies have enough funds to meet their claims. To make sure of this the society sets regulatory minimum standards for the capital level of insurance companies.

Beware of chefs!

To illustrate the societal benefit; assume there are 1,000 restaurants each worth SEK 20m and each with the probability of 0,1% of burning down. Without insurance each restaurant owner would have to hold SEK 20m as a contingency (in total SEK 20bn) but just one owner will actually suffer the pain of watching his chef burning down the place.

Ignoring operational costs and profit requirements, an insurer can charge each restaurant owner $\text{SEK } 20\text{m}/1,000 = \text{SEK } 20,000$ to cover the risk. The capital kept as a contingency for potential fires has gone down from SEK 20bn to SEK 20m and the restaurant owners have switched the need of holding funds of SEK 20m against the certainty of paying SEK 20,000. The higher the diversification effect the higher the benefit with insurance and the higher prices can be charged in relation to the experienced severity of the risk.

The law of large numbers

Insurance companies take over insurable risks. Not all risks are insurable and not all insurable risks are equally good. In general an insurer wants to see a large number of similar risks to apply the law of large numbers in calculating the premium, losses that are random plus outside the policyholders control to avoid moral hazard and little aggregation of risks as correlations risk to increase the total net exposure. Further, the probability and scope of losses must be possible to forecast and the economically viable premium must be lower than potential loss or insurance will make no sense for customers.

Picture 8.2. Fire is Just One of the Many Risks of Life



"Life is either a daring adventure or nothing at all" / Helen Keller

Source: Emerald Preventive Health Care

Making money 2 ways:
underwriting...

Most companies make money in just one way. Insurance companies make money in two ways; from underwriting profits and from investment proceeds. Underwriting profits entails charging premiums that exceed both the insured claim losses and the expenses of the insurance organization. A profitable underwriting operation requires an underwriting process that assesses the risk, including the likelihood of claims and the cost should they occur, plus the pricing ability or willingness to charge premiums that cover cost and expenses.

...and investing

The second way insurance companies make money is from investment income. Since policyholders often pay their premiums up front, prior to the period during which they are insured, insurance companies have a cash flow, an interest free loan, that they can invest and generate investment income from until they have subsequent outflows due to claims. Some of the investment income have to be paid out to the policyholders but otherwise the insurer can keep the proceeds.

Float

The interval that funds can be held between the time the insurance receives the premium and the time a claim against the policy is made is known as the float (and investment income is therefore sometimes called float income). On top of investing their customers' premiums, insurance companies also in parallel invest much of their own equity capital in the same way and insurance companies are among the largest asset managers globally.

Income before costs...

In most industries a company first incurs costs to purchase equipment and input material and then to manufacture something. Only later when the product is sold revenues are recognized. In the insurance industry the product is sold first and the costs from possible claims are incurred later. The costs for the insurance company's product are unknown before the actual occurrence – if any – of the insured event, while the premium from policyholders is defined by the contract. Seen from the customer's point of view this is a core feature of the product as the insurer helps the customer convert unquantified risks into a known cost.

...and profits are estimates

Hence, the revenue-cost sequence is reversed and the product is priced and sold based on estimates of the future costs it will incur and of the expected investment return that can be generated from the float. Naturally, these estimates can turn out to be wrong for a number of reasons including claim cost inflation, social or legal changes, catastrophes leading to large one-off claims or losses in the investment portfolio. This also makes current profits for insurers an estimate.

The next CEO will have to face the music

With the upside coming first and the downside not arriving until later (perhaps even under an entirely new management regime) the incentives for insurance executives is unfortunately to chase growth at the expense of quality underwriting and longer-term profitability. When one insurance company grows substantially faster than its competitors this is quite often an accident waiting to happen. Partly this is because those who take market share do this by lowering prices and by this risk compromising underwriting margins, partly it is because the customers that are attracted to low prices tend to leave as soon as someone else gives them a better offer.

Provisions a judgement call

If you are willing to sacrifice long-term profitability, insurance companies have ample ability to boost short-term sales growth and earnings growth by underpricing risks. Many insurers don't know their full cost until many years after the policies have been sold – no wonder there is a tendency to match the lower pricing that now and then plague the industry rather than risk missing current sales. As we will see later, companies must make provisions for later costs but the size of these provisions is somewhat of a judgment call.

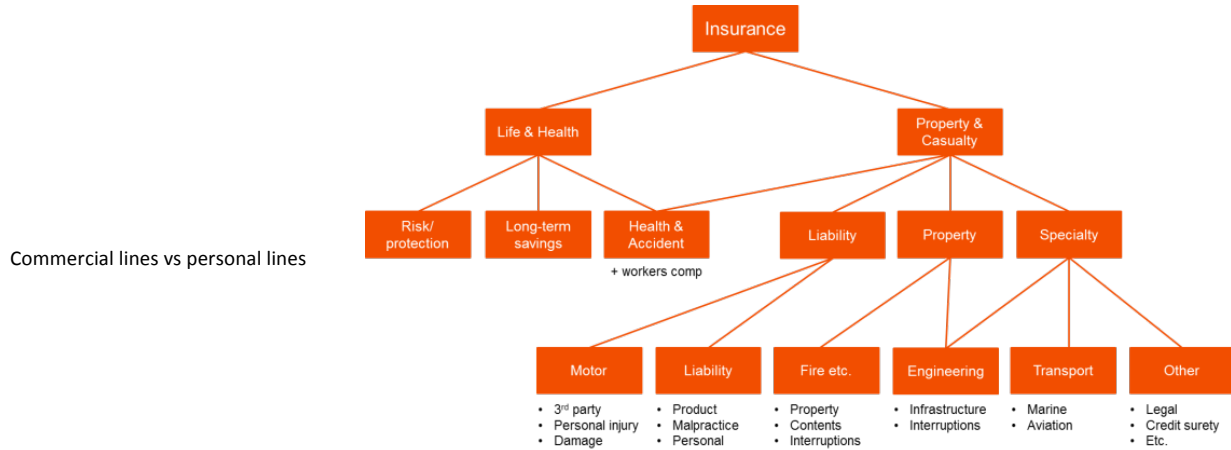
Insurers

- Property & Casualty (P&C)
- Life & Health (L&H)
- Reinsurance

There are three major types of insurance companies; 1) property & casualty insurance (P&C or general insurance or non-life insurance), 2) life and health insurance (L&H, or just life insurance) and 3) reinsurance companies. We will cover all three types further below. Specialty insurers are P&C insurers that take on more unusual types of risks. Insurers that engage in both P&C, L&H and possibly also reinsurance are at times called multi-line insurers. Another segmentation that can

be made is the one between insurance products targeting organizational clients (“commercial lines”) and those targeting individual retail clients (“personal lines”).

Picture 8.3. The Segments of the Primary Insurance Sector



Source: The author

Limited liability vs...

Further, insurance companies generally come in one out of two legal structures, either a mutual company or a limited liability corporation. Mutual insurers are owned and run for the benefit of their policyholders. This makes it hard to raise money from financial markets but on the other hand policyholders can at times receive a policyholder dividend if the financial standings of the mutual company are strong enough.

...the mutual company

The mutual company could operate with less demanding profitability requirements, benefitting the policyholders, but they on the other hand in principle have unlimited liability if the mutual company would see its buffer capital dwindling. The last few decades many mutual companies have reformed to become limited liability companies through what’s called a demutualization.

Long tail vs short tail

Different types of insurers will have different duration of their claims due to the type of protection they sell – they are so-called short tailed or long tailed. The duration depends both on the length of the contracts and the time it takes to settle claims. Generally life insurance companies will have longer duration claims than P&C insurance companies, although some specific products within P&C can have longer duration. With predominantly short-term obligations towards their customers, asset portfolios in the investment business should be more liquid and low risk in nature than otherwise.

The state; a regulator and a competitor

The state and the public sector in general is the regulator of the insurance sector but through social security systems the public sector is also a huge participant supplying insurance. The premiums are in the form of taxes or mandatory social security contributions based on the citizens' salaries and the claims arise in case of illness or injury, unemployment, old age etc. Since the contribution is made in relation to income while the access to the system is equal, or at least more equally spread than the contribution, social security systems are apart from insurance systems also a form of wealth distribution process.

Uneven usage

The relative size of insurance companies is often judged by the amount of premiums written during a year (more often P&C) but also at times by the size of their assets (more often life). About 15 insurers can be said to be truly multinational.

The usage of insurance in emerging markets are many times lower than the one in developed markets, even when considering purchasing power parity adjustments. In some parts of Africa the sector is almost non-existent. That said the growth rates have been much higher in emerging markets allowing the global insurance sector to grow marginally faster than nominal GDP the last 3 decades.

Buffett likes insurance

Some of the largest insurance companies globally – often multi-line insurers - are AXA from France, Allianz and Munich Reinsurance from Germany, Metropolitan Life, Prudential Financial, AIG, State Farm, Berkshire Hathaway and UnitedHealth Group from the US, Japan Post Insurance, Swiss Re from Switzerland and Assicurazioni Generali from Italy. Among those MetLife and Prudential have demutualized to become shareholder owned companies and by this have to answer to new owners.

Picture 8.4. The Iconic MetLife Tower, Madison Avenue, Manhattan



Chrysler building to the left was the tallest building in the world from May 27, 1930 to April 30, 1931

Source: InsuranceNewsNet

8.2 Operations

Actuaries

The operations of an insurance company include a number of employee functions performing various tasks. Most of them apply to all types of insurers but some of the profiles are more related to P&C insurance. Actuaries use statistical data to determine probabilities and by this develop and price typical policies, set reserve requirements for anticipated claims and in general construct insurance products that can provide profits.

Underwriters

The underwriters' job is to evaluate if a specific risk could be profitably covered and, if so, under which terms/at which price – or if the insurance company should reject taking on the risk. In their work they use a combination of data analysis, interviews and experience to evaluate business opportunities. Increasingly the underwriting of simpler insurance products like auto insurance has been automated and digitalized.

Self-selection: an effort of a poor risk to seek insurance coverage - for example a person with declining health seeking health insurance.
Adverse selection: a situation of asymmetric information where the would-be policyholder has (negative) information on his risk profile the insurer has not. In the situation where a sickly person has a higher propensity to purchase health insurance, premiums then must go up to cover all costs and potentially the price will be too high for a healthy person

The underwriter must screen applications for self-selection and adverse selection to be able to charge sufficiently. Before the contract is signed the customer knows more about the true risk than the insurer and after the signing the customer might become more negligent in loss prevention. Measures to handle some of these aspects are discounts for those policyholders who can show longer time periods without claims, a so-called deductible (or excess) where the insured pays part of the loss and different conditions that have to be followed for losses to be covered.

Claims personnel, adjusters

Claims personnel evaluate the claims of policyholders and determine, or settle, the amount that the insurance company pays to compensate for the loss of the policyholder. Mostly it is a desk job at the insurance company's premises but it could also be a field job where so-called adjusters conduct investigations on larger claims or with regards to suspected fraudulent claims. Generally in insurance, a few contracts account for the majority of losses.

Claims management is also a large operational cost in P&C insurance and must as such be handled efficiently. Since payments from claims are the only tangible benefit of insurance for policyholders it is important that insurance companies build a reputation of fair and swift handling – or else the insurer risk losing their good customers to a competitor.

Picture 8.5. Misunderstood the law of large numbers?

A policy coming to an end



"There must be some mistake. According to our actuary tables I'm going to live to 83."

Source: cartoonstock.com

Investment managers

Investment managers invest clients and the insurance companies own funds in securities to earn investment income while they at the same time must ensure sufficient liquidity to pay claims in a timely manner. Two important concepts in the investment management are asset-liability management (ALM) to allow for timely payments and the resulting liability driven strategic asset allocation.

Larger portfolios for life insurers

Insurers must manage the balance and risk of a mismatch between assets and liabilities. Hence, insurers invest assets to quite closely match their liabilities and the result is often a significant allocation to fixed income investments with similar duration as the claims liabilities. The Finnish insurer Sampo has the last few years very successfully earned money from allowing a duration mismatch providing a higher investment income.

Life insurance payouts are longer-term with a typical duration of perhaps 10-12 years and maximum durations of 50 or even 60 years. The cash inflows are nominal and reasonably well known ahead of time. The complication is the guarantees made and the options that the insurer has sold have in combination with an unknown future investment result.

For example in profit-sharing products the upside is shared with policyholders but the downside stays with the insurer. Although the duration of assets often are lower than of the liabilities and although fixed investments dominate, the large float leads to larger assets under management and life insurers are often among main shareholders on global equity markets.

Fixed income dominates

P&C insurance liabilities have a duration of perhaps 3-4 years. The payouts are exposed to inflation risk and their timing and size is more uncertain. Real assets like equities, real estate and commodities can mitigate some of the inflation risk but with the short duration the portfolios will still be dominated by fixed income to ensure timely payments.

Risk and capital managers etc.

In risk and capital management, companies identify and model risks and manage the (regulatory) capital that has to be held against these risks plus the need for ceding business to reinsurance. We will return to capital management in a later chapter. Further, there are numerous positions in for example accounting, IT, management, human resources etc.

Churn management

Since the cost of winning a new customer is higher than keeping an existing one and as long-term customers are less price sensitive and their risks are more well-known churn management is an important area. Churn rates in life is about 5% per year in Europe and they are 5-10% in P&C insurance. Segments like auto insurance in Anglo-Saxon countries have higher churn rates.

Sales & marketing

The sales and marketing operations of the insurance industry is handled by both internal and external manpower. Insurance is marketed and sold through a large number of channels such as mail, telephone, online, workplace programs and face-to-face meetings.

Laps rate, % - the number of policies that haven't been renewed as a proportion of the total number of policies at the beginning of a period

The people selling the insurance policies could either be employed by the insurance company or they could work for an external firm - so-called direct writing or indirect writing. The sales channel mix varies between regions and products. Scandinavian P&C insurance is to a very high degree sold through direct writing, making it profitable in relative terms partly since customer relationships from direct writing tend to be stickier with lower laps rates. A position as the retention leader on a market is very favorable since less resources have to be spent on bringing in new customers and the focus could instead be on expanding the share of wallet.

Direct vs indirect writing

Direct writing refers to insurance companies selling their policies through an internal sales force and by this the insurance company is in control of the client list. Indirect writing is the practice of selling through external brokers or agents who propose different policies to their own customers and the insurance company doesn't have to dedicate internal resources to building up an internal sales force.

