

# sigma

---

## **Profitability in non-life insurance: mind the gap**

- 01 Executive summary
- 02 Introduction
- 06 Deconstructing the drivers of profitability
- 09 Long-term profitability trends
- 25 The non-life insurance profitability cycle
- 29 Quantifying the current profitability gap
- 32 Outlook for the economy and non-life insurers
- 37 Appendix

# Foreword

This year marks the 50 year anniversary of *sigma*, the flagship publication of Swiss Re Institute. Since its inception, *sigma* has helped position Swiss Re as a thought leader by providing valuable insights on the insurance industry for clients and a broader range of stakeholders, including regulators and academia. The underlying motivation remains to support and further Swiss Re's ambition to make the world more resilient.

This edition of *sigma* analyses the current state of profitability and trends in the underwriting cycle of the global non-life primary insurance industry. *sigma* has covered this topic on many occasions previously, including in its inaugural year (1968), when it investigated underwriting results and expense trends. Back then, insurance premium rates were highly regulated in many markets, especially for the largest line of business, motor insurance. *sigma* 3/1968 stated that "significantly more than in other branches, political reasons prove themselves in certain countries to be an obstacle to the adjustment of the premium rates in accordance with the rising costs".

The key factors impacting insurance sector profitability have developed and changed over the decades. Among main themes have been the soaring inflation in the 1970s, radical expansion of US legal liability in the 1980s, and the wave towards deregulation of the financial and insurance markets in the European Union in the 1990s. Throughout the last 50 years, while external triggers, regulatory frameworks and market structures have all changed, the cyclical fluctuation of rates, premiums and claims has remained a defining driver of insurance industry performance.

A main factor for sector profitability has been returns from investment. For example, in 1981 *sigma* concluded that "seen overall, the industry's earnings can be considered satisfactory since the deterioration of underwriting results was mostly offset by an increase in investment income". By contrast, the *sigma* 5/2001 noted that "interest rates are low and most equity markets are in the doldrums, making profitability through investment returns challenging". In our latest study, we explain that underwriting results have deteriorated over the last few years, without the benefit of a compensating rise in yields.

The *sigma* team remains committed to identifying key drivers for the insurance industry and detecting turning points in sector profitability, as well as undertaking deep-dive studies on specific themes. Please visit the *sigma* 50-years section on Swiss Re Institute's website ([institute.swissre.com/sigma50years](https://institute.swissre.com/sigma50years)) to find out more about the evolution of *sigma*, and the breadth and depth of our overall research offering.

Edouard Schmid  
Group Chief Underwriting Officer  
Group Executive Committee Member  
Swiss Re

Jeffrey Bohn  
Director of Swiss Re Institute  
Managing Director  
Swiss Re Institute

# Executive summary

Non-life insurers need to improve their underwriting margins significantly to reach target profitability levels.

We seem to have reached an inflection point in the pricing cycle of the non-life insurance market, there being some evidence of rate hardening. Overall, however, most major markets remain in a phase of below-average profitability. The decline in profitability of recent years reflects the soft underwriting cycle, weak investment performance, and the high level of capital funds. In spite of modest premium rate hardening since late 2017, our analysis shows that more work needs to be done if still-existing shortfalls in profitability are to be redressed. In this *sigma*, we estimate that underwriting margins need to improve by at least 6 to 9 percentage points in the major western markets, by 5 points in Japan, and by 1 point in Australia and China if insurers are to deliver an acceptable return to investors in the future. The assumed target return on equity (ROE) ranges from 10% for mature western markets to 15% for China, partly reflecting differences in interest rates and past performance.

Over the long run, the non-life insurance sector has proven attractive for investors....

In the last decade, the average ROE of the nine markets in our analysis was relatively low at 6.5%, reflecting a period that included the global financial crisis and unusually high catastrophe losses in 2011 and 2017. Over the long run, insurers have delivered profitability levels comparable with firms in other sectors. In particular, we find that the ROE of insurance stock companies in the US is similar to other capital-intensive sectors of the economy. In line with these profit trends, a two decade comparison of non-life insurers' stock market performance suggests at par or even above-par valuation. Furthermore, the Property & Casualty sector presents additional value to investors in the form of diversification benefits.

...but in recent years, declining profitability has seen a slowing of capital injections into the sector.

Investor comfort with the performance of insurers has been demonstrated by the regular injection of new capital into the sector at times of market opportunity. However, this has not been the case in more recent years as profits have declined. Instead, in the last five years, US non-life stock companies have returned more capital to investors through active capital management, paying out on average 80% of net profit to shareholders and retaining only 20% to fund further growth.

Underwriting cycles are increasingly correlated globally and have become longer.

Underlying trends indicate that underwriting cycles are strongly integrated globally and across lines of business. While we identify a general cyclical pattern, some idiosyncratic variations persist due to natural catastrophe losses and a degree of country- and line-specific pricing trends. Hence, writing non-life business across lines and countries adds diversification to an insurers' underwriting portfolio. Notably, reflecting globalisation, cross-country correlations of combined ratios have increased in the past two decades, following deregulation in insurance and capital markets. Additionally, the average duration of the cycle seems to have lengthened since the early 1980s, when central banks changed their policy focus toward fighting inflation and large parts of the financial services industry were deregulated.

We believe current economic momentum will support insurers' earnings, but will not generate sustained improvement in profitability.

Interest rates and non-life insurers' underwriting results are interrelated over the long run. Our analysis shows that during periods of higher interest rates, stronger investment returns have been offset by larger underwriting losses. Changes in interest rates are not a meaningful driver of the cycle in a short-term context though. Current economic momentum will benefit future profitability through (moderately) higher interest rates and investment returns in mature markets, but tighter labour markets will likely push up general and claims inflation also. In addition, we expect that accelerating claims inflation will erode the adequacy of claims reserves, which have already worn thin. This further affirms that to achieve sustainable improvement in sector profitability, insurance premium rate increases in excess of rising claims trends will be needed.

In the long run, investments in technology serve to improve underwriting and the insurability of increasingly complex risks.

The pressure on insurers' profits has heightened interest in innovation. Investments in technology have led to efficiency gains and compressed margins for the distribution system of commoditised business, and in some lines also to lower claims costs. Initially, the benefits for insurers' profitability are clouded by the gains being partially passed on to consumers, and also by the cost of the investment. In the long run though, investments in data and advanced analytics improve underwriting and insurability of increasingly complex commercial risks, be it through improved affordability, access or better ability to underwrite new and hard-to-quantify risks.

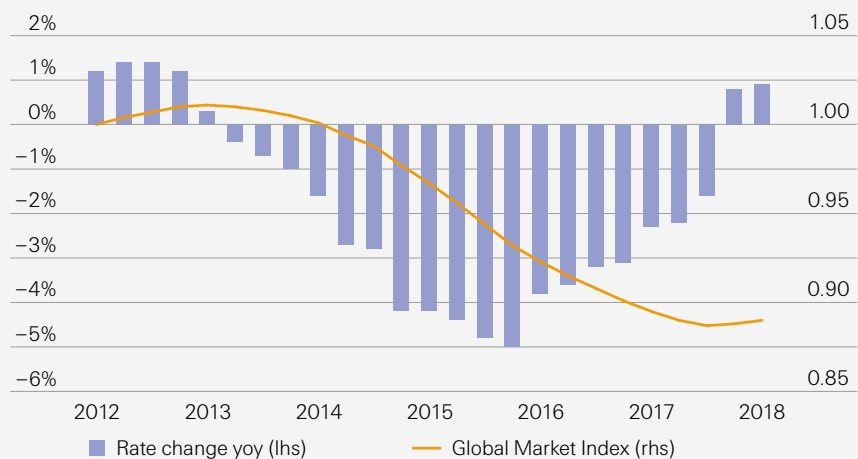
# Introduction

ROE for the global non-life insurance sector slipped to 6% in 2017, as the weak phase of the profitability cycle continued.

The global non-life insurance sector is currently at a weak phase of the profitability cycle. Sector profitability declined in 2017, with return on equity (ROE) slipping to 6% from 7% in 2016, well below the roughly 9% achieved annually between 2013 and 2015. Last year's result was driven by three main factors:

- Soft underwriting conditions. Following a modest improvement in commercial insurance prices in 2012, rates fell for 18 consecutive quarters, with the global market index in 2017 at just 89% of its 2012 value (see Figure 1);
- Low investment yields. Investment returns for non-life insurers remain under pressure. Average yields have stalled due to the ongoing low interest rate environment. The contribution of investment returns to profitability last year remained at the post-crisis low level of 9%–10% of net premiums earned; and
- Large natural catastrophe losses in the US.

**Figure 1**  
Global commercial insurance rate development, 2012–2018



Source: Marsh

Underwriting conditions remain soft, but are passing through an inflection point.

Underwriting conditions remain soft in 2018, particularly in commercial insurance, but are passing through an inflection point. This is in part due to the large hurricane losses in 2017 which set the stage for a price correction. An active hurricane season in the North Atlantic, and a series of wildfire, thunderstorm and severe precipitation events across different regions pushed global catastrophe (cat) claims to the highest level ever recorded in a single year. Total insured losses from natural catastrophes and large man-made disasters in 2017 were an estimated USD 144 billion.<sup>1</sup> The hurricanes Harvey, Irma and Maria, and wildfires in California, resulted in significant losses in US Property and Casualty (P&C) re/insurance. The insured losses from the three hurricanes alone were estimated to be USD 92 billion. US insurers' non-life underwriting results were also hit by USD 19 billion in claims resulting from tornadoes and convective storms, and USD 13 billion from the California wildfires.

The record cat losses of 2017 were severe enough to spark a modest change in market dynamics.

The cat losses were severe enough to spark a modest change in market dynamics, but it remains to be seen how strong and sustainable the firming market will be. In this year's renewals, rate increases for accounts and lines of business not affected by the cat losses have been below initial expectations. At the same time, competition remains elevated because of the still-strong capitalisation of insurance carriers. Also,

<sup>1</sup> All 2017 cat loss estimates as per *sigma* 1/2018 – Natural catastrophes and man-made disasters in 2017: a year of record breaking losses, Swiss Re Institute.

Global commercial insurance rates were slightly higher in late 2017 and in the first quarter of 2018 due to an improvement in property lines.

reinsurance capacity remains plentiful and alternative capital (AC) funds were quickly able to re-load the capacity that was triggered or trapped by the cat losses.

Marsh's global insurance market report for the first quarter of 2018 indicated that global commercial insurance rates rose by 0.9%, after a 2.3% decline in the previous year.<sup>2</sup> The positive trend was driven by the property sector (see Table 1). Property rates globally rose by 2.7%, mostly in response to high cat losses in affected regions. Property rates in Europe stabilised and the decline in Asia slowed, since these markets were not affected by large cat losses. Casualty renewal rates were down again in the first quarter, by 1.7%, while rates for Financial & Professional Liability covers hardened slightly. In the US, rates for commercial auto continued to harden strongly. In regional terms, the Pacific area exhibited very high rate increases across most lines, followed by Latin America, where pricing in Casualty and Financial & Professional Liability improved.

**Table 1**  
Global commercial insurance rate index in the first quarter of 2018

Rate changes in percent	Global	US	UK	Europe	Latin America	Asia	Pacific
Property	2.7 ↑	2.9 ↑	-1.6 ↑	0.1 ↑	-1.0 ↑	-1.4 ↘	12.5 ↑
Casualty	-1.7 ↘	-3.0 ↓	-2.1 ↘	-1.6 ↘	4.3 ↘	-2.7 ↘	5.7 ↑
FinPro	1.8 ↑	0.0 ↘	3.3 ↑	-1.6 ↘	1.5 ↑	-2.2 ↑	15.0 ↑
<b>Composite</b>	<b>0.9 ↑</b>	<b>-0.5 ↘</b>	<b>0.2 ↑</b>	<b>-0.8 ↑</b>	<b>0.8 ↑</b>	<b>-1.8 ↘</b>	<b>11.6 ↑</b>

Note: Arrows indicate the direction of rate change since the first quarter of 2017.  
Source: Marsh

Claims trends have deteriorated in recent years, particularly in casualty...

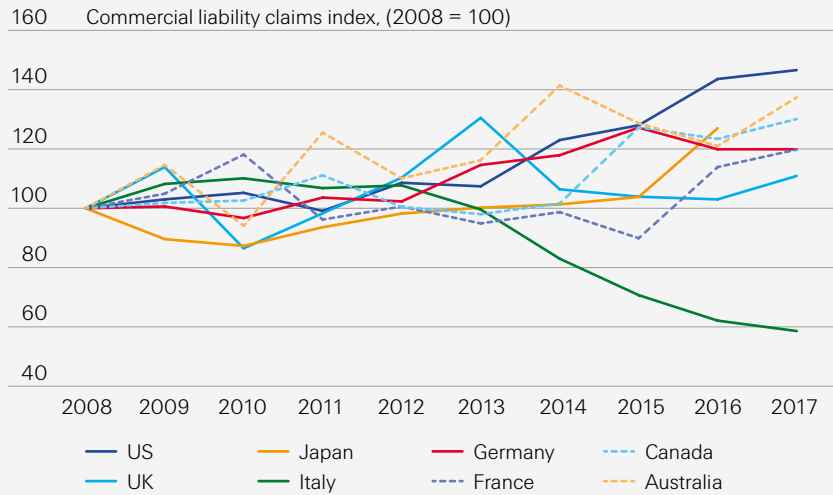
In addition to softening rates in recent years, claims trends have deteriorated. There has been a rise in claims costs, most notably in casualty lines. The biggest gains have been in US motor, where the frequency and severity of claims has picked up. There has also been heightened claims inflation in motor in Canada and Australia, and, to a lesser degree, higher claims in European motor (see *Hard market in motor: catching up with rising claims trends*). The trend of deteriorating severity has in large part been due to rising repair costs given more premium semi-autonomous vehicles on the road, more complex parts and increasing labour costs.