Commissions

The insurance broker represents the insured client and can choose between various insurance providers while the insurance agent is captive of one specific insurance company. The insurance broker is rewarded with a commission by the insurance company when selling policies. The commission rate is often a percentage of the premium and is determined in a negotiation with the insurance carrier and as it is a payment from the insurer to the broker it has been somewhat invisible for the insured. In some commercial line contracts however the compensation to the broker will instead be a fee paid directly by the insured.

Picture 8.6. A Swedish insurance broker turned asset manager



Söderberg & Partners

Source: handelsdagarna.sasse.se

An agency problem

The insurance agent, who works for a firm separate from the insurance company but is captive of one insurer, similarly receives a commission on the value and type of products he sells. Judging from history, insurance companies are better off to not delegate the authority to select risks to external parties who will not be held accountable for the underwriting results. To alleviate this agency problem insurers have been experimenting with part-variable commissions contingent on the quality of business the brokers and agents bring in.

Differences in fixed and variable costs

Although the fixed cost of indirect writing is much lower for the insurance company, the variable costs from fees and commissions paid to the brokers and agents are clearly much higher. Hence, when using direct sales channels scale economies and front-loaded investments become more important concepts than with indirect channels.

Bancassurance

Increasingly the distribution capacity of banks is used to sell insurance (so-called bancassurance), either the bank's own or someone else's. Given the competence of bank staff it is mostly savings related life insurance products that are sold through banks. Banks would have limited ability to assist customers with regards to P&C products like car or property insurance. Other types of indirect writing are for example motor insurance sold by car dealerships or home electronics insurance sold by electronics chains.

Online aggregators

In many countries online aggregators have captured a fair part of the sales process for simpler insurance products. These are basically price-comparison sites that charge for click-through's they provide to the insurance companies. The online aggregators sharpen the price pressure and also allow customers to self-select policies that to some extent threaten the role of insurance brokers.

Price pressure

Even though not everybody is buying insurance online the Internet is today the premier source for price discovery especially among younger customers. All this and the low differentiation of insurance products inevitably invite price pressure. A logical conclusion is that efficient cost leaders will succeed better – especially in more commoditized areas like auto insurance.

Long time no see

A basic problem in building customer loyalty in the insurance business is the infrequent interactions between the insurer and the policyholder. In a survey performed by Bain & Co the net promoter score for those insurers who had an interaction with their customers in the last 12 months was between 20 and 40% higher than those who did not have any contact.

Building loyalty

Bain's conclusions from their survey, was in order to build customer loyalty to refine a) marketing campaigns to be more selective in choosing customers, b) to use advanced analytics to improve consideration among less price-sensitive current customer segments to reassure them that "we've got your back", c) to make it easier for people to find all information online, d) to build predictive models that trigger insurance offers due to a life event such as purchasing a house, a car or reaching a specific age and e) to excel in claims handling as this is the moment when an insurer has to deliver its ultimate customer value.

8.3 Property and Casualty Insurance

Property vs casualty

Property insurance gives protection against various risks to tangible property, occurring as for example from fire, flooding, earthquake, theft etc. The property in question could be autos, buildings, ships or other physical items. Casualty insurance is a broader concept and gives protection for the negligent acting and omissions of a person or an organization. Casualty areas include homeowners insurance, auto insurance, professional liability, workers' compensation, general liability and much more.

90% left!

Approximately 1/10 of the Earth's population has purchased some kind of P&C insurance. The US with about 4% of the global population accounts for about 1/3 of the premiums, Europe as a whole with about 10% of the global population for another 1/3 and the remaining 86% of the population for the last 1/3. Outside the US, Germany, China and Japan are the largest national markets.

Auto insurance #1

Auto insurance which is the largest P&C category gives personal injury protection, covers auto damage sustained by the insured and liability to third parties for losses caused by the insured in an accident. Accident and health insurance covers loss by sickness or accidental injury, including disability and workers' compensation covers compensation to employees for work-related injuries regardless of fault (in Europe often covered by the state).

Home insurance #2

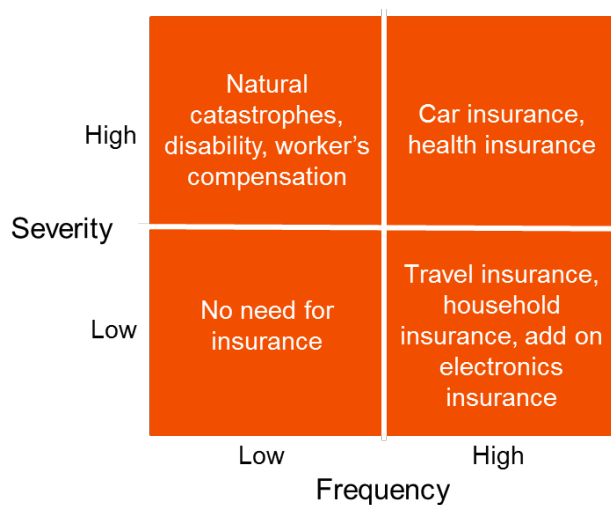
Homeowners insurance which is the second largest P&C category covers houses and other structures on a property, as well as personal possessions inside houses against theft, fire, storms etc. The coverage includes living expenses post incidents and accidental injuries to 3rd parties. Earthquakes and floods are considered "force majeure" and as such they are not included in the contract.

Severity vs frequency

P&C insurance products can be categorized after the impact (severity) and the occurrence (frequency) of the risk they mitigate as shown in the picture below. For risks with low impact that rarely happen there is no need for protection but otherwise insurance products can mitigate the risks. The higher the severity and the more heterogeneous the risk the more volatile the earnings of the insurance company and the more capital required in the business.

Picture 8.7. Categorization of P&C Insurance Products

Low, low: good for you, bad for insurers



Source: The author

Self-insurance

For large corporate entities or public bodies it could be beneficial to be self-insured instead of purchasing protection. The principle method to self-insure is through savings. Those who are self-insured set aside money to finance high frequency type of losses while they often transfer the most severe types of losses to insurers.

GDP – Gross Domestic Product

Drivers

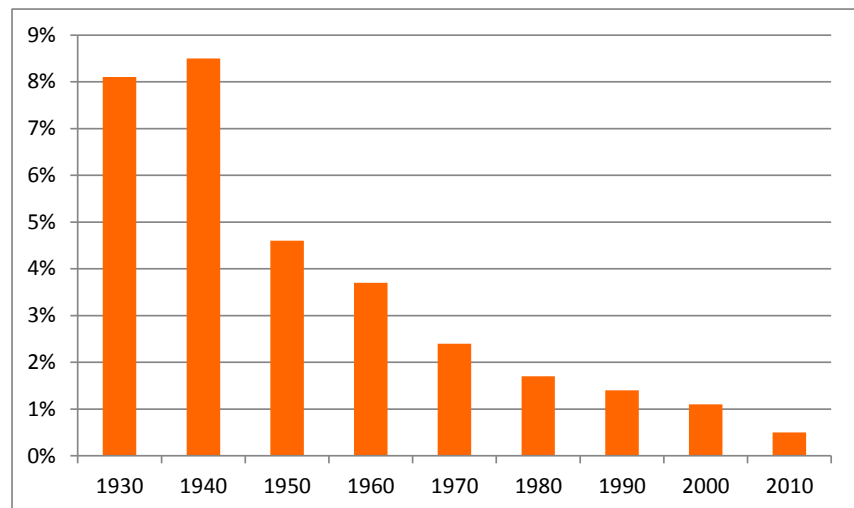
Overall drivers of P&C growth and profitability are GDP growth, insurance premiums per capita (insurance density), insurance premiums per GDP (insurance penetration) and cost related changes in claims cost from inflation or change in severity, litigation trends etc. Developed markets grow in line with nominal GDP around 3-4% as insurance penetration has stagnated. Emerging markets with generally low insurance penetration show faster growth than the nominal GDP growth in these areas.

Autos in focus

With auto insurance being the largest segment, we will cover this area somewhat more in-depth. The number of car thefts has decreased and traveling by car in general has thanks to better technology and “zero-death vision” policies become significantly safer over time as shown by the UK. The number of cars has increased dramatically since the 1940s and up until about 10 years ago the absolute number of accidents still increased. The accidents that still remain have also seen increasing severity.

A dangerous occupation in the 1940s!

Picture 8.8. Annual injuries and deaths in % of total vehicles, UK



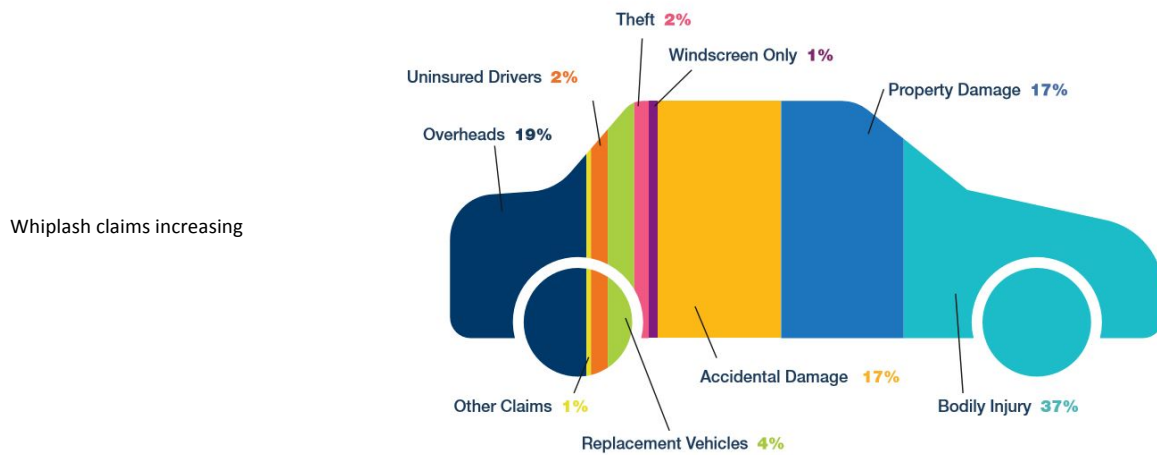
Source: UK Department of Transport

Increasing claims duration

Severe injuries are obviously more costly and with more complex cases with higher stakes the average time to reach settlement has increased. In some instances the case will be settled in court several years after the accident.

As show in the picture below bodily injury is the largest cost item for an auto insurer and it has also grown as a proportion of the total. Within this whiplash claims have been the largest portion the last few years. Repair costs and costs for replacement vehicles during repair in relation to damages are other costly items.

Picture 8.8. What the (UK) premium pays for



Source: Green Flag

In-fault or not?

In every incident one driver is deemed to be the faulty one whose insurance company will be responsible for paying repairs etc. Since no non-faulty driver should have to face the situation where the at-fault driver wasn't insured, third party auto insurance is mandatory in many countries.

Who's first?

The insurer of the faulty driver will want to take control of the process and refer the non-faulty driver to one of its affiliated repair shops and provide a relatively cheap replacement car. The insurance company of the non-faulty driver who isn't paying will want to offer as pleasant experience for its customer as possible and if they get to know about the accident first they will generally recommend more expensive repair and replacement car choices.

Zero profits

The above UK related picture doesn't show a slice called "profits". This is not an oversight as the underwriting profit margin for both auto and home insurance in the UK has hovered around zero since the mid-1990s. Auto insurance is a relatively homogeneous area that has become fairly commoditized in many countries. In the UK price comparison web-sites account for almost 2/3 of all auto insurance sales – creating hugely price conscious customers.

The digitalization with concepts like the Internet of Things (IoT), big data and business analytics has the potential to allow insurers to price specific risks more accurately and by this individualize the price plans for different customers. The often discussed and perhaps most obvious opportunity is the usage of telematics in cars by which monitoring of the driving habits of policy holders would allow for a better granularity in pricing risks (similar to the discounts for no-claims periods).

Digitalization

Further, a potential added benefit could be if the knowledge of the monitoring would result in changed driving habits resulting in fewer road accidents and claims management can be facilitated through the positioning of vehicles lowering fraud. The equally discussed downside is the consequences for personal privacy.

Connectivity through...

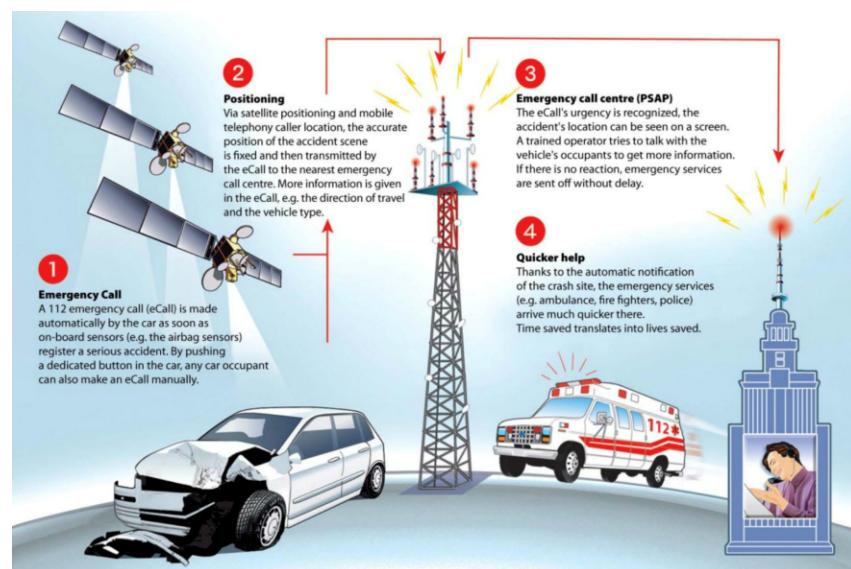
New technology can come to change the auto insurance market. Most new vehicles sold in the western world are now connected on-line by some measure and the cost for separate telematics devices has fallen quickly enabling the connectivity of the older fleet.

...eCall

Since the end of 2015 all new cars sold in the EU must be equipped with an eCall tracking box to allow for automated emergency calls in case of accidents. The usage of various types of automated monitoring devices to allow insurance companies to better price risk could also be applied to areas like irrigation of crops and the maintenance of oil and gas installations.

Picture 8.9. eCall, the EU's Automatic Emergency Call System

Brilliant concept



Source: MAG Ireland

Self-driving cars available on demand...

Other technological developments might not be equally positive for the insurance sector. About 2/3 of auto accidents are the result of poor driver judgement and as such self-driving cars can be highly positive for accident statistics. However, with the potential arrival of self-driving, autonomous vehicles where the ownership also could decouple from individuals and instead transfer to car rental companies, as cars would be ordered when needed, the entire structure of car insurance might change.