...which comes after a period of relatively benign claims growth in the years after the global recession.

The commercial liability sector has also experienced increased claims over the last few years across most of the markets reviewed, after a period of benign claims growth following the recent global recession (see Figure 2). In the UK, claims costs picked up only recently as a result of the Ogden rate change which required insurance companies to strengthen their reserves. In Australia, financial indemnity claims have surged in the last five years due to rising securities class actions. In Italy, by contrast, there was a strong decline in claims after 2013, due to a number of positive developments, including remedial underwriting actions by insurers in the field of medical malpractice, where loss experience had been very poor for many years, and increasing demand for professional liability covers with comparably better loss experience.

<sup>2</sup> Global Insurance Market Index – First Quarter 2018, Marsh, 2018.

**Figure 2**  
Commercial liability claims trends  
in major markets, 2008–2017



The chart excludes China, as the country’s liability lines are at an early stage of development in which claims increase alongside rapid premium growth.  
Source: Swiss Re Institute

US motor claims frequency and severity have trended up sharply since 2014.

There has been a surge in truck accidents in particular.

### A hard market in motor: catching up with rising claims trends

Underwriting results in US motor, in both personal and commercial lines, have deteriorated in the last couple of years, and insurers have increased rates since 2015 to catch up with rising claims costs. Losses have risen due to higher frequency and severity of accidents. Between 2014 and 2016, after decades of declines, US traffic fatalities surged by 14%.<sup>3</sup> With stronger employment growth and low gas prices, people have been driving more.<sup>4</sup> There has also been an uptick in speeding and drinking, but these factors alone do not explain the surge in road deaths. Arguably, a main contributing factor is distracted driving on account of increased use of smartphones by US drivers while at the wheel.

There has been a notable increase in loss frequency for trucking accidents in the US, which is related to a shortage of experienced drivers. The return of economic growth after the recession created renewed demand for drivers, which was satisfied by the hiring of drivers with less experience. Heavier trucks, higher road density, higher speeds and distracted driving have contributed to the spike in loss severity. Further, victims in truck accidents are often injured much more severely than in car accidents, and this is leading to increasingly larger jury verdicts in bodily injury cases.

<sup>3</sup> US Department of Transportation, National Highway Traffic Safety Administration.  
<sup>4</sup> US Department of Transportation, Federal Highway Administration.

Rates in commercial auto in the US declined between 2006 and 2015, while claims costs trended up.

Since 2012, adverse loss development in US commercial auto liability has contributed to elevated combined ratios. Commercial business was under-priced in the years immediately following the financial crisis. According to data from investment management firm Conning, the estimated average claim size rose by 39% between 2006 and 2015, while commercial auto rates fell by 18%. Claims severity (ie, average claims costs) for personal auto lines has also surged. Strong auto sales have seen many older vehicles replaced with newer ones that are more expensive to repair. The increasing complexity of newer vehicles – including the proliferation of safety technology – is adding to the costs of car repairs.

In Europe, claims severity for bodily injury and vehicle repair claims has been trending upwards.

In Europe, underwriting profitability in motor has also developed negatively due to increasing severity, but not frequency. Unlike in the US, motor claims frequency in Germany, the UK, France and Italy has remained mostly stable. This contrasts to the decade before when claims frequency rates declined steadily in all of the analysed markets. Claims severity in Europe continues to increase, based on rising healthcare and car repair costs.

With these pricing and claims trends in mind, this *sigma* addresses the following questions.

With these pricing and claims trends in mind, this study addresses the following questions:

- What are the main drivers of profitability in non-life insurance?
- How important are investment activity, capital funds (leverage), and volatility as drivers of profitability?
- What patterns are there to the insurance cycle, in length and between countries?
- What underwriting result is necessary to achieve a target ROE of 10–15% in the main mature markets and China, given the current investment outlook, the level of asset leverage and solvency ratios?

This study focuses on Australia, Canada, China, France, Germany, Italy, Japan, UK and the US.

To answer these questions, we focus on the non-life insurance markets of the Group of Seven (G7) countries (Canada, France, Germany, Italy, Japan, the UK and the US) and Australia and China. These main markets account for 73% of world non-life insurance premiums<sup>5</sup> and are home to most of the globally operating insurers. For Australia, Canada, Germany, US and UK, the market definition of “non-life” is P&C insurance, which excludes most health lines of business. For China, France, Italy and Japan, private health insurance is part of the non-life market aggregate.

The structure of the *sigma*.

The following chapter explains the main drivers of profitability in non-life insurance. Thereafter, we review the long-term profitability trends, including the underwriting and investment results across countries, and address the interdependence of these profit drivers. We then analyse the cyclical developments in underwriting performance and compare this cycle to the past. Finally, we quantify the current profitability gap and assess the profitability outlook for the next couple of years.

<sup>5</sup> Data for 2017, taken from *sigma* 3/2018: World insurance in 2017, Swiss Re Institute.