...could drive price pressure

In a world where there is only self-driving vehicles accident rate would probably go down substantially lowering the need for insurance and the insurance holder would potentially be a company with a large car fleet guaranteeing very tough B2B price negotiations.

Specialty insurance

Specialty insurance is a sub-category of P&C insurance focused on coverage of rare or unique items and events. These items of events are often excluded from standard insurance policies since their obscure characteristics and complexity makes the risk hard to price. However, many of the risks insured are non-correlated to each other providing a diversification effect. The sector has seen an oversupply of capital and competition hurting profits outside some niches.

Need kidnapping insurance?

The largest specialty line is Marine, followed by Credit and Surety, Directors & Officers and Aviation. Other niches are Energy, Political Risk, Political Violence and Kidnap & Ransom. Surety insurance, offered through surety bonds, covers the losses caused by breach of contract if the counterparty in a business transaction fails to meet its obligations. A large customer is the construction industry.

MAT – Marine, Aviation & Transport

However, the marine, aviation and transit market collectively called the MAT insurance market dominates the space. Marine includes insuring cargos, hulls and liabilities. The area sees quite hard competition from sophisticated mutual, not-for-profit P&I clubs (protection and indemnity) and the profitability of hull insurance has been negative for over two decades with some exceptions.

8.4 Life and Health Insurance

Outliving one's resources; - You mean, like the last week of the month?

Life and health insurance provides protection from quite different types of risk namely protection against outliving one's financial resources, protection against premature death or other unforeseen events like unemployment and protection against poor health and disabilities plus unexpected medical costs due to this. In some countries parts of the unemployment and health insurance protection is publicly administered.

Retirement savings

Life insurance possibly brings to mind taking out an insurance policy on someone's life in an episode of *Midsummer Murders*. While this is one type of life insurance product the absolute bulk of the business is instead a retirement savings product without much detective story appeal. In fact, to an increasing amount life insurance companies sell fee based savings products without any elements of insurance as the customers take all the investment risk and the life insurance industry is clearly a competitor to the mutual fund industry.

The savings products come in a number of design varieties and hybrids but the important ones are:

Pension products

- Traditional
- Unit-linked

- Traditional (or whole life, spread-based, capital life etc.) where the insurer guarantees a minimum return and then shares the surplus above that level with the policyholder. The insurer takes all investment decisions and bears most of the investment risk. The insurer earns money from the spread between returns on invested assets and returns credited to policyholders. Surpluses or deficits can come from results on investment, variation in expense levels or results on risk like mortality (death rates) or lapsation (policyholders discontinuing to pay premiums).

- Unit-linked (or unitized life) where the policyholder decides on the asset allocation through various funds and the payouts depend solely on the result of the investments made. The policyholder bears all the investment risk. The payments end in case of death or end of contract. The insurer earns money from fees charged for managing the policyholders' assets. The fees are normally a percentage based on the market value of those assets.

Fixed or variable

The retirement income products offered gives the policyholder a guaranteed or variable income stream after retirement, normally until the policyholder's death or the death of any direct dependents such as a spouse where one outlives the other. By variable we mean that the payments will vary depending on the returns of the asset portfolios, not that the monthly payments post retirement will vary.

Most retirement income products are constructed like annuities, i.e. a series of payments at regular future intervals (for example monthly post retirement). The stream of payments comes after an initial accumulation period. There are a number of different varieties in the product constructions:

Annuities

- Traditional annuity
- Guaranteed annuity
- Variable annuity

- Traditional annuity provides fixed payments as long as a person is alive – a so-called life-contingent annuity.

- Guaranteed annuity which is a traditional annuity where payouts are guaranteed during a certain period of time (usually 5 to 10 years) even if the policyholder dies before the end of the period.

- Variable annuity where the policyholder decides on how to invest funds in investment vehicles and take the investment risk and where the size of the payout varies depending on the investment

results, but additional guarantees could be added. The guarantees could relate to death benefits, minimum withdrawal levels etc.

Guarantees are marketing weapons

Life insurers on the one hand want to offer as high return guarantees on their products as possible since this attracts new customers and allows the company to take market share. On the other hand they want to offer as low return guarantees as possible since this gives them a possibility to earn a larger spread and produce higher profits.

Insurance vs savings product

When the minimum level of returns is guaranteed and the insurance company takes the market risk the product counts as an insurance product. In contrast, unit-linked products are variable annuities. Since the customer stands the investment risk they are not insurance products and as such regulated by SEC in the US. Still, where the insurance company guarantees a certain death benefit or withdrawal benefit this creates a hybrid savings and insurance product.

From defined benefit to defined contribution

The product trend over the last two decades has been that so-called defined contribution pensions, where the policyholder takes the investment risk has taken share from so-called defined benefit pensions, where the insurance company takes the investment risk. For example, the market share of unit-linked products in the UK has grown from about 30% in the year of 2000 to circa 60% today. This mix shift away from traditional pension insurance products has been much slower in continental Europe.

De-risking insurers but not necessarily efficient

In Sweden the 1999/2003 pension reform in practice changed the public aggregated pension system to a defined contribution system complemented with low guaranteed pension levels.

The shift is de-risking life insurance companies but on a societal level insurance products are more efficient than savings products. When individual persons saves for their own pension they need to have an extra buffer to ensure that they don't run out of money if they turn out to live longer than average. For the average person, who naturally will have a life of average length, this means an over-saving that drags down lifetime consumption. For a large cohort of persons included in a joint insurance solution the law of large numbers will pretty accurately indicate the correct average age and the "unnecessary" savings can be avoided.

Portfolios grow over time

In life insurance a policy can remain in effect for years or even decades. The longer duration claims allows for building up large investment portfolios, that apart from owning interest bearing securities also could be invested in more volatile assets like equities and less liquid assets like real estate, the risk profile of life insurance companies is materially

different from P&C companies.

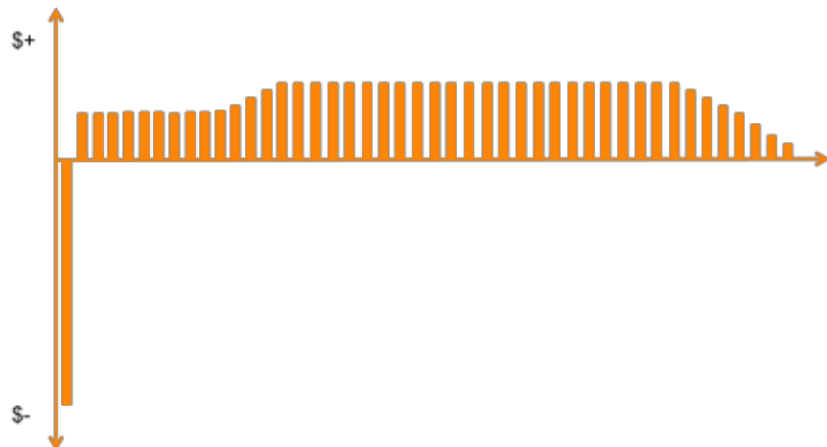
With regards to the cash flow profile, both life and P&C products have initial cash outlays related to acquisition costs, contract handling costs and administration. A typical P&C product also receives an initial upfront premium payment while any payment of claims lies further into the future. Hence, a P&C product is cash flow positive initially and cash flow negative later on. The opposite is true for a life product. There is often no initial lump sum premium payment to counterbalance the acquisition costs and the cash inflows will come yearly from fees and investment spreads over a long period. A life insurer that expands its business quickly will therefore have negative cash flows.

No large upfront inflow

Different pension solutions will have different cash flows. A unit-linked product which is fee based will provide a fairly steady income stream over the coming years. As the fee is a percentage of assets under management, volatility in market values of the assets will cause volatility in the fee income as well.

Unit-linked cash flows

Picture 8.10. Cash flows for a unit-linked product



Painful way to start!

Source: The author

Insurance products require a long accumulation period where premium inflows build up the float during a number of years. These assets plus the compound interest from the asset management over time accumulate to reach sufficient funds to cover a second period of pension payments to the policyholder. A newly started life insurer will in effect be severely underfinanced with regards to the pension promises they guarantee, while a more mature company with a balance of customers in different parts of their life cycle will have a more substantial investment portfolio.

Insurance cash flows

Setting up reserves

In the accounting, reserves will be set up as a liability on the balance sheet when the contract is signed to reflect the expected value of future claims payments to the policyholder. As claims are made in later periods the reserves are released. If the reserves are conservatively calculated the actual claims will be smaller than the reserved amounts, creating a future profit contribution – and vice versa. Conservative reserving leads to higher rating from rating agencies everything else alike but being too conservative, the insurer could risk price himself out of the market.

Risks in taking risk

A number of risks arise from the above products. Guarantees to pay fixed sums as long as someone is alive are exposing the insurer for mortality/longevity risk if whole cohorts live longer than expected. Such guarantees for fixed nominal returns also give a market risk when market interest rates subsequently decline and worst case the spread that the insurer earns his living from turns negative. Changing regulation that changes how products are sold or priced and effects needed capital reserves can also adversely affect the results.

Health insurance

Health insurance is a separate business from life insurance so it is only out of convenience they are lumped together. The insurance principally provides health coverage and related products. The policies supply benefits to insured who become ill or injured. As with all intangible products of any importance for the customer, trust is vital and as noted above health care insurance is in many countries primarily delivered through state run organizations (this often applies to unemployment insurance and life insurance through public pension schemes as well).

Managed care

The most common form of commercial health insurance policy is managed care where insurance companies set up fee agreements with doctors and hospitals (a provider network) to provide health care services. Often managed care health insurance is provided through employment where the employer pays for the plan in advance for its employees.

The employed might - or might not - have to make some form of co-payments in the form of salary deductions or flat charges in relation to received treatment. The contracts are shorter than in life insurance. Being such a small and specialized part of L&H insurance we will not cover health insurance further in this text.

8.5 Reinsurance

The 2nd derivative

Reinsurance is insurance for insurers. Just as their customers insurance companies also face a number of risks including asset risks due to changing prices for securities in the investment portfolios and liability risk due to inadequate pricing or reserving or catastrophic events leading to underwriting losses. Again, this presents insurance companies with a choice to either accept the consequences of those risks, should they materialize, or to try to protect themselves from these consequences and by this reduce the exposure to the various risks.

Ceding companies = the normal insurers

Primary insurance companies, or the so-called ceding companies, protect portions of their risks by purchasing reinsurance from reinsurance companies and by this transfer some of their risks to the reinsurance company. Reinsurers can be classified into P&C, L&H and specialty reinsurance depending on their ceding clients.

Offering global diversification

In parallel to the functionality of regular primary insurance, reinsurers pool and diversify the risks of primary insurance. The higher the diversification affects the higher the return on capital and reinsurers can often offer local insurers global diversification.

Taking care of business

Apart from this role as the insurer of insurers, reinsurance also allows primary insurers to increase the amount of business they can insure. The primary insurer must carry a certain amount of capital in relation to the business risk he takes on to satisfy regulatory and financial market demands. At the same time the primary insurer rarely wants to decline profitable business and might even want to expand and take market share beyond his current capital capacity due to a current business opportunity. By offloading some of the business risk to a reinsurer the ceding insurer can take on the business and still stay within his financial restrictions. The reinsurer in a way lends capital to the insurer.

Counterparty risk

The reinsurer does not step into the place of the primary insurer in its relation to the end customer. The ceding insurer still has to pay the claims as they arise from the original insurance contracts but the reinsurer will later pay the primary insurer to cover some of these outlays. This arrangement creates a counterparty risk for the primary insurer, because if the reinsurer fails to meet its obligations the ceding company will have to shoulder the entire claim. Hence, to be able to compete properly in the reinsurance business the reinsurer has to have a very solid financial situation or else it will gain very few clients.

Lloyd – Welsh name, llwyd, meaning “grey”

Some of the largest reinsurers are Munich Reinsurance, Swiss Re, Hannover Rueckversicherung, Berkshire Hathaway and Lloyds. Lloyds is however perhaps more well-known as a specialist insurer. The company started in 1688 in the Edward Lloyd’s coffee house on Tower Street in the City of London underwriting sea vessels and their cargo. As a specialist insurer you as an underwriter try to price and develop policies for the more unusual risks and Lloyds have a reputation for insuring the oddest of things such as actress Betty Grable’s and riverdancer Michael Flatley’s legs, the comedian Ken Dodd’s teeth, Bruce Springsteen’s and Rod Stewart’s voices and the food critic Egon Ronay’s taste buds.

Picture 8.11. Interior from Edward Lloyd’s Coffee House



Coffee and cargo insurance anyone?

Source: Lloyds website

No limits complexity

Since both primary insurers and reinsurers are in the business of selling risk - transferring financial contracts - and since there is no end-customer consumer rights to protect in-between the two parties, the contracts can in principle be structured any way the parties agree on and they can get fairly complicated. Still, there are a few main types of reinsurance contracts and most of the reinsurance transactions are made in accordance to standardized arrangements. Important types of not mutually exclusive reinsurance contracts are:

- Non-proportional vs proportional agreements
 - In non-proportional agreements (or excess of loss agreements) the ceding company will for example have to cover all claims up until a certain pre-agreed monetary level but nothing above and the reinsurance company covers all claims above the level but nothing below.

Non proportional vs proportional

- In proportional agreements the primary insurer and the reinsurer share the risk proportionally from start. In a so-called quota share agreement they split the premiums and losses on a fixed percentage basis. About 2/3 of P&C reinsurance and nearly all L&H insurance is proportional. In life reinsurance, investment related risks are excluded from the risk transfer.
- Treaty vs facultative arrangements
 - In a treaty arrangement the primary insurer cedes a percent of all risks under a type of policy and not just one particular policy. These arrangements are the major part of the reinsurance business.
 - Facultative reinsurance is instead done on a case-by-case basis. This usually happens where there are individual risks that are so unusual or so large that the primary insurer hasn't got the capability, will or knowledge to take on the risk.

Treaty vs...

...facultative

Longer tailed

Distribution

The 3rd derivative

Less demand...

The typical western-world P&C insurer cedes approximately 5-10% of its gross premium revenues. Apart from receiving a commission from the ceding insurers the reinsurer also earns investment income on the float. Similar to life insurance, reinsurance is often long-tailed with long periods between premium inflows and loss payout, allowing the companies to earn a higher investment income. Compared to P&C insurance the longer duration however also makes them more interest rate sensitive.

While the largest reinsurers rely mostly on direct distribution through their on sales forces, most reinsurers distribute their products through reinsurance brokers who earn a commission or a fee for their services and the customer acquisition costs in the reinsurance business is due to this mostly variable.

Even if it is fairly uncommon reinsurers can, just like primary insurers, use reinsurance for risk management and capital management reasons. The reinsurers for reinsurers are called retrocessional reinsurers (or retro-insurers) and they typically also write regular reinsurance. London is an important retro-market.

The reinsurance industry has faced a number of headwinds the last decade. First primary companies are retaining more risk to save on the fees paid to reinsurers lowering demand. As the larger insurance companies have become larger either by organic growth or through M&A their capacity to withstand losses through internal pooling and diversification has increased and their need for reinsurance then becomes less.

...and more supply

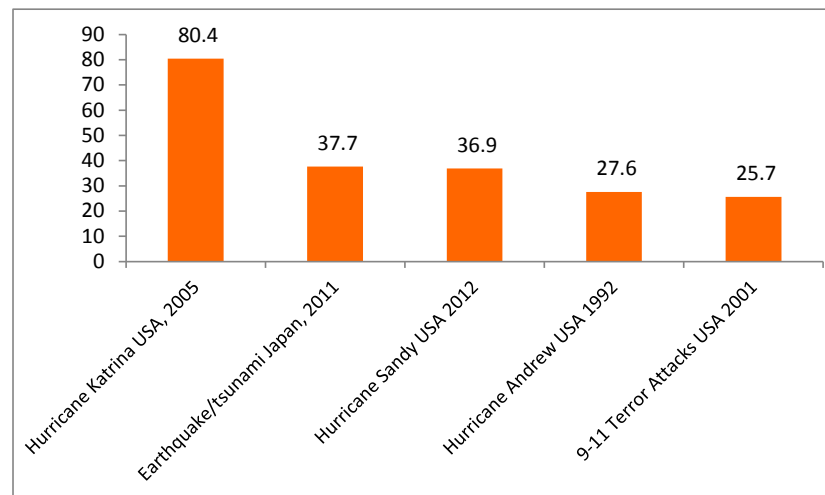
Perhaps more important is the rise of alternative capital engaging in risk transfer increasing reinsurance industry supply. Through standardized legal vehicles hedge funds, private equity firms and other investors have entered into the reinsurance industry as a way to gain returns uncorrelated to their other return streams. According to A.M. Best in 2015 about 18% of global capital dedicated to reinsurance came from alternative, non-traditional capital accounts.

Cat bonds

Further, the issuance of catastrophe bonds (cat bonds) provides a securities-based competition to traditional reinsurance arrangements. An insurance company issues the bonds through an investment bank which are then sold to investors. These bonds usually have maturities less than 3 years. If no catastrophe occurred during that time, the insurance company would pay a coupon to the investors. If a catastrophe did occur, then the principal would be forgiven and the insurance company would use this money to pay their claim-holders.

No coupons this time!

Picture 8.12. Most costly catastrophes, USDb



Source: Swiss Re

CAGR 16%

Cat bonds are generally structured as floating-rate securities where the principal is lost if specified trigger conditions are met. The growing popularity of cat bonds among institutional investors has lowered their yield and by this increased the price pressure on traditional reinsurance arrangements. The 1997 to 2014 CAGR in cat bond issuance in the US was 16%. In all, the inflow of alternative capital has meant a significant deterioration in pricing for certain reinsurance markets and as reinsurers have tried to deploy capital in other areas the intensified competition has spread to more markets.

8.6 Financial Statements

When buying insurance a policyholder pays a premium to the insurer at the start of the coverage period. The insurer settles all administrative expenses, selling expenses and commissions and claims for the accounting period. Further, the insurer creates reserves (often called technical reserves) for potential future claims due to present contracts and adjusts the reserves that were created previous years due to changed assumptions. The above leads to an underwriting profit or underwriting loss. Add to this the investment result and deduct taxes and there you have the profit for the accounting period.

There it is; the P&L

Insurance companies as such maintain a pool of reserves for future expected payments to policyholders. These reserves dominate the liability side of the balance sheet. Every year reserves for claims occurred but not yet paid in that year are added to the pool and existing reserves for claims occurred in previous years are reassessed and by this increased or decreased also affecting the incomes statement. The reserves and capital surpluses (i.e. the shareholders equity) are invested and give an investment result. The investments dominate the asset side of the balance sheet.

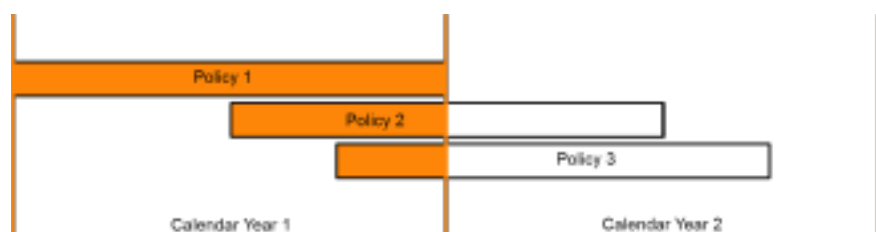
Note that in the insurance business jargon shareholders equity is often simply called capital or sometimes surplus

There are a few definitions when it comes to insurance revenues that are useful to know. There is a distinction made between gross and net premiums, where gross is premiums before reinsurance and net refers to premiums after cession to reinsurers. In order to understand the underlying growth and market share development that in turn drives assets under management and reserves it is preferable to look to gross premium numbers.

Gross and net

The accounting of reinsurance is the direct opposite of the normal insurance contract as ceded premiums are recognized as a cost, which is spread over the life of the contract. Correspondingly, claims are also disclosed in gross and net numbers.

Picture 8.13. Written premiums and earned premiums



Normally earned premiums in calendar year 1 will also include premiums written in earlier years

Source: The author

When an insurer “writes” an insurance policy it means that he has sold an insurance contract where parts of the premiums may be earned this year and parts in later years. Hence, because insurance contracts often are paid upfront but can stretch over several accounting periods there is a difference in written premiums and earned premiums for a specific year.

Written vs earned

The earned premiums for a period only reflect risks covered during the period but will include revenues both from policies written in both previous periods and in the current period. In a growing company the premiums written will be higher than the earnings earned. In the picture above policies 1-3 are written in calendar year 1 while only the colored part of the premiums are earned in that same year.

Accident year

Further, insurers internally discuss results by looking to accident year versus accounting year. The latter is simply the profitability of a specific year using official accrual accounting. The accident year instead looks to the profitability of a year by comparing written premium income and all resulting future claims from that year’s business including those expected in later years.

The Income Statement

Sampo = If + Mandatum + Nordea

Below we show the income statement of Sampo for the year of 2015. The main business of Sampo is P&C insurance under the brand “If” but they also have a substantial life insurance business in Mandatum and they held a 21.2% equity stake in the bank Nordea.

Ceding EUR 181m

In line a) below we have the insurance premiums written. The EUR 5,522m are made up of EUR 4,344m of total P&C insurance premiums earned and EUR 1,144m life insurance net premiums written. From the gross premiums written in the P&C business a EUR 181m deduction for reinsurers’ share of premiums written is deducted to receive a net amount of written premiums. This net amount is then lowered with a net amount of EUR 34m for changes in unearned premium provisions and with this we arrive at the P&C premiums earned.

Change in earned premium provisions = increasing volume of future business

The change in unearned premiums represents an increase of premiums that have been written but are yet to be earned in future periods and as such not recognized as revenue in this period. This will increase the liability unearned premiums. The dominating P&C products for Sampo were fire insurance and other motor insurance where the latter was the more profitable one while third party motor insurance made a loss.

In comparison the reinsured part in the life business is very small and the premiums written are made up of EUR 720m net insurance contracts written and EUR 424m investment contracts written (i.e. the savings products).

Picture 8.14. 2015 Income Statement of Sampo

	EURm	1-12/2015	
	Insurance premiums written	5,522	a
	Net income from investments	998	b
	Other operating income	46	c
	Claims incurred	-3,917	d
"Income" = a + b + c = EUR 6,566m	Changes in liabilities for insurance and investment contracts	-502	e
	Staff costs	-438	f
	Other operating expenses	-545	g
	Finance costs	-68	h
	Share of associates' profit/loss	793	i
	Profit before taxes	1,888	j
	Taxes	-232	k
	Profit for the period	1,656	l
	Other comprehensive income for the period		
	Items reclassifiable to profit or loss		
	Exchange differences	-35	m
	Available-for-sale financial assets	-106	n
Unrealized result on available-for-sale securities	Share of associates' other comprehensive income	16	o
	Taxes	21	p
	Total items reclassifiable to profit or loss, net of tax	-103	q
	Items not reclassifiable to profit or loss		
	Actuarial gains and losses from defined pension plans	14	r
	Taxes	-3	s
	Total items not reclassifiable to profit or loss, net of tax	11	t
	Total comprehensive income for the financial year	1,564	u

Source: Sampo Group, Annual Report 2015

The amounts on line c) are too small to warrant a note in Sampo's annual report but it could relate to other types of fee income that for some companies are more important. Some insurers offer consulting/advisory services and other ancillary "add-on" services such as recommendations of workshops for damaged motor vehicles that are rewarded by fees from the workshop.

Moving on to line d) claims incurred, we notice the dominating cost item of EUR 3,917m. There are quite a few moving parts in this number and incurred losses can come in two forms: paid claims or establishing a loss reserve to pay claims in the future.

IBNR – Incurred but not reported

If we start with the P&C business we first have the claims cost attributable to the current year operations where (net of reinsurance) EUR 1,590m of claims were paid. Then there were changes in provisions for claims outstanding of EUR 672m for incurred and reported losses plus EUR 562m for incurred but not reported losses (IBNR). The total P&C claims for 2015 was EUR 2,833m. As we noticed above, any period's accounting numbers is made up of the consequences of both insurance policies written in the same period and of those written in earlier periods.

Don't worry there is a picture below to clarify

We then continue with claim costs attributable to prior-year operations. EUR 966m of claims were paid but the almost equivalent sum of changes in provisions for claims outstanding (reported and not reported) constituted a positive cost giving a total cost of only EUR 61m. Finally in the P&C business provisions are revalued giving rise to changes in provisions for claims outstanding, incurred and reported losses, of EUR 62m and incurred but not reported losses of EUR 131m. With a few posts we haven't mentioned the claims incurred of the P&C business were EUR 2,894m net of reinsurance.

P&C: only reserves for occurred events at balance sheet day, not for expected future claims

Before we proceed further to the claims incurred in the life insurance business we must take a step back to understand all the above-discussed changes in provisions. Claims incurred equals claims paid plus change in claims reserves (outgoing balance minus ingoing balance for the liability claims reserves). The reserves are for estimated claims related to insured events that have occurred at the balance sheet date.

IBNR – things that are expected to already have happened

The distinction between incurred and reported losses versus incurred but not reported losses (IBNR) is that in the first case the policyholder has made a claim but it has not yet been settled and in the other case the insurance company prepares itself for the fact that at the balance sheet day there will have been a number of insurable events in the latter part of the year where the policyholders have not yet made their claims and they are as such not yet reported to the insurance company. The insurance company instead tries to estimate how big these losses might become.

Note 3, the savior

We have included note 3 from Sampo's 2015 annual report to try to make some sense of it all. If we add the total claims cost for the two years, EUR 2,833m and EUR 61m in the upper part of the table, it adds up to EUR 2,894m. In the lower part of the table the same sum is arrived at by adding both years' claims paid to the change in claims reserves.

Picture 8.15. Note 3, Claims incurred, P&C Insurance

EURm, Claims incurred, P&C insurance, net of reinsurance	1-12/2015
Claims cost attributable to current-year operations	
Claims paid	-1,590
Change in provision for claims outstanding (incurred & reported losses)	-672
Change in provision for claims outstanding (incurred but not reported losses, IBNR)	-562
Claims-adjustment costs	-8
Change in claims provisions for annuities	-1
Total claims cost attributable to current-year operations	-2,833
Claims cost attributable to prior-year operations	
Claims paid	-966
Annuities paid	-204
Change in provision for claims outstanding (incurred & reported losses)	609
Change in provision for claims outstanding (incurred but not reported losses, IBNR)	500
Total claims cost attributable to prior-year operations	-61
Insurance claims paid	
Claims paid	-2,557
Annuities paid	-132
Total claims paid	-2,689
Change in provisions for claims outstanding	
Change in provision for claims outstanding (incurred & reported losses)	-62
Change in provision for claims outstanding (incurred but not reported losses, IBNR)	-131
Change in provision for annuities	-11
Claims-adjusted costs	-1
Total change in provision for claims outstanding	-205
P&C insurance, total	-2,894

This is only for P&C...

Source: Sampo Group, Annual Report 2015

...and then for life

The claims incurred in the life insurance business of EUR 1,023m were made up of EUR 666m of costs for insurance contracts net of reinsurers' share of EUR 3m and claims for unit-linked contracts of EUR 358m. Together the claims of the P&C and the life business then sum up to EUR 3,917m and we are finally done with line d).

Investment income

Next we take on line b) called Net income from investments that simply is the investment income and realized investment gains/losses of EUR 304m in the P&C business If, of EUR 632m in the life business Mandatum and EUR 76m in the holding company, summing up to EUR 998m. The longer duration of the life business and the subsequently larger dependence on investment income is clearly visible.

Life insurers' reserves include future expected claims

Line e), Change in liabilities for insurance and investment contracts, is mainly addition to reserves for policyholders' future benefits in Mandatum. About 70% of the changes in the life business referred to insurance contracts and 30% to investment contracts without an insurance component.

Salaries, IT and other expenses

Working our way downward, line f) are salaries, bonuses, pension costs and social security costs. The P&C business stood for 85% of the costs, the life business for 11% and the holding company for the rest. Among the main items in Other operating expenses in line g) we find IT costs and direct insurance commissions for If. The latter is commissions to

the internal sales force for writing policies.

DAC – Deferred acquisition cost

Included in g) is also a very small post called Change in deferred acquisition costs (DAC). Customer acquisition costs are significant and for many other insurance companies especially in life insurance DAC is a major asset on the balance sheet and capitalized customer acquisition costs paid up-front are amortized over the life of the insurance policy to match the future premium payments.

Nordea, but also Topdanmark

The Share of associates' profit/loss in line i) of EUR 793m obviously mostly relates to Sampo's 21% ownership of Nordea but also to a 30% ownership in Topdanmark A/S and holdings in a few other much smaller businesses. With that we leave the direct run-through of Sampo's income statement but note how most of non-realized valuation changes of available-for-sale financial assets for Sampo are recognized over the statement of other comprehensive income rather than over the income statement.