# Deconstructing the drivers of profitability

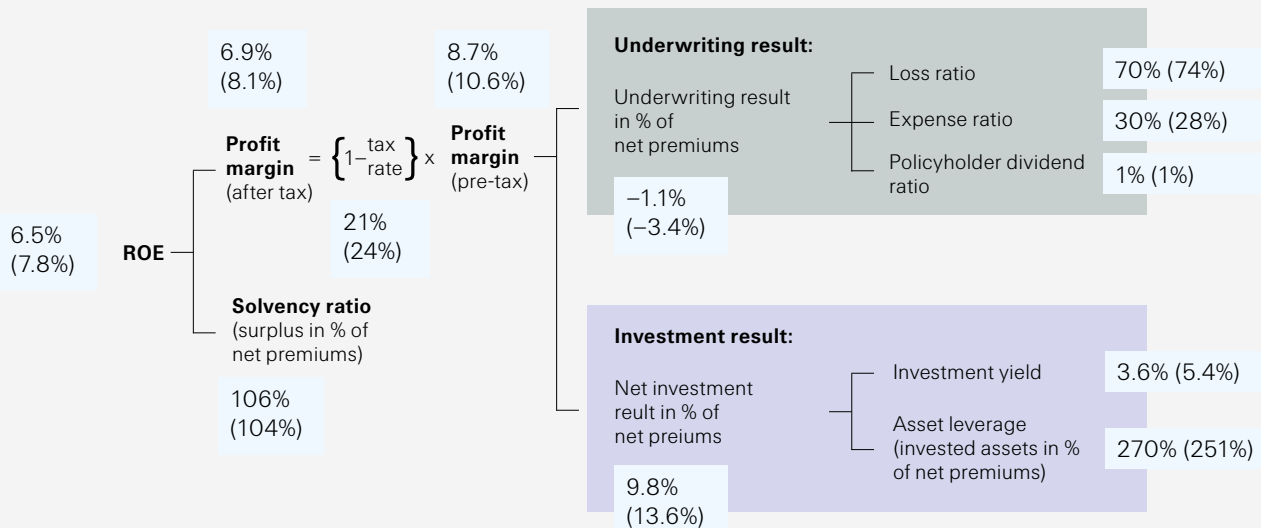
The profitability of a non-life insurer is determined by underwriting and investment performance ...

ROE is a conventional key metric used to evaluate the performance of a non-life insurer.<sup>6</sup> It is calculated as after-tax earnings divided by shareholder equity or capital funds, to relate the profit a company generates with the capital funds that shareholders have invested in it. To analyse the drivers of profitability for non-life insurers, the ROE of a firm can be broken down into three main components, as shown in Figure 3. The first of these is **underwriting performance**, which is affected by product pricing, risk selection, claims management, and marketing and administrative expenses. The underwriting result – in percent of net premiums – is composed of the loss ratio, the expense ratio and the policyholder dividend ratio. Second is **investment performance**, which is a function of asset allocation, asset management and asset leverage. The investment result is determined by total investment yield (current investment income including realised capital gains as a percent of invested assets) and the size of the invested assets (here computed as asset leverage). Summing the underwriting result (or underwriting margin) and investment result yields the pre-tax profit margin.

...and by its capital leverage.

The third main component of an insurer's ROE is **solvency ratio or capital leverage**. The overall ROE is determined by earnings after taxes realised for each unit of net premiums (or profit margin), divided by the amount of capital funds used to finance and secure the risk exposure of each premium unit (solvency ratio). The tax rate depends upon a company's tax strategy and is otherwise considered an exogenous parameter of the industry, based on the assumption that insurers adapt to the prevalent fiscal regime in a country.

**Figure 3**  
Profitability decomposition, weighted 10-year averages, 2008–2017 and (1998–2007)



Note: See glossary in the appendix for definition of the terms and formulas for the calculation of the different variables. Figures are weighted averages across the nine markets in focus for the period 2008–2017. For the decade 1998–2007, the weighted averages shown in brackets are for a smaller sample of five markets: the US, Canada, Germany, France and Japan.  
Source: Swiss Re Institute

<sup>6</sup> We chose ROE because it is a relative measure and therefore allows comparison of companies and markets of different size over time. ROE data is more readily available for all firms and markets in this report's analysis than other metrics such as economic value growth or book value per share growth.



The aggregate net investment result for non-life insurance in the nine major markets over the last 10 years was about 9.8%; the underwriting result was -1.1%.

Average ROE in 2008–2017 was low at 6.5%.

The average non-life underwriting result ranged from -2% to 2% over the same period.

The data in Figure 3 represents the weighted average values of the different components of ROE for the nine markets under consideration over the past decade. At first sight it seems that most of the pre-tax profit margin came from non-life insurers' net investment result, which averaged 9.8%. The average underwriting result, meanwhile, was negative at -1.1%. This accounting observation differs from an economic interpretation. This is because:

- while standard accounting representation separates out the investment and underwriting results, in reality the two factors are closely linked through the decision-making process of insurers. Based on cash flows, reserves and capital leverage, future expected investment returns are taken into account when calculating insurance prices; and
- market forces drive the same interrelation between underwriting and investment through competition. If insurers earn higher profits through their investments, they will try to write more business to fund more investments (ie, cash flow underwriting). Collectively, this increased competition drives down premiums which in turn reduces underwriting profitability.<sup>7</sup>

Accordingly, the pre-tax margin was 8.7%, which with an average tax rate of 21% and a solvency ratio of 106%, translates into an average ROE of 6.5% for the nine markets. Also showing in Figure 3 are the weighted averages of the same variables for the previous decade (1998–2007), but for a smaller sample of markets. The average ROE in that period was higher at 7.8%, based on a greater underwriting loss of 3.4% of premiums, but a much stronger contribution from asset management activity with a 13.6% investment result.

Table 2 compares the 10-year average performance indicators of the major non-life markets, based on statutory data. The country comparison reveals some similarities across the major markets. With the exception of Australia and China, the values of profit drivers were in a narrow range: the average underwriting result over the past decade ranged roughly between -2% and +2%, and the net investment result was in a slightly wider range, from 7% to 13% of premiums. There was more variance in the solvency ratios of the markets, from a low of 44% in China to a high of 117% in the US. Excluding China, the range of solvency ratios across the advanced markets was narrower, with Italy at the low end (83%).

<sup>7</sup> Excessive cash-flow underwriting was a key driver of the severe soft market of the late 1990s. The key issue was widespread reliance on realised capital gains and bond yields beyond risk free rates. Fierce competition drove underwriting profitability to unsustainably low levels and left the P&C sector exposed once financial markets' performance fell short.

## Deconstructing the drivers of profitability

**Table 2**  
Profitability decomposition (10-year averages) by country, 2008–2017

10-year averages in % of net premiums unless marked with +	US	Canada	UK	Germany	France	Italy	Japan	Australia	China
	2008–17	2008–17	2008–17	2008–17	2008–17	2008–17	2008–16	2008–17	2008–17
Loss ratio	73.0%	67.0%	65.8%	70.5%	73.6%	69.8%	67.4%	66.2%	62.8%
Expense ratio	28.0%	30.8%	35.0%	29.6%	25.7%	31.8%	34.4%	30.0%	37.0%
Underwriting result	-1.8%	2.3%	-1.0%	-0.2%	0.1%	-1.7%	-1.8%	3.8%	0.3%
Investment yield +	3.7%	3.5%	3.2%	3.4%	3.1%	3.7%	2.8%	5.8%	4.6%
Asset leverage	285%	250%	275%	276%	319%	249%	262%	222%	145%
Net investment result	10.5%	8.6%	8.6%	10.7%	9.1%	8.8%	7.2%	13.2%	6.8%
Other expenses (earnings)	0.3%	0.2%	0.0%	0.4%	0.7%	-0.7%	0.5%	0.0%	-0.3%
Profit margin (pre tax)	8.9%	11.1%	7.6%	10.1%	8.5%	7.8%	4.9%	16.9%	6.8%
Tax rate +	20.9%	21.7%	18.3%	24.7%	28.3%	22.5%	35.6%	26.3%	22.4%
Profit margin (after tax)	7.4%	8.7%	6.2%	7.6%	6.1%	6.1%	3.1%	12.5%	5.3%
Solvency ratio*	117%	104%	100%	113%	103%	83%	111%	95%	44%
ROE +	6.2%	8.5%	6.4%	6.8%	5.7%	7.4%	2.6%	13.2%	12.9%

Note: In order to maximise comparability, national aggregated figures have been standardised.