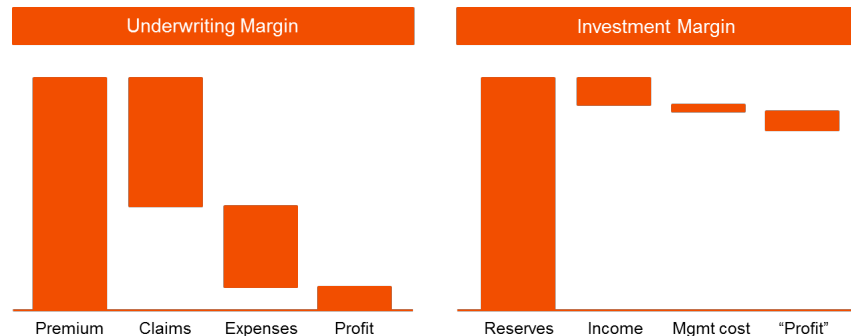
Cost+, minus discounts

Most insurance companies use a cost plus approach to their underwriting pricing, that is they calculate a technical price of an insurance contract by backing out the premium that is needed to reach a target profit margin on top of expected claims and expenses. From this they at times give discounts to be able to take market share hoping that the investment result will fill in the gaps meanwhile.

Picture 8.16. Underwriting Margin and Investment Margin

Underwriting margin = profit/premium

Investment margin = "profit"/reserves



Source: The author, The profit in the investment business is within quotation marks due to the fact that some of the investment returns will be paid to policyholders and some will be kept by the insurer. The investment margin calculation in the picture uses "reserves" instead of the full asset portfolio since some of the assets belong to the insurance company.

The only way...

There are only so many ways to improve profit margins and the main ones come from lower distribution and/or admin costs that each could account for up to 15% of the premium income. To some extent better pricing capabilities can increase premiums but often insurance products are under heavy competition making differentiated pricing hard.

In the few cases where an insurance company can claim and edge in investment management over their competitors this will lead to higher profits or an ability to set lower prices in the underwriting business to take market share. Even though differences in investment skill can be hard to build a business around, a strong balance sheet that allows the insurer freedom to invest without constraints can be a clear competitive advantage in life insurance.

...is up?

Further, it is probably fair to say that underwriting margins are generally understated and investment income overstated as underwriting claims are reported on and undiscounted basis and the policyholders' potential share of investment income is not separated out from the investment income. We now arrive at some of the most commonly used industry specific financial ratios for analyzing the profitability of insurance companies.

	Risk ratio for P&C insurance, % + claims incurred - claims settlement expenses ----- insurance premiums earned	X 100%
	Cost ratio for P&C insurance, % + operating expenses + claims settlement expenses ----- insurance premiums earned	X 100%
For P&C Insurance:		
Loss ratio		
+		
Expense ratio		
=		
Combined ratio		
	Loss ratio for P&C insurance, % + claims incurred including claims settlement expenses ----- insurance premiums earned	X 100%
	Expense ratio for P&C insurance, % + operating expenses ----- insurance premiums earned	X 100%
	Combined ratio for P&C insurance, % + claims incurred including claims settlement expenses + operating expenses ----- insurance premiums earned	X 100%
	Expense ratio for life insurance, % + operating expenses before change in deferred acquisition costs + claims settlement expenses ----- expense charges	X 100%

The combined ratio sums the loss ratio and the expense ratio and mirrors the underwriting margin. If premiums are 100, claims 60 and expenses 30, then the combined ratio is $(60+30)/100 = 90\%$, while the loss ratio is $60/100 = 60\%$ and the expense ratio is $30/100 = 30\%$. Hence, somewhat counterintuitive, a combined ratio over 100% says that the underwriting business is making losses that the investment income hopefully can make up for, or else the entire company will be in the red.

Below 100% = good

Net ratios

By subtracting claims settlement expenses the risk ratio measures how well the insurance company has priced underwriting risk. All these profitability ratios are generally reported net of any reinsurance. Naturally expenses and claims can be broken down in sub-categories and set in relation to premiums to gain further granularity. Expenses are generally about 50/50 admin costs and distribution costs and it is

often constructive to strip out one-off types of catastrophe losses from claims.

Sampo's targets

The Financial targets for Sampo 2015 were that It should have a RoE of at least 17.5% (realized 21.5%) and a combined ratio below 95% (85%) and that Mandatum were to have a RoE of the same 17.5% (realized 12.7%).

An expensive hobby

Often insurance companies to remain competitive in the market place have a combined ratio around 100% and instead live out of the, unfortunately volatile, investment result. Between the years 2000 and 2014 US P&C insurers had an average combined ratio of 103% - the industry's entire profit and then some came from the investment results. Indeed, there is a saying that "insurers are merely investment trusts with an expensive hobby". With lower interest rates levels there has however been a renewed focus on actually making an underwriting profit.

The Balance Sheet

Start with liabilities

We are now ready to have a closer look at the balance sheet of Sampo, as pictured below, and as it is more illuminating we will cover the major liabilities before moving on to the assets.

P&C reserves undiscounted

Insurance liabilities represent technical reserves for estimated insurance losses from either P&C or life policies. Life reserves are accounted for a discounted basis while P&C reserves are undiscounted. P&C reserves can only reflect losses that have actually been incurred, i.e. they cannot be anticipated in the beginning of the contract, and instead they are accounted for when a claim is made.

Life reserves are discounted

In contrast, life reserves – expected future payouts of savings - are calculated using actuarial techniques that use assumptions around interest rates, mortality, lapses (termination of policies due to missed premium payments) and expenses to estimate a liability arising from signing the contract. Given the long duration of contracts all assumptions should be conservative. The assumptions are then locked for the lifetime of the policy unless severe deviations call for adjustments. What the original assumptions were and how or if insurance companies subsequently adjust for changes in interest rates etc. are generally not well disclosed which makes life reserve numbers less reliable and comparable.

Picture 8.17. Balance Sheet of Sampo per Dec 31, 2015

	EURm	12/2015	
	Assets		
	Property, plant and equipment	26	a
	Investment property	191	b
	Intangible assets	724	c
	Investment in associates	7,679	d
	Financial assets	17,189	e
A securities portfolio to cover...	Investment related to unit-linked insurance liabilities	5,847	f
	Tax assets	36	g
	Reinsurers' share of insurance liabilities	242	h
	Other assets	1,708	i
	Cash and cash equivalents	1,997	j
	Total assets	35,639	k
	Liabilities		
	Liabilities for insurance and investment contracts	14,447	l
	Liabilities for unit-linked insurance and investment contracts	5,841	m
...future claim payments	Financial liabilities	2,375	n
	Tax liabilities	468	o
	Provisions	51	p
	Employee benefits	90	q
	Other liabilities	957	r
	Total liabilities	24,228	s
	Equity		
	Share capital	98	t
	Reserves	1,531	u
	Retained earnings	9,325	v
	Other components of equity	457	w
	Total equity	11,411	x
Solid position	Total equity and liabilities	35,639	y

Source: Sampo Group, Annual Report 2015

We start with line l) called Liabilities for insurance and investment contracts amounting to EUR 14,447m (about 60% of all liabilities) of which about 2/3 relate to the P&C business and 1/3 to the life business.

Unearned premiums plus provisions for claims outstanding

Starting with the P&C insurance part EUR 2,017m is provisions for unearned premiums. Unearned premiums represent premiums that have been written but will be earned and accrued in a future accounting period. Then EUR 7,416m are mainly provisions for incurred claims outstanding (reported or not), i.e. expected payments to settle made claims. Similarly, in the life business EUR 2,552m are also provisions for unearned premiums and EUR 2,462m provisions for claims outstanding.

What Sampo jointly calls provisions for (incurred) claims outstanding in P&C and life will in other P&C businesses often be called "loss reserve" and in other life businesses "liability for policy and contract claims" to accentuate the difference in their character. There is an amount of discretion involved in the accounting of claims reserves.

Unit-linked funds on both the debit and credit side

Liabilities from unit-linked insurance and investment contracts constituting line m) has a sibling post in line f) Investment related to unit-linked insurance liabilities. The posts relate to the non-insurance related parts of unit-linked insurance contracts and to the unit-linked investment contracts, i.e. to banking-like savings products where the policyholder stands the investment risk as opposed to Sampo. The invested assets belong to the customers but as they are accounted for as an asset for Sampo they have a corresponding liability. In a way these separate account posts inflate the balance sheet of life insurance companies lowering the equity ratio.

Small reinsurance volume

The only remaining liability of size, line n) called Financial liabilities, relates to a bond issued by the holding company and is as such not related to the underlying insurance businesses. Included in line r) Other liabilities are liabilities arising out of reinsurance operations. These premiums represent deposits received by reinsurers. However, Sampo only uses reinsurance to a very limited extent.

Financial assets

We turn to the assets on Sampo's balance sheet. The dominating asset is shown in line e) Financial assets of EUR 17,189m. Insurance companies hold investments to generate a return on paid-in premiums in addition to the underwriting margin. The accounting of the financial assets is dependent on how they are categorized and this decides if gains and losses are recognized in earnings or equity.

Available-for-sale -> mark-to-market and unrealized results over OCI, not P&L

In the sum EUR 10,437m were available-for-sale assets (as opposed to trading assets or held-to-maturity assets) in the P&C business and EUR 5,956m available-for-sale assets in the life business. As such these financial assets must be recorded in the balance sheet at fair value and unrealized gains or losses from market price changes are reported in the statement of comprehensive income. For some assets there are no fair market values and instead models are used for their valuation.

Sampo: 74% bonds, 12% "cash" and 14% equities

The investment allocation at the end of 2015 was 74% fixed income, 12% money market and 13% equities (with Swedbank as the second largest holding at the time). The asset allocation mix for insurers start with asset-liability management calculations and often means that they hold a large proportion fixed income. One benefit of the asset-liability matching in insurance companies is that they are seldom forced to sell securities in stock market drawdowns.

Average European insurer post GFC: 81% FI, 8% equities & 10% other

Nordea holding

However, with a strong balance sheet the flexibility increases to own other types of assets and Sampo has had more equity assets than most other listed European insurers which has served the company well. Finally the EUR 7,679m of Investment in associates in line d) to 95% consists of the carrying amount of the holding in Nordea and most of

the rest to the holding in Topdanmark.

Equity ratio of 34%

The shareholders' equity of an insurer is pretty much the same as for most companies. The one difference is the importance of net unrealized results on investments, which captures the marked-to-market changes in the investment portfolio. With a share capital of only EUR 98m for Sampo but a total equity of EUR 11,411m the equity ratio was 32%, a far distance from the perhaps 5% held by a bank.

P&C > Life

In general P&C insurers and reinsurers usually have equity ratios of about 25%, while L&H insurers are at 10% or below. Hence, Sampo had a strong financial position. P&C insurers mainly focus on taking risk in the underwriting business instead of on the balance sheet and reinsurers have higher exposure to catastrophic losses so they need the buffers.

Solvency ratio

In mutual life insurance companies there is a factor called collective consolidation ratio that is insurance assets divided by guaranteed plus non-guaranteed claims. Related to this is another "solvency ratio" that is the assets divided with guaranteed claims

To measure the adequacy of the equity cushion insurance companies more often look to the measure solvency ratio than an equity ratio. In 2015 Sampo had a group solvency ratio of 193%. The relation shows the amount of capital available for Sampo divided by the minimum requirements of available capital and as such resembles the capital adequacy ratios for banks. The numerator called Group's own funds is an adjusted group capital number where for example intangibles have been deducted. The denominator called Minimum requirements for own funds was in 2015 calculated using internal capital models in accordance with the Solvency II regulations.

Premiums-to-surplus

Another ratio that tries to assess the balance sheet strength is the premiums-to-surplus ratio, which is the revenues divided by the shareholders' equity in non-insurance speak. The lower the ratio the better the company is capitalized. The reasoning behind the ratio is that insurers need a certain capital buffer for all the business they take on.

To sum up the accounts we show stylized income statements and balance sheets for P&C, L&H and reinsurance with data collected for the US market 1999 to 2009.

Picture 8.18. Income statements and balance sheets

	Income Statement			Balance Sheet		
	P&C	L&H	Re	P&C	L&H	Re
Insurance premium	71%	54%	86%	Cash	3%	2%
Investment income	11%	35%	14%	Investment assets	62%	57%
Fee income	5%	12%	0%	Accounts receivable	6%	1%
Realized inv. gains/losses	1%	-2%	0%	Reinsurance assets	9%	2%
Other revenue	12%	1%	0%	Intangibles	4%	1%
Total revenue	100%	100%	100%	Deferred acq. Cost	2%	4%
Benefit & claims	51%	59%	64%	Seperate account assets	2%	28%
Amortization of DAC	10%	4%	11%	Other assets	12%	5%
Other operating expenses	26%	24%	13%	Total assets	100%	100%
Investment expense	0%	2%	1%	Insurance reserves	45%	53%
Interest expense	2%	2%	1%	Unearned premiums	9%	0%
Total expenses	89%	91%	90%	Reinsurance liabilities	1%	0%
Profit before tax	11%	9%	10%	Debt	9%	5%
Income taxes	3%	2%	2%	Separare acc. liabilities	2%	28%
Minorities etc.	0%	1%	0%	Other liabilities	9%	7%
Net income	8%	6%	8%	Minorities etc.	1%	0%
				Common equity	24%	7%
				Liabilities and equity	100%	100%

Average of US insurers 1999-2009

Source: Nissim, Doron – Analysis and Valuation of Insurance Companies, 2010, Columbia University

Before we leave the financial accounts we want to dig deeper into the issue of reserve values that dominate the liabilities in the picture above. Small differences in the treatment of reserves could cause large shifts if the income statement and the single most frequent cause of problems for insurers is the inadequacy of loss reserves. The most common reason for the inadequacy is however not the practice of letting reserves support profits by relaxing reserve practices but an underestimation of the inflation development of the claims.

A closer look at reserves

As we noted above, insurance companies are meant to account for reserves conservatively meaning that estimated reserves tend to be higher than claims ultimately paid. When so, this result in reserve releases in the years after the policy has been written and claims expenses in any given year include both claims paid and changes to reserves for the period. Hence, reserve releases reduce claims expenses and increase profits. For an analyst it will be important to have an opinion on the quality of the earnings presented by the company.

Claims releases improve profits

One often-used rough check up on the reserve strength is to plot a time series of the historic ratio of net technical reserves over net written premiums per year. When a company is growing, a flat or declining development for the reserves should spark questions as to why. The explanation can be a drop in claims inflation or other improving claims patterns but you want to look management in the eyes when they tell you the reason.