+ Investment yield: in % of average invested assets at market values; ROE: in % of average capital funds.

\* Solvency ratio measures capital leverage calculated as capital funds divided by net premiums earned.

For data sources and definitions see the Appendix.

The average ROE, meanwhile, ranged from 3% to 13%.

The non-life sector in Australia was a positive outlier among the advanced markets, with ROE of 13%.

Sector profitability in China was also higher than in most of the other markets under review.

The average ROE of the markets analysed was between 3% and 13% for the period, with Japan at the lower- and China and Australia at the upper end. The low average profitability of the Japanese market was driven by the very high natural catastrophe losses in 2011 (Tohoku earthquake and tsunami). Excluding this particular year from the analysis, the performance of the Japanese non-life insurers would have averaged 4.7%, not far from the performance of the UK and French markets.

Among the advanced markets, Australia is an outlier. A favourable combination of factors led to high profitability in non-life insurance over the 10-year period. A strong average underwriting result of 4% was complemented by an also-strong net investment result of 13% of premiums. Australia was the only mature economy of the sample that did not suffer a recession during 2008/09 and was therefore able to maintain a significantly higher interest rate (and inflation) environment over the last decade. In addition, a below-average 10-year solvency ratio of 95% boosted industry ROE to 13%. Over this time period, the declining trend in solvency ratios in part reflects market consolidation among the larger players in Australia and, in more recent years, their improved capital efficiency via increased purchases of reinsurance.

The Chinese non-life industry<sup>8</sup> delivered an average ROE of 13% from 2008–2017. On average, the market earned a break-even underwriting result over this period. A few large Chinese companies reported positive underwriting margins, but a large number of the smaller local and foreign players operated with a combined ratio exceeding 100%. Furthermore, there has been increasing pressure on underwriting margins since nationwide motor rate liberalisation measures took effect in July 2016. Motor is the mainstay of the market, accounting for 73% of non-life premiums in 2016. At the same time, investment returns in the Chinese market averaged 7% of premiums, driven largely by increasing investment leverage. The average solvency ratio was low, adding to the positive ROE outcome over the 10 years.

<sup>8</sup> Based on a sample of 51 largest insurers; data from A.M. Best and company annual reports.

# Long-term profitability trends

Three main strategic components.

This chapter investigates the historical trends underlying the three major strategic components of the profitability of non-life insurers - underwriting performance, asset management, and capital management - and the long-term relationship between underwriting and the economic environment. The long-term performance comparison to other sectors is also reviewed.

## Main components of profitability in non-life insurance

Sound underwriting is a prerequisite for overall profitability, especially in the current low-yield environment.

### **(1) Sound underwriting: a prerequisite for overall profitability**

Sound underwriting is a prerequisite for overall non-life insurer profitability and has particularly increased in importance in the current low-yield environment. The underwriting result is driven by the loss ratio and the expense ratio. All functions of the value chain of insurers (other than asset management and capital management), from product design, distribution, risk assessment and selection to policy administration and claims handling – are mirrored through financial accounting in these two ratios.

Loss ratio fluctuations are caused by economic factors, cat losses, claims trends and line-specific cycles.

### **Loss ratios exhibit strong cyclical fluctuations**

Most variation in aggregate underwriting results stems from changes in the loss ratio. Compared to the loss ratio, the expense ratio has been relatively stable in the last 20 years (see below). As discussed further in the next chapter, the loss ratio has exhibited a strong cyclical fluctuation, caused by economic factors, cat losses, claims trends and to some degree line-specific cycles.

There is a significant range of loss and expense ratios, by company and by line of business.

There is a significant range of loss and expense ratios across companies at any point in time, reflecting different business models, different business mixes, and different degrees of efficiency. Different choices regarding marketing, client segmentation, risk selection, pricing and claims administration are factors that lead to the range in loss ratios. The loss ratio is also, of course, influenced by the random fluctuation of losses. Differences in operational efficiency should show up more in the expense ratio. Both loss and expense ratios are strongly auto-correlated, pointing to firm-specific factors which are not random (loss driven).

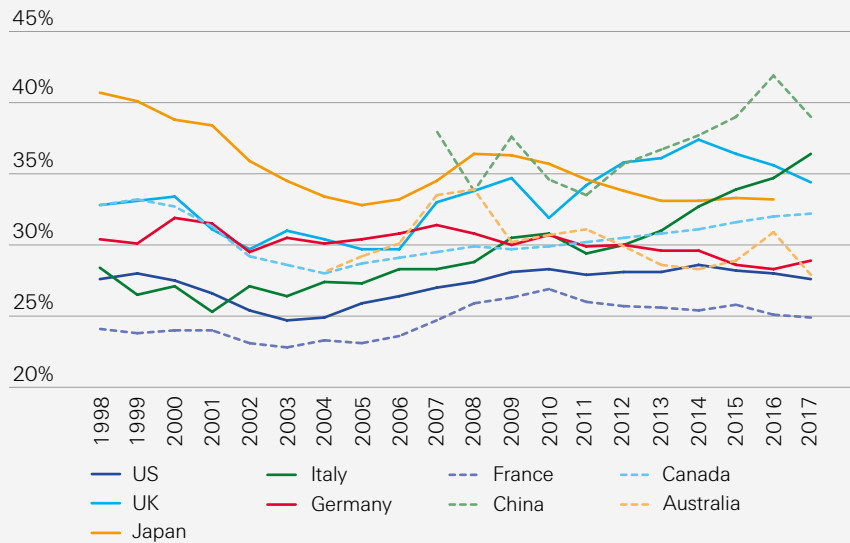
Expense ratios have been relatively stable across a number of markets...

### **Expense ratios have been relatively stable**

Expense ratios have been relatively stable across a number of markets over the past 20 years, but have not followed a uniform trend over the last 10 (see Figure 4). Due to country-specific factors such as business mix and distribution channels, the ratios vary significantly by country, typically ranging from 25% to 35% of premiums. Variation over time is comparatively more limited, with standard deviations between 1 and 2 percentage points (ppt) for the larger mature markets. In most markets, large players have streamlined operations and utilised mergers and acquisitions to increase operational efficiencies. Additionally, there has been a move to more cost-effective distribution channels. The progressive move away from call centres and branch distribution networks for personal lines (car, home and travel insurance products) to online, mobile or digital platform has further contributed to cost reduction.