Reserves/premiums

Loss triangle

Otherwise, the main tool to analyze the risk level in reserves is the so-called loss triangle or reserve triangle as shown in the picture below. One way to use the triangle is to look at total cumulative change by accident year. For example in 2006 Sampo estimated that the claims against premiums written would be EUR 2,390m. Nine years later the estimate has gone down to EUR 2,182m, i.e. thanks to conservative initial assumptions, it has shrunk with an accumulated EUR 208m or 8.7% compared to the original estimate.

On average conservative

Looking at the loss triangle we can conclude that Sampo has been reasonably good in estimating losses and with a total net run-off of EUR 687m they have also been prudent. However, for the years 2011-2013 (where it's admittedly still early days) the net is positive – Sampo has had to increase the reserves. If a company habitually over time increases its reserves it could be a sign of aggressive reserve handling where costs are pushed forward in time to boost short-term earnings.

Picture 8.19. Loss triangle for Sampo (post reinsurance)

Got carried away 2011-2013?

EURm	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Totals
At close of year	11315	2390	2459	2561	2567	2654	2721	2725	2768	2763	2783	
One year later	-0.5%	-1.2%	-0.4%	-1.1%	-1.2%	1.8%	2.6%	-0.6%	1.0%	-0.4%		
Two years later	-0.9%	-2.3%	-1.5%	-3.2%	-2.4%	0.2%	2.2%	0.0%	1.0%			
Three years later	-1.3%	-2.2%	-2.8%	-4.3%	-3.4%	0.0%	2.0%	0.1%				
Four years later	-1.6%	-3.7%	-4.6%	-5.0%	-4.1%	-0.2%	1.1%					
Five years later	-1.2%	-5.5%	-5.5%	-5.5%	-5.0%	-0.1%						
Six years later	-1.4%	-6.6%	-5.8%	-6.2%	-4.9%							
Seven years later	-1.9%	-7.0%	-6.3%	-6.1%								
Eight years later	-1.8%	-7.4%	-6.3%									
Nine years later	-1.6%	-8.7%										
Ten years later	-0.8%											
Net run-off	-90	-208	-156	-155	-125	-2	30	2	28	-11	0	-68
Change 2015	86	-32	-1	3	3	3	-24	1	-1	-11	0	2

Source: Sampo Group, Annual Report 2015

The reserve cycle

It is useful to create a graph picturing the percentage yearly change of each accident year to quickly visualize if anything stands out. The analysis of the reserves in the triangle can be expanded in numerous ways. The reserves or the incurred losses can be looked at as a percentage of premiums and so on.

The insurance sector consultancy A.M. Best has shown that there has been a clear cyclical aggregated pattern of reserve changes in the US that they call "the reserve cycle". Aggressive pricing periods lead to later periods of upwards revisions of reserves to bring the reserve values better in line with reality.

8.7 Capital Requirements

Strong financial situation and don't abuse clients

Regulation of the insurance sector usually focuses on solvency concerns and information asymmetries between insurance companies and policyholders. We will concentrate on the former issue and the capital requirements in the sector, but MiFID2 could become a big factor in how insurance services are marketed and sold to consumers.

No common rules

Global regulatory convergence has yet to materialize within the insurance sector so insurers operate under a diverse set of regional and national regulations. In Europe for example insurers since 2016 comply with both a EU-regulation called Solvency II and national regulation while Switzerland with a number of large insurance companies only use their national laws (which however are similar to the Solvency II regime).

RBC – Risk Based Capital

In the US insurers use a framework called Risk-based capital (RBC) and the regulator is mainly state based commissioners, not the federal body NAIC (National Association of Insurance Commissioners). In some states the commissioners are elected officials making them quite vigilant in advocating low insurance pricing.

Life – market risk

P&C – insurance risk

The main risks in the insurance business are credit risk, market risk, insurance risk and operational risk and although they are the same for all, life companies' risk exposure is dominated by market risks like interest risk, spread risks and equity risk while P&C companies' risks are dominated by insurance risks like premium risk (underpricing of future claims), reserve risk (incorrect previous reserves) and natural catastrophe risks. The mix change in the life insurance sector from traditional life insurance products to unit-linked savings products has lowered the risks in the life sector as much of the market risk has been transferred to the customers.

Capital required to conduct business

To some extent the balance sheet handling of insurance companies resembles the one in banks. The leverage is lower for the insurers (about 10:1 for life and 5:1 for PC) but as the balancing act between using resources to drive business expansion versus the need to keep spare capital to limit the probability of financial difficulties during a time period to a set level is the same.

Both sides in flux

Therefore, just as in bank regulation factors like market, credit and operational risks are reflected in risk based minimum capital regulations. However, as we have seen above the balance sheets of insurance companies are more complex than those of banks as both the asset side containing asset portfolios that constantly vary in fair values and the liability side with present values of uncertain future

obligations.

Internal models

Exactly as in banks, the risk management departments at insurance companies run internal models that reflect their view on how to best model risk and take risk to earn a satisfactory result. Such internal models are also allowed under the current Solvency II reporting.

Solvency II = BBB...

... but more is required

In contrast to banks, the ultimate setter of capital constraints in the insurance sector is not the regulators but the rating agencies that in effect demand more stringent requirements on capital levels - if the insurer is to be given a satisfactory rating level. And insurance companies need a strong rating to stay in business – especially within commercial line insurance and reinsurance. Solvency II roughly requires companies to be the equivalent of BBB-rated while insurers strive for A to AA-levels (and reinsurers AA to AAA). Further, as rating agencies like S&P and Moody’s employ the same methodology globally they work to harmonize the capital management internationally.

Picture 8.20. Required positions from regulators vs rating agencies

Reinsurers need a rock-solid position

Moody's		S&P		Fitch		Description		
Long-term	Short-term	Long-term	Short-term	Long-term	Short-term			
Aaa		AAA		AAA		Prime		
Aa1		AA+	A-1+	AA+	F1+	High grade	Investment-grade	Reinsurers
Aa2		AA		AA				
Aa3	P-1	AA-		AA-				
A1		A+	A-1	A+	F1	Upper medium grade	Investment-grade	Insurers
A2		A		A				
A3		A-		A-				
Baa1	P-2	BBB+	A-2	BBB+	F2	Lower medium grade		Solvency II
Baa2		BBB	A-3	BBB	F3			
Baa3	P-3	BBB-		BBB-				
Ba1		BB+		BB+		Speculative		
Ba2		BB		BB				
Ba3		BB-	B	BB-	B			
B1		B+		B+		Highly speculative		
B2		B		B				
B3		B-		B-				
Caa1		CCC+		CCC		Substantial risks	Non-investment grade	
Caa2	Not prime	CCC	C		C			
Caa3		CCC-						
Ca		CC				Extremely speculative Default imminent with little prospect for recovery		
C		C						
/		D	/	DDD	/	In default		
				DD				
				D				

Source: Wikipedia

Capital management

The capital management process of the insurers then concerns the risk/reward business management of the capital buffers available beyond those that are required by the regulators and the rating agencies. Above we noted that Sampo’s 2015 solvency ratio was 193%. That number refers to the amount of available capital in relation to the required capital amount in accordance with the Solvency II regulations. In banks the CET1 ratio is a type of equity ratio (assets divided by equity). The solvency ratio is instead a type of inverted equity ratio.

Sampo's way

In other words Sampo's balance sheet had ample buffers to satisfy both the regulators, the rating agencies and give some flexibility with regards to exploiting business opportunities. Sampo expresses their policy as that they first must have a capital at the highest of the regulatory requirement and the requirement to satisfy a chosen rating target. On top of this they need a buffer and factors affecting this are "expected profits and market values, business growth prospects and capacity to issue capital instruments".

Pulling in different directions

There are a number of stakeholders in capital management decisions. The insurer often wants to have funds for business expansion, while the regulator would prefer the insurer to stay small and conservatively financed. The investor and owner of the insurance company want capital to be efficiently deployed to generate high returns but without taking too much risk, while the policyholder naturally wants to see a balance sheet that is as strong as possible.

Surviving 199 years out of 200

The amount of capital needed is the sum that would withstand the losses of an adverse scenario. The methodology to estimate risks and decide the amount of required capital differs somewhat between rating agencies and regulators.

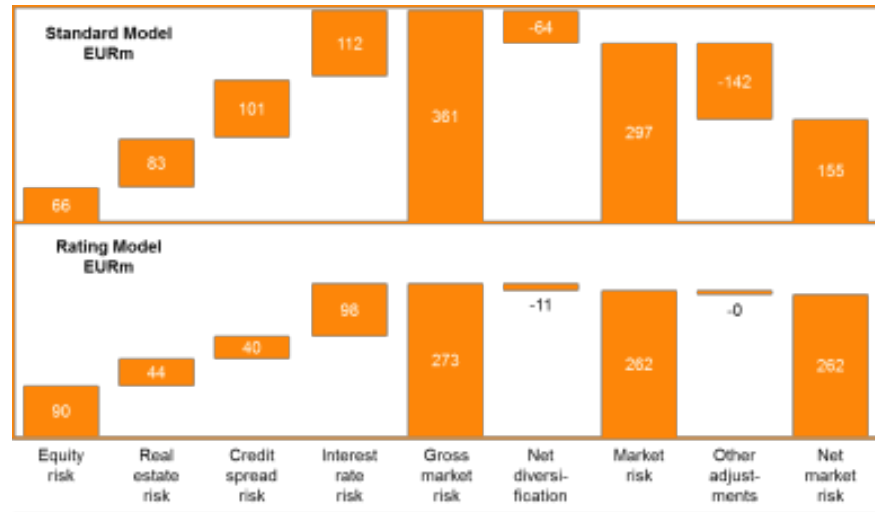
The rating agencies use simulations in factor-based models. By looking to historic results including changing market values of assets and liabilities and correlations between the risk factors, i.e. by performing a type of VaR-calculation, the requirement is set so that the insurance company is expected to withstand a 99.5% one year VaR-level or all bad things that the world can throw at the company in 199 years of 200, and still prevent insolvency.

When calculating the individual risk factors' contribution to the overall risk the regulatory model is relatively similar to the rating model. The required capital amounts arising from the individual risks are added together to a gross sum.

Rating agencies' cautions on diversification

The regulatory model might even be a bit harsher than the rating model at this stage. However, then the regulatory model makes larger deductions for diversification effects etc. and the required net capital sum by the rating agency will be larger. Further, if the diversified insurer uses internal models within the Solvency II requirements it is allowed to factor in diversification benefits between the life and P&C divisions as well.

Picture 8.21. Example of capital requirements of Solvency II and rating agencies



Schematic example

Source: Dr. Dirk Hoering

Over 100% market risk

Within Sampo, the P&C business If saw 47% of its solvency capital requirement coming from market risk and 66% from insurance risk. The life insurance business Mandatum saw 118% of its requirements from market risk and 29% from insurance risk. The numbers are before the diversification benefit deductions so they sum to more than 100%. In calculating market risk Solvency II assigns no risk weight to EU government bonds, while listed OECD equities incur a 39% charge. With the credit quality of EU sovereigns this might change post the 2021 regulatory review.

Solvency II using fair values

A solvency ratio is a ratio between available capital and the above pictured required capital (“net market risk”). Hence, what constitutes the allowed available capital is also of importance in the calculation. At the most basic level capital is obviously assets minus liabilities. The big novelty of Solvency II compared to Solvency I was that the new framework uses market based fair values for assets and liabilities.

Interest rate risk

Solvency II allows 100% of the present value of future life profits to be included into the calculation while the rating agencies apply a haircut of 50% as it is unlikely that a distressed company could sell these expected future cash flows at par. Again, the rating agencies set a tougher standard.

Not taking all required regulatory adjustments into account, capital is (market based) assets minus (market based) liabilities. In life insurance the liabilities are to a large extent reserves for contract and policy claims. When setting aside these reserves the future claims were discounted with a capital cost.

Hence, if the market yields subsequently go down, the cost of capital also goes down and the size of the reserves must be adjusted upwards. Since the liabilities in this scenario generally increase more than the assets increase (thanks to higher bond values in the investment portfolio), the capital will decrease – potentially threaten the solvency ratio of the company.

Hence, it is of utmost importance for insurance companies to match the duration of their assets and their liabilities and this is most reliably done through varying the maturities of a bond portfolio and not owning volatile equities where the duration is notoriously hard to estimate.

ALM – Asset-Liability Management

The problem then becomes that the weakest companies with threatened solvency levels will have to own more of an asset that can be expected to provide very little investment returns. To somewhat alleviate the problem a number of discretionary patchwork rules have been established in various parts of the world that allow insurers to use a higher cost of capital when calculating their reserve values, either as they get to phase in lower market rates gradually over time or as there are floors set on how low the discount rate can go.

Buy equities high and sell low?

In all, this introduces an unfortunate pro-cyclical investment behavior in the life insurance business and more so for the less financially strong companies that really could use the extra returns. In continental Europe the life insurance sector has had very low equity allocation in their investment portfolios all through the equity up-cycle since 2009/2011. In principle P&C insurers have the same problem but with lower durations that gives smaller investment portfolios and with lower gearing the problem is significantly smaller.

Voluntary regulation: an oxymoron?

In contrast to the banking sector the European regulatory Solvency regime has been of a more voluntary nature and when companies haven't been found to pass the solvency capital requirements in performed stress tests, little remedies have been demanded. Potentially the regulatory supervision will tighten going forward as an initiative called ComFrame (common framework for the supervision of internationally active insurance groups) are working to consolidate and strengthen insurance regulations for multinational insurance companies.

G-SII – Globally Systematically Important Insurer

A number of insurance companies have already by the IAIS and FSB (International Association of Insurance Supervisors and Financial Stability Board) been listed as G-SIIs (Globally Systemically Important Insurers) and they will from 2019 have to communicate further capital

ratios and hold higher buffers. Currently the G-SIIs are:

- 1) Aegon N.V.
- 2) Allianz SE
- 3) American International Group, Inc
- 4) Aviva plc
- 5) Axa S.A.
- 6) MetLife, Inc
- 7) Ping An Insurance (Group) Company of China, Ltd
- 8) Prudential Financial, Inc
- 9) Prudential plc

No Scandies yet

US regulation

The US capital rules stipulate that the insurer holds enough capital equal to the so-called risk-based capital (RBC) requirement. RBC is a factor-based methodology built on US statutory accounting that does not adjust for market values of assets and liabilities. The RBC ratio is further set so that it is supposed to prevent a ruinous loss in 95% of cases over an unspecified period of time. Internal models are less often used under the RBC framework than under Solvency II.