## Long-term profitability trends

**Figure 4**  
Expense ratios by country,  
1998–2017



Source: Swiss Re Institute

...other than in Italy and China, where they have trended up.

At the same time, expense ratios are exposed to the pricing cycle because premium volumes fluctuate more than expenses, creating some volatility in the observed data. The increase in the expense ratio observed in Italy is essentially the result of falling prices and premium volumes in motor liability insurance, which accounts for around 50% of the non-life market, following legislative reforms to reduce claims frequency and severity. On a normalised basis, the expense ratio would have remained stable like in other markets (see *Long-term unit cost development in the German and Italian motor third-party liability insurance*). Conversely, the rise in underwriting expenses in China was due to strong premium growth (average direct premium growth of 18% in the last decade), driven by the commissions and marketing positions adopted by large insurers grappling with a more competitive environment, alongside further liberalisation of the motor segment in more recent years.

Efficiency gains from the deployment of technology are not yet evident in average market statistics.

In some markets, the absence of measurable efficiency gains from increased use of technology is due to offsetting effects in different business segments. For example in the US, in personal lines business there have been efficiency gains in distribution, underwriting, policy administration and claims, leading to a decrease in expense and commission rates. However, expense rates in US commercial lines have been rising. The increasing complexity of commercial risks requires a growing investment in data and analytics, and this spending can more than offset efficiency gains in operations and claims management. The benefits of technology are also likely to be passed along – at least partially – to clients as part of the competitive process.

In the German motor liability segment, cost per policy has fallen significantly over the past 40 years.

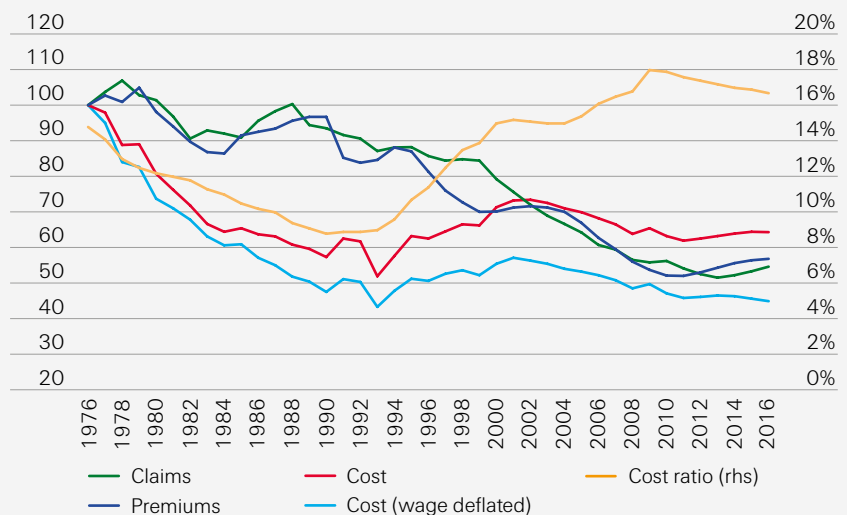
The productivity gains were strongest up until the early 1990s.

### Long-term unit cost development in the German and Italian motor liability insurance business

The insurance industry has long had a reputation for carrying a significant cost load, a perception that has been affirmed by persistently high cost ratios. However, that is not the whole story as the case of German motor liability insurance demonstrates. Figure 5 shows segment premiums, claims and costs on an inflation-adjusted per-risk basis. Over the last 40 years, there has been a significant downward development of all three indicators in Germany. Premiums and claims declined by 1.4% and 1.5% per annum, respectively, while costs (the red line) went down by a seemingly smaller 1.1%. However, to calculate the average productivity gain per policy, it is better to deflate costs by the wage index rather than the consumer price index, because an insurers' cost is mostly driven by personnel expenses. According to the wage-deflated measure, costs declined by 2% per annum over the 40 years.

Productivity gains (reduction of cost per policy) were most significant in the period to the early 1990s. Then followed a soft market period to 2001 which came with a fall in prices after deregulation of EU insurance markets and when insurers profited from windfall gains on the stock markets, but cost per policy went up slightly. In the following period, however, cost per policy declined again at an annual rate of 1.5%.

**Figure 5**  
German motor liability insurance, inflation-adjusted premiums, claims and costs per policy, 1976–2016

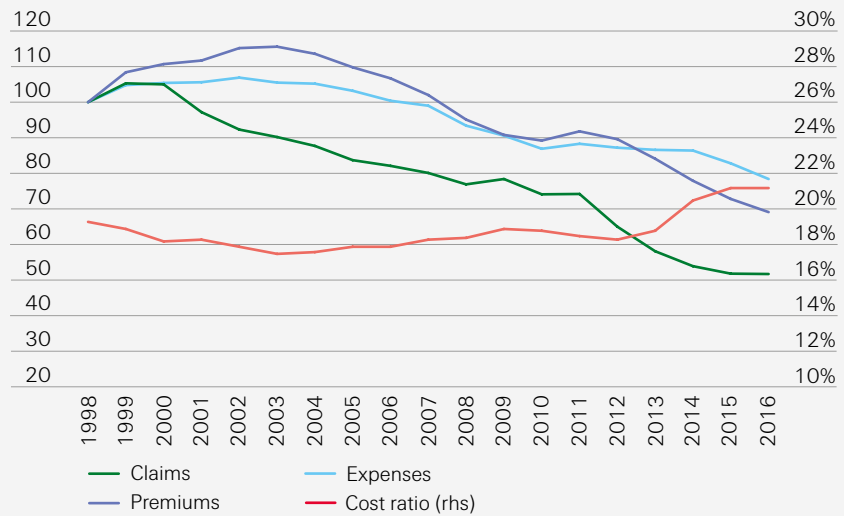


Source: Swiss Re Institute

There has also been a long-term down-trend in unit cost in Italian motor liability...

In Italy, there has also been a long-term downward trend in the unit cost of motor liability insurance (see Figure 6), which suggests that the rising non-life expense ratio shown in Figure 4 mainly reflects strongly declining premium rates. In the last few years, the Italian non-life sector has developed in its own particular way relative to other mature markets in Europe. The main (structural) reason has been the motor insurance business which accounts for more than 50% of non-life premium income, and which has been falling dramatically since 2012. Over five years, the average price of insurance cover (ie, real premiums per policy) in motor third-party liability declined by almost 25%. As Figure 6 shows, premiums followed the claims trend with a lag of one year, with claims starting to decline already in 2011.

**Figure 6**  
Italian motor liability insurance,  
inflation-adjusted premiums, claims  
and costs per policy, 1998–2016



Source: ANIA

...driven by legislative reforms, which have led to a decline in claims frequency and severity.

The decline is partially the consequence of the severe economic recession in Southern Europe after the outbreak of the euro crisis which curbed car use and claims frequency.<sup>9</sup> More important, however, were legislative reforms in Italy to reduce claims frequency and severity, which led to a consistent reduction in claims costs. In particular, the tightening of standards for compensation in connection with micro-injuries related to whiplash, and the widespread introduction of data recording devices (black boxes) have helped bring down costs. In exchange for “sometimes very substantial”<sup>10</sup> premium discounts for insured persons, telematics devices have reduced the risk of fraud and allowed a better determination of damage. Currently more than 20% of motor policies are sold on this basis.

In the accounting view, the contribution to profitability from asset management is represented by the net investment result.

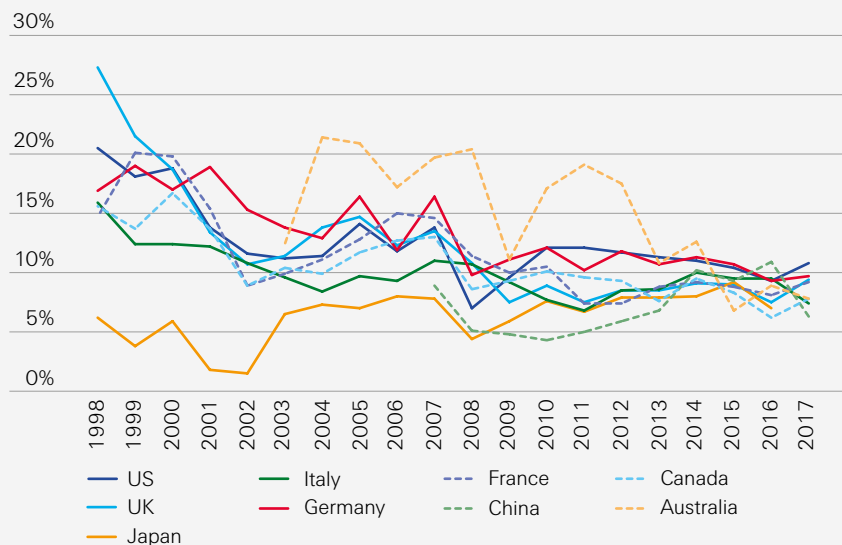
### (2) Asset management: declining contribution to overall profitability

In the accounting view, the contribution to profitability from non-life insurers’ asset management is represented by the net investment result (net investment income and realised capital gains divided by net premiums earned (NPE)). Investment returns relative to premium volumes have declined over the past two decades in most mature markets, from around 15% before the turn of the century to around 10% or less after the global financial crisis (see Figure 7). The exception is Japan, where the investment result has been stagnant for much longer due to the low interest rate environment prevailing in the country for over 20 years.

<sup>9</sup> *Italian insurance 2016/2017: Motor insurance price developments in Italy and Europe: the insurance cycle*, ANIA, pp146-151.

<sup>10</sup> *Ibid*, p150.

**Figure 7**  
**Net investment result as % of NPE**  
**by country, 1998–2017**



Source: Swiss Re Institute

Falling investment yields have resulted in a decline in the net investment result.

The net investment result is jointly determined by asset leverage (total invested assets divided by NPE) and total investment yield (net investment income and realised capital gains divided by invested assets). Over the last two decades, these two components have moved in roughly the opposite direction. In a continuation of longer-term trends, asset leverage rose in the first decade of this century and then flattened in most major markets. However, the asset leverage trends were more than offset by falling investment yields, resulting in a decline in the net investment result.

The fall in investment yields largely reflects the secular decline of interest rates.

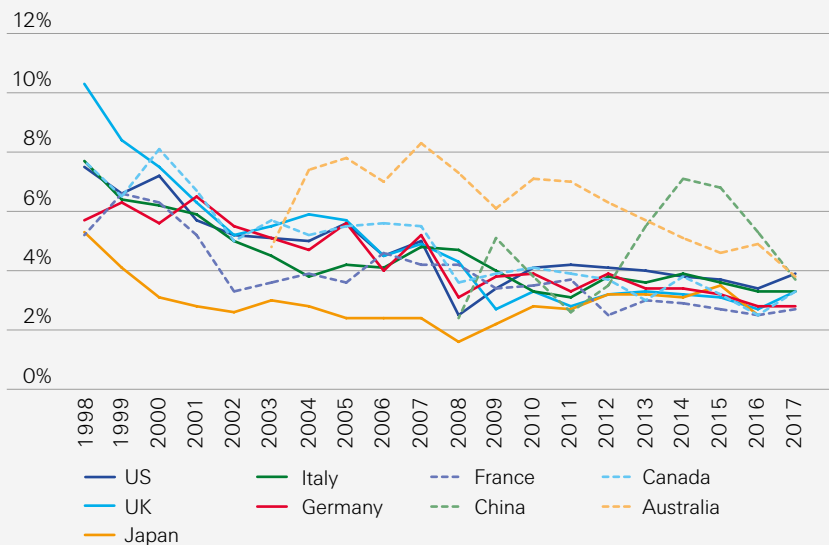
In mature markets, investment yields have decreased from 5–10% twenty years ago to 3–4% today (see Figure 8). The main reason for the downward trend has been the secular decline of interest rates. At first this was driven by disinflation. After the financial crisis, the impact was compounded by central banks embarking on unconventional monetary policy measures to stabilise the market environment and enforcing an extreme low interest rate environment. Another factor was the changing investment policy of the insurance industry after the stock market bubble burst in 2000–2002. As a result, and due to changing requirements from regulators and rating agencies which attributed higher risk charges for equity investments, the insurance industry's invested asset allocation has moved further towards fixed income securities which have a relatively lower yield than equities. In emerging China, the average investment yield for the last decade was 4.6%.

In Japan, investment yields fell earlier than in other mature markets.

The trend towards lower investment yields has been similar across mature markets. Once again, the main exception is Japan where long-term bond yields have been low for 20 years, such that local insurers have earned just 3% investment yield over the last two decades. The domestic investment environment became even more challenging for Japanese insurers after the Bank of Japan adopted a negative interest rate policy in February 2016.

## Long-term profitability trends

**Figure 8**  
Net investment yield by country,  
1998–2017



Note: In Canada, the net investment yield includes unrealised capital gains which are not reported separately. In all other markets, the investment yield includes net investment income and realised capital gains, but excludes unrealised capital gains.