Action levels

Depending on the level of the RBC ratio, that is the so-called total adjusted capital divided by the risk-based capital, the US commissioners take different actions. Above 200% no action is needed, between 150 and 200% the company is expected to produce a plan how to get above 200%, between 100 and 150% the commissioner investigate the business while the company is in charge of executing changes to improve the situation, between 70 and 100% the commissioner is allowed to take the company under control to try to remedy the situation and below 70% the commissioner must take the company under control.

Looming federal regulation

One complication for those US insurers deemed SIIs is that they due to this under the Dodd-Frank Financial Reform Act will be regulated by the federal government instead at the state level. This would potentially mean more "bank-like" regulation with higher capital requirements, lowering ROE. MetLife has appealed being put under federal governance and has won in lower courts. MetLife in their appeal pointed to the limited liquidity risk in insurance compared to banks – one never hears about "insurance runs".

As of now IAIS has no regulatory authority and can only give recommendations. Still, global coordination of rules will likely begin with the G-SIIs but could trickle down to smaller companies later on via adjustments to local regulations.

8.8 Valuation

Valuation multiples

Like in most sectors investors' first choice is to value insurance stocks using valuation multiples relative to comparable peer companies or in absolute terms. The multiples used are quite traditional like PE-ratios, Price-to-Book ratios and dividend yield or they could be more exotic like P/EV, which is price-to-embedded value that we will look at later.

Higher ROE and growth but with a caveat for the latter

Companies with higher return on equity (ROE) and with sales and earnings growth generally see higher PE-ratios which as we know, at least with regards to the latter, can be fairly dangerous since swift movements in market share tend to backfire in the insurance business. The risk is that the growth doesn't sufficiently factor in the concept of a "bad sale". Partly due to the low transparency of insurance company accounts but also due to the relatively impenetrability of the (life insurance) products the valuation multiples have historically been lower than for the average listed company.

And more

Other key drivers of the valuation levels are the combined ratio, the size and growth of the float, the investment return on both reserves and capital, the reserve releases/net reserve flows and the size of the solvency capital buffers. The solvency level isn't just a risk measure but also reflects the sustainability of the company dividends – and many investors have chosen to invest in insurance companies due to the often reasonably good dividend yield.

Don't pay peak multiples for peak earnings

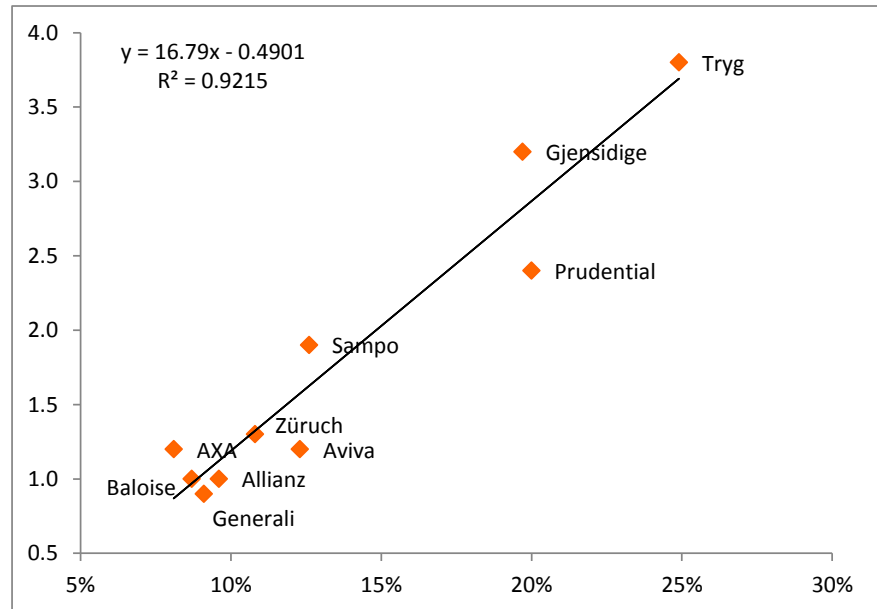
Just as in any reasonably cyclical business you want to avoid paying top valuation multiples for peak profits. When judging if PE-ratios are attractive or not it is wise to make an assessment if the combined ratio is outside what could be expected to be a normalized level. If the combined ratio is lower than normal (i.e. profit margins are higher than what they can be expected to be in the future due to higher than normal pricing or lower than normal claims) then a lower PE-ratio is warranted, everything else alike.

P/B vs ROE

Due to the volatility in earnings many prefer balance sheet based valuation metrics. Book value is a reasonable predictor of future earnings capability since insurers' ability to write premiums and generate income is directly related to the size of their capital. A usual practice is to look for discrepancies between the Price-to-Book level and the ROE level where companies with relatively low valuation

multiple in comparison to the company's ROE level is seen as potentially undervalued (Prudential and Aviva below).

Picture 8.22. Price-to-Book 2017e (y-axis) vs ROE 2017e, % (x-axis)



92% correlation

Source: FactSet consensus estimates

This is an effective model but obviously not problem-free since without normalization it encourages short-term maximization of profits and by this ROE, potentially at the expense of future value creation. The "E" will to some extent consist of volatile accumulated other comprehensive income (AOCI) and due to the volatility some exclude this from the calculations. Still, AOCI might be volatile but it adds to the capital base and by this to the income generating ability.

Normalizing ROE

Further, without adjustments the model doesn't consider how relaxed or tight the capital situation of the company is, or the sustainability of the profit generation due to cyclical variations or the quality of the book value due to varying reserve practices.

Tangible book is not an improvement

To add a margin of safety some analysts strip out goodwill and other intangibles to arrive with what is called tangible book value. The above picture would then instead picture the measures P/TBV vs ROTE. However, in back-tests of investment returns of pure book value measures tend to outperform tangible book value measures. The tangible book value is a proxy for the liquidation value in a run-off where intangible assets would have no value.

Just as in banks the above parameters can further be used to estimate an absolute fair value of the stock. The method, that is a derivative of the Gordon growth model, estimates the value of a the insurance company's shares by looking to the ROE the company generates in relation to the estimated cost of using the same equity (COE) and also factors in the growth in earnings.

Absolute valuation

We would advocate the use of normalized forward looking ROE factoring in capital buffer requirements and normalized expected growth rates as opposed to the ones that are generated at any particular time. In a commodity business there is a relatively fast reversal to the mean of all outlier numbers. The calculation of the justified price-to-book is as follows:

Justified P/B

$$\text{Justified P/B} = (\text{ROE}-g)/(\text{COE}-g)$$

Justified P/B * B = justified P

Although simple, the method throws out an absolute value for a stock that is independent of how other insurance company stocks are priced by the equity market. Say that an insurer can be expected to have 12% ROE, the required cost of using the equity is 9% and the earnings are expected to grow by 3% per year going forward. The equation $(12\%-3\%)/(9\%-3\%)$ equals a justified price-to-book ratio of 1.5x. Multiply this multiple by the equity per share and that is how the stock market "should" price the share. Now, say that the shares instead trade at 1.3x price-to-book in the stock market, then the shares could be considered to have a 15% upside.

Dodge accounting issues...

The problem with using valuation multiples based on accounting figures is quite frankly that they at times say relatively little about the underlying value creation in some companies – or at least they say less than in most sectors and especially so within life insurance.

...by using embedded value (EV)

In life insurance current cash flows are a poor indicator of value added in a life contract and both liabilities and assets are highly volatile. The cash flow is negative when a life insurance contract is signed mainly due to sales costs and commissions. This explains the attractions of embedded value (EV) as a compliment to traditional accounting. EV calculates the value of the insurance life business based on the value of existing business plus the existing capital.

There are a number of varieties of EV called traditional embedded value, European embedded value (EEV) and market consistent embedded value (MCEV). To discuss all the intricate details and differences lies outside the scope of this text but they relate to the types of assumptions made about the future and the methods to make them.

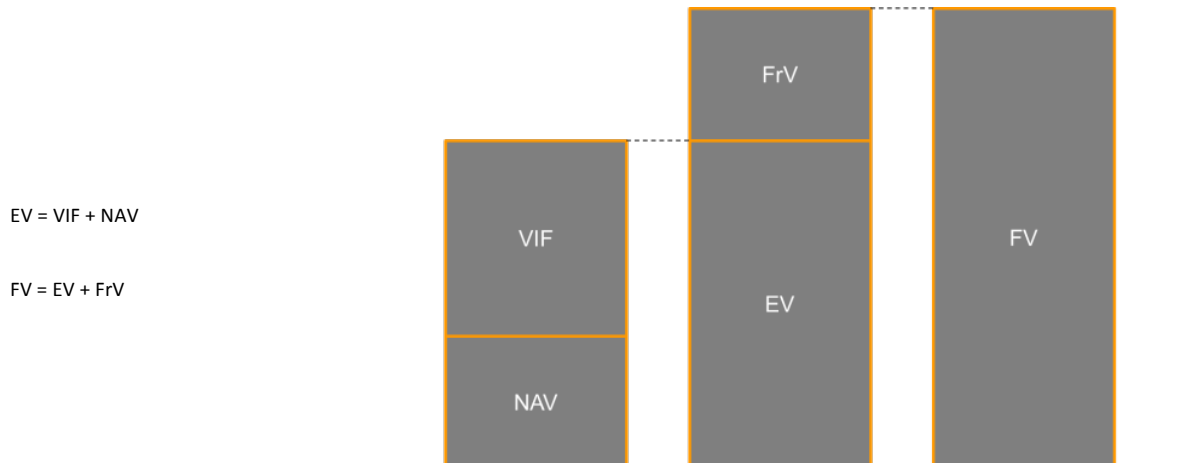
Drawback

The drawbacks are that EV is based on a number of highly uncertain long-term assumptions, it is not a standardized accounting concept allowing for differences in assumptions and treatment between insurance companies and it's also a complex measurement hard to penetrate. There are a number of difficulties in estimating future income, investment returns and costs, in correctly estimating risks and by this assigning proper discount rates. If a number of inputs (up to 200 by some accounts) all are adjusted in a slightly optimistic way the combined effect on the EV can be massive.

Residual earnings model

EV is as such perhaps the most hotly debated topic in insurance investments but at its core the embedded value methodology is quite a simple residual earnings model that adds the present value of future profits net of costs to the value of the present capital. Below we try to give a schematic picture of the EV concept and its parts.

Picture 8.23. Embedded Value and Fair Value



Source: The author

NAV – Net Asset Value

VIF – Value of In-Force

EV – Embedded Value

FrV – Franchise Value

FV – Full Value

Embedded value equals net asset value (NAV) plus value of in-force (VIF). NAV is the market value of shareholder capital minus goodwill and adjusted for unrealized gains and losses. VIF is the present value of projected stream of future profits expected to be generated by policies on the company's books ("in force") at the valuation date, net of the costs of target solvency capital usage. If no new policies would be written VIF would by definition decline over time as the existing policies expire while NAV would increase by the amount of retained earnings.

UB – IB = EV profit

With an ingoing balance and an outgoing balance the EV changes during a year creating an EV profit. The key changes to EV during a year are 1) the estimated net present value of new business written, 2) the return on the investment portfolio during the period, 3) the so-called

unwind, that is the increase in the value of an in-force policy's future profits as they are discounted by one year less, 4) assumption changes made during the year and 5) the payment of dividends.

ROEV – Return on Embedded Value

Items 1-4 constitute the EV profit and when we divide this profit measure with the EV this gives us a return measure quite naturally called return on embedded value (ROEV). It is quite possible to use the ROEV instead of the ROE in the above justified Price-to-Book calculations (or Price-to-EV in this instance). Similarly, charting the correlation between P/EV and ROEV could reveal undervalued and overvalued stocks along the lines of chart 8.22 above.

FrV – value of what might come

EV is an estimate of the present and future economic value of the current business but excluding any prospective value to future additional business. Franchise value (FrV, sometimes called business goodwill or simply goodwill to make things less intuitive...) is the estimated present value of future new business that will be written by the company. Finally, Fair value (FV, by some called appraisal value) is EV plus FrV, i.e. the total estimated value of the life insurance business as a going concern.

A DCF with unknown assumptions

The FV concept is fairly similar to a discounted cash flow value – only you don't really know any of the assumptions going into the valuation. After a number of debated situations and corporate scandals such as the one in Swedish Skandia the trend has been to move away from EV towards IFRS/cash based analysis despite all their inbuilt weaknesses.

A balancing act

An insurance operation is a balancing act where short-term victories of battles can become long-term losses of wars. Companies exhibiting strong performance over time generally generate strong ROE and stable sustainable earnings sufficient to maintain a prudent capital level and still generate growth plus give out dividends. Strong risk management is a key factor in how long-term winners balance operational growth, balance sheet strength and the development of the business offering.

No-limits Skandia

With revenues arriving prior to uncertain future costs the lure to engage in aggressive growth will always be present in the insurance business. One near-to-home example of this was the aggressive and bonus fueled expansion of Skandia in the US and the UK in the late 1990s. With the no-limit bonus schemes the allure to pump up the short-term numbers on the expense of the future profitability was irresistible.

Picture 8.24. The illusions of high growth

Risk transfer from managers to shareholders?



Source: Skandia webpage (left, saying "The bonus of the Skandia executives: [SEK] 3 billion" and the Economist (right)

"Weathbuilder": best name ever!

Skandia had two synthetic option programs called Sharetracker and Wealthbuilder where the payouts in the first were based on the share price development and in the second on the estimated embedded value plus a proxy for the value of future business, measured through new sales multiplied with a multiple of 10x in the UK and US business unit. Without informing the board the CEO changed these to no-limit programs without any ceilings.

Y-o-y growth of 70%, a screaming buy?

The set up was as if tailor-made for making the employees pumping up short-term sales without consideration of the quality of the business brought in and to engage in lax accounting. During the first 5 months of 2000 Skandia's revenues grew 50% y/y and the May sales grew 70% y/y (!) – from then on the share dropped by 95% over three years.

Nobody knew

As an anecdote, one of Sweden's most well-known asset managers some time prior to the collapse went to visit the CFO of Skandia and asked how he could try to make sense of the balance sheet of the company as it seemed impossible to penetrate. The answer he got was: "Yes, it's totally impossible".

Hopefully the Skandia scandal should work to vaccinate Swedish investors from being blinded by profit growth way above the rest of the sector and unrealistic growth targets from corporate executives.

8.9 Investing in Insurance

Shifting loyalties

Insurance stocks have historically moved much in line with the equity market as capital has been invested into equities and since the demand for savings products tends to be correlated to the fortunes of the stock exchanges. However, post the financial crisis the sensitivity towards the stock market has declined since the low rates has affected the capital ratios of life insurers. Stock prices have for some years now been highly correlated to interest rate volatility.

Market structure

A commodity

Insurance isn't the simplest of businesses to penetrate but the insurance product is at its core a commodity. The industry is mature in the western world, customers rarely pay a premium for a corporate brand and products are simply financial constructs that are easily replicable for competitors. During periods of relative calm and good pricing new capital often enters the industry.

Europe vs US

Despite that each European market often is an oligopoly and the fact that an insurer's reputation is important in attracting customers, the pricing power is low. The US P&C market is contrast quite fragmented with over 2,500 suppliers and in the 10 largest companies control less than 50% of the market. The personal line business is more concentrated than the commercial line due to the lower premiums and larger scale needed to roll out mass products.

ROIC = WACC

Viewed on global scale insurance companies historically have had a real return on invested capital about equal to the real cost of capital and the growth rate has been relatively similar to the GDP-growth. The key differentiator in the underwriting business, as in any commodity industry, is cost structure where the low cost provider can have a competitive advantage.

Cost, cost, cost

Cost efficiency becomes crucial to compete over the long term. Unique and differentiated customer acquisition platforms can give at least temporary cost advantages. Retaining existing customers is much cheaper than attracting new ones making customer stickiness important for the cost development. Captive sales networks or cross-selling several policies at discounts helps stickiness but the strategies cost money and they are not very hard to replicate for competitors. Since acquisition costs in the sector to some extent are market driven with the high usage of external parties, low administration costs offer a lever for cost leadership.

Small fixed costs

It is possible to gain lower SG&A costs due to scale in a specific product line (not by size of a diversified company). However, the fixed costs are relatively limited in insurance making scale advantages less important than in many industries. With relatively small fixed costs the synergies from M&A is also less obvious within insurance than in some sectors.

Some scale needed and...

The scale needed is the one where the insurer can take advantage of the diversification through the law of large numbers. Which size this is differs between different insurance products – the casualty insurance of commercial aircraft will never be a widely fragmented sector.

...some scale advantages

Still, in some simpler personal line product lines where the underwriting process can be automated to a higher degree, the proportion of fixed cost from IT-systems might be higher and thus scale advantages more important. Further, it could be argued that a sufficient scale in technology resources could be an advantage in building future big data capabilities to better price and underwrite risks.

Culture > skill

It would seem reasonable to argue that a better ability to underwrite and price risk than one's competitors could be a competitive advantage. However, as long as employees aren't captive to one employer and everybody has the ability to invest in necessary databases and IT-systems any advantage build on employee skill is rather fragile. Perhaps if supported by a corporate culture that supports and incentivizes prudent underwriting, skill could be a sustainable advantage as corporate cultures are very hard to change. However, an underwriting edge can be easily destroyed by poor pricing decisions by corporate managements in search of growth or by expansion into new business product lines where the company lack its edge.

Edge in investing

Although there might be a small number of shining historic exceptions (Berkshire Hathaway, Fairfax Financial etc.) it is hard to argue that one insurer can have a sustainable competitive advantage in generating investment income – making the underwriting business the only source of complete differentiation. We would however flag up one available systematic advantage in the investment operations and that is financial strength. With a high solvency an insurer has the ability to allocate its assets more freely into higher risk/return areas and by tolerating a higher volatility in the short run the long term investment income can be higher.

Positioning

Price vs value

In all fundamental investing a stock's attraction depends on the price of the stock compared to what the underlying values of the company are. Not discussing the price, the attractiveness of an insurance company to some quite substantial extent depends on factors that the company cannot influence in the short run such as the competitive position on the geographical markets it competes on and the products the company provides.

Demand life

The demand in the life insurance sector should in principle be driven by the need for people to save for retirement outside the public pension schemes. In general the ageing population of the western world is under-saved and the public (and many corporate) pension schemes are not in the best shape. Despite the need for retirement savings this however doesn't always materialize as demand for life insurance products. Health insurance is another business that quite naturally should benefit from the ageing population.

Demand P&C

Differences in demand in the P&C business follow a geographical divide. Large parts of emerging markets are severely underinsured even when judged by the countries relative wealth. A growing middle class with more spending power on housing, cars and other durable goods provide a fertile environment for auto and property insurance. In contrast, most parts of P&C insurance are very mature in the western world.

Nordics a good place

Anglo-Saxon countries like the UK and the US have moderate growth and high competition with customers that often switch suppliers while the Nordics in relative terms have loyal customers, low distribution costs and a fair degree of segmentation between insurance companies allowing okay margins.

Slow repositioning

Over the longer term companies can obviously chose to focus more on less commoditized product lines but entering a market organically is a very slow process for those who want to retain a sustainable pricing strategy. The simpler and homogenous products and the more focus on personal lines the more commoditized is the general rule.

A Wish List

Investing in any stock is as noted a balance between the price you pay and the qualities you receive from owning the company. If we were to construct a wish list of desirable qualities of insurance companies this could be one suggestion:

Wish list

- Geography
 - Business line
 - Capabilities
 - Management
 - Current development
- Geographic positioning – situated in a country with high real economic growth, low but rising insurance penetration, well-consolidated market with low competitive level and sufficient regulatory oversight.
 - Business line positioning - a product mix tilted towards products with slightly higher growth rates but still predictable returns combined with captive distribution channels that provide greater pricing power.
 - Internal capabilities – strong internal sales organization, strong technical expertise judged by the volatility of underlying loss ratios and in the reserve development in P&C businesses and by the volatility of the investment margin in life insurance (how good is the company to take underwriting risk and to invest its float?), combined with a prudent balance sheet stability that gives resilience against macro shocks and the like. A good company in our view should regularly have a combined ratio well below 100% to avoid depending on the volatile investment income to generate profits.
 - Conservative and competent management – disciplined in reserving, willing to grow more slowly when conditions are bad and makes money during bad periods and generally looks to profits before growth, careful in choosing business lines and disciplined in M&A and capable in managing the capital structure. Investors must at all costs avoid the most aggressive players with the weakest reserves and reserve development.
 - Current development - ideally the current business development should be improving, potentially due to a turn for the better in the cycle, but we don't want to see unsustainable growth levels, as they are just that - unsustainable.

"That which is unsustainable won't be sustained" /Hyman Minsky

Tradeoffs required

Apart from the country growth, the low and rising penetration and obviously varying current developments - the Nordic insurers rank fairly well on the other metrics, although not all of them are listed entities like Sampo. No insurance company will satisfy all criteria so tradeoffs will have to be made and balanced against the valuation of the stock.

Watch the FX

Note that we stress real economic growth in the first bullet. Investing in foreign high inflation countries will give exposure to high nominal growth numbers but when translated to your domestic currency the foreign exchange changes will risk eating away all the benefits.

Cyclical P&C

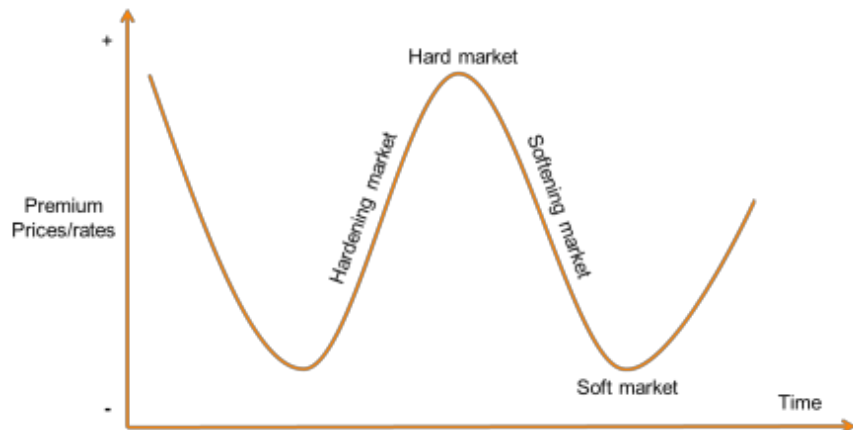
In the wish list we referred to “a turn to the better in the cycle” and we need to explain this further. The P&C business is highly cyclical. In any cyclical business it will on a medium-term horizon be important to invest at the right time of the cycle.

The underwriting cycle

Pricing in P&C insurance tends to follow a so-called underwriting cycle due to supply and demand and related competitive factors. Supply in the insurance sector means capital. The more capital an insurer has on its balance sheet the more premiums it can write. The fact that claims are future uncertain cash outflows means that insurers can have very different views of expected claims and thus price products very differently. The view doesn't just differ between insurers it also changes with the psychological climate and recent experience of claims losses.

Picture 8.25. The underwriting cycle

Not the same as the economic cycle
(if something the reverse)



Source: The author

Hardening -> hard ->

The market shifts back and forth between a soft market with low prices and a hard market with high prices. In a hardening market competition is less and there is an undersupply of underwriting capacity that makes premium rates go up. In hard markets insurers earn good profits, the combined ratios are below 100% and valuation multiples often higher than average but competition and underwriting capacity has increased making prices peak.

-> softening ->

In the following softening market the competition is intense, there is an oversupply of underwriting capacity and the poor underwriting discipline makes prices go down dragging down valuation multiples as well. For the time being the profitability holds up since the reserve standards are relaxed among some of the companies.

-> soft ->

In a soft market profitability is poor, the capital will be under pressure and combined ratios often above 100% but competition is falling off, capital withdrawing from the sector. With less capacity and sufficient pain felt among remaining insurers, discipline improves and the price decline bottoms out.

-> and hardening again

We now again face a hardening market but profits are at first not improving fast since companies might have to up their reserve values to more realistic levels. Note that the movements don't necessarily follow the business cycle but, if something, the softening market coincides with a buoyant economy since in good times price competition heats up.

Never waste a good crisis

Another occasion when the collective price discipline improves dramatically is after large catastrophic losses due to natural disasters, terrorism or a swift financial crash like the 2007/09 financial crisis. This at times provides a good investment opportunity as investors will be nervous about and possibly over-discount the underwriting losses and at the same time as the shares are dwindling, the disaster will both remind prospective customers that they probably should increase their insurance protection and produce higher insurance rates.

Earnings sustainability

Analyzing ROE

Over time the most important value driver in insurance is the normalized ROE. This measure can, in a version of the classic DuPont analysis, be broken up into four underlying sub-value drivers to analyze the sustainability of generated earnings.

First step and...

In a first step the normalized net income after tax in the ROE calculation can be broken up into an underwriting income divided by equity, an investment income divided by equity and a tax component. The underwriting income divided by equity can in a next step be broken up into an underwriting margin where the underwriting income instead is divided by premiums and a capital intensity measure consisting of equity divided by premiums.

...second step

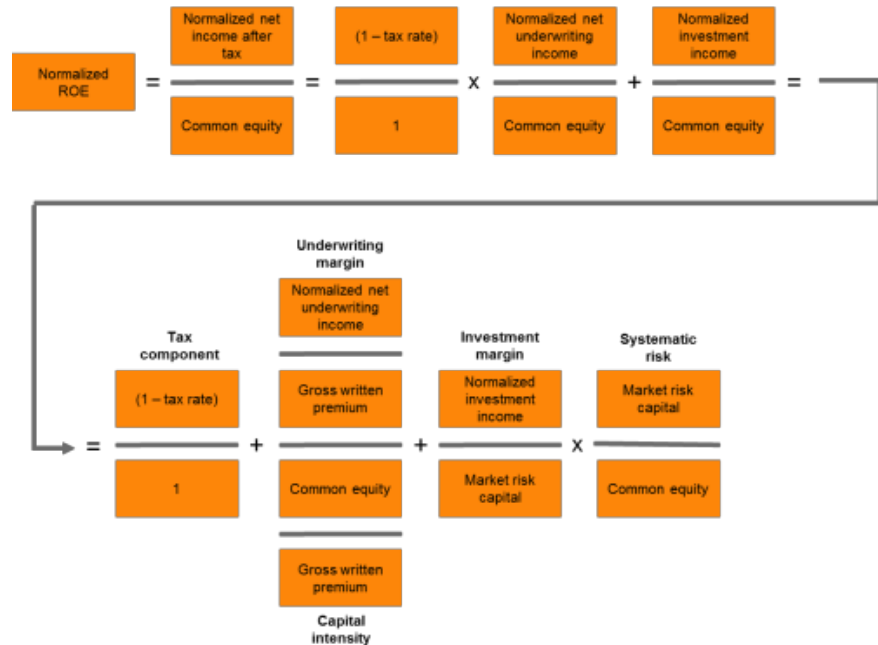
Similarly, the investment income divided by equity can in this next step be broken up into an investment margin where the investment income instead is divided by the investment assets and a risk measure consisting of the investment assets divided by equity. There we have our 4 sub-value drivers.

Get a grip

Insurers with sustainably high ROE have tended to outperform, everything else alike, but it is important to understand how the ROE and the change in ROE is generated. An investor that follows the development for the underwriting margin, the capital intensity, the

investment margin and the systematic risk as defined below will gain a fair understanding of the company.

Picture 8.26. DuPont analysis for insurers



Who knew ROE contained so much!

Source: The author, brackets are removed from the equations for better visual clarity

With regards to the underwriting margin, the underwriting income can be broken up into premiums minus claims losses minus expenses for further granularity. The capital intensity is both a type of inverted capital turnover measure plus a sign of the aggressiveness and riskiness in how the company utilizes its capital.

Further detail

The volatile investment margin could if the numbers were available be divided into the investment income that in the future will accrue to policyholders due to the conditions of their life insurance products and the part that belongs to the insurer. Systematic risk measures the capital market risk in the company. To further understand the risk the investment capital could be broken up into the main asset types like equities, bonds etc.

Compare against history and against competitors

Armed with an insight into the historic trends in the 4 sub-value drivers and how these compare to those of the competitors plus the insight that the growth rate in net income equals: $g = ((\text{net income} - \text{dividends}) / \text{net income}) \times \text{ROE}$, the investor will have a better ability to make an informed judgement about the sustainable medium-term growth rate for an insurer. If the actual growth rate during a period has been higher than the one deemed sustainable this is a warning sign and vice versa.

Good luck

With a return on capital that is fairly close to the markets required cost of capital this is perhaps not a buy-and-hold sector. Still, there are companies with higher ROE-levels than others. The differences are often well priced by the market and it is important to understand that the ROE-level is sustainable but now and then there could be an arbitrage to be made. Further, it is possible to make well timed purchases and sales through the underwriting cycle but it requires a time-horizon of at least a few years. Perhaps the largest value-add is to simply stay away from unsustainable growers.

Happy investing!