Source: Swiss Re Institute

Australia and China have been outliers in terms of positive investment yields.

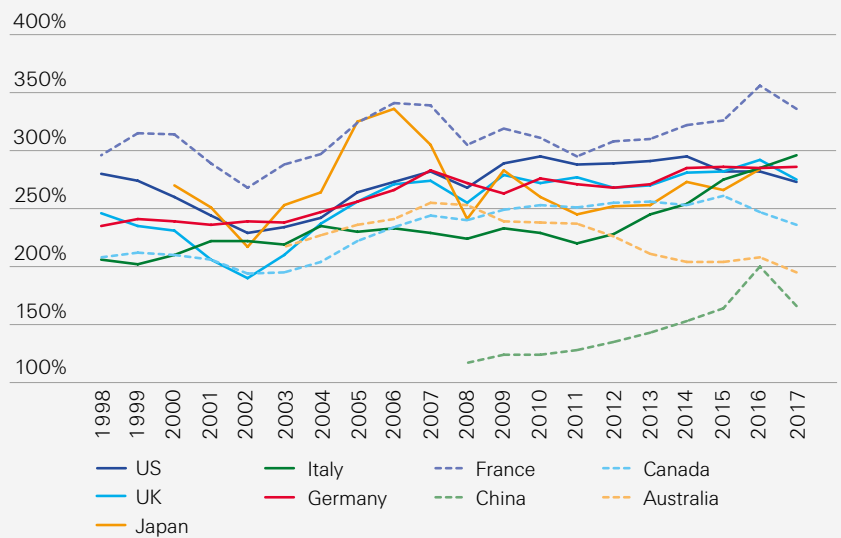
The other outliers in terms of investment yields – to the positive side – are Australia and China. In Australia, interest rates and investment yields remained comparably high after 2008 since the country was one of the few to avoid a recession during that time. However after 2011, unemployment increased gradually and inflation declined, and the Reserve Bank of Australia progressively lowered the policy rate, leading to a gradual decline in insurers' investment yields. In China, investment yields have been boosted by a broadening of investment channels and greater flexibility in asset allocation for insurance funds since 2014. China's insurers have adopted more active investment strategies, in particular after the further relaxation of rules on investing in the stock market in July 2015. However, in January 2017, the Chinese regulator tightened requirements by putting a cap on insurers' investments. Insurers may now invest no more than 30% of their total assets in stocks.



Asset leverage rose in the first decade of this century, but has since stabilised in many major markets.

Asset leverage – the volume of investment activity in relation to underwriting activity – is the second major driver of investment income generation. In a continuation of longer-term trends, asset leverage increased in all major markets during 2000–2010, before stabilising in more recent years (see Figure 9). In 2017, in the US and Canada, asset leverage was roughly 10 ppt below the prior decade’s average. In Australia, it fell more strongly. The most recent asset leverage readings in Europe were in line with or somewhat above the average of the previous 10 years.

**Figure 9**  
Asset leverage by country, 1998–2017



Source: Swiss Re Institute

Technical reserves arising from the underwriting activity are the most important source of assets to invest.

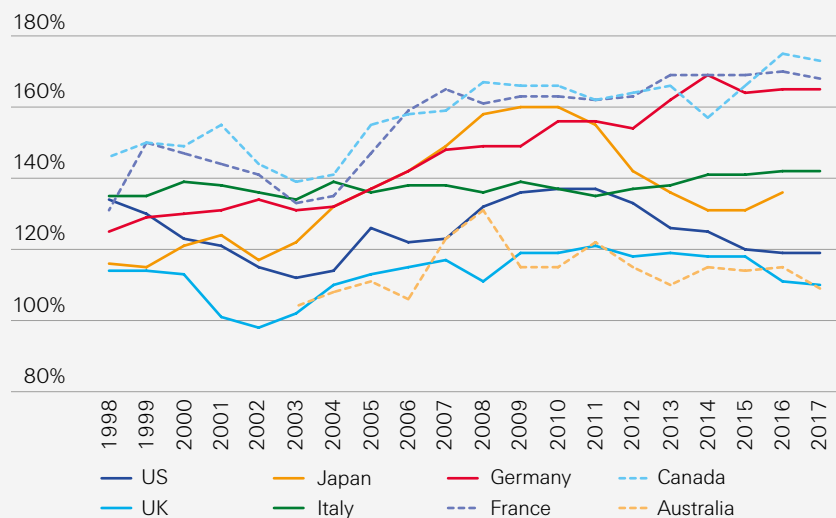
Asset leverage is driven by trends in both reserve and solvency ratios, the two key sources of funding for most non-life insurers’ assets. Technical reserves generated out of underwriting activity are the most important source of funding for investment. Premiums are received before losses are paid, creating a period during which the funds can generate investment returns for an insurance company. The length of that interval varies with the type of insurance business and can extend over many years for long-tail lines, such as liability insurance. The accounting reflection of this is the amount of technical reserves (loss reserves, loss adjustment reserves, and reserves for unearned premiums).

## Long-term profitability trends

The loss reserve ratio has been flattening out in many key markets over the past 10 years, driven by benign trends in claims and inflation.

The development of funding through technical reserves is assessed by looking at loss reserve ratios (loss reserves as a percent of net premiums earned). In many of the major markets, the loss reserve ratio has flattened out over the past 10 years, driven by benign claims and inflation trends (see Figure 10). In the US, the UK, Japan and Australia, the ratio in 2017 was below the prior decade's average, whereas in France, Italy, Germany and Canada it was modestly above. For several decades prior, the loss reserve ratio had risen along with the increasing importance of liability lines of business, higher inflation for indemnified services, such as medical care, and mounting litigation costs.

**Figure 10**  
Net loss reserve ratio by country, 1998–2017



Note: the figure excludes China, which had an average net reserve ratio of around 30% over the last decade.

Source: Swiss Re Institute

Shareholder funds are the second key funding source of investments in financial assets.

Insurers' shareholders' funds, which are kept as risk capital, are the second key source for investments in financial assets. The development of insurers' solvency ratios is discussed further in the next sub-section.

An insurer's solvency ratio indicates how much capital underlies a given volume of transacted business.

### (3) Capital management: a trade-off between security and profitability

The solvency ratio or capital leverage, calculated as capital funds divided by net premiums, is the third strategic driver of non-life insurers' profitability.<sup>11</sup> It indicates how much capital underlies a given volume of transacted business in a company or market. This ratio largely reflects the inherent risk profile of the business, and the level of security that management, investors, regulators and rating agencies require. There is a trade-off between security and profitability: the higher the level of capital funds used to secure the risk exposure of each premium unit, the higher the level of after-tax profit margin needed to arrive at the same ROE.

<sup>11</sup> For the purposes of profitability analysis, we define the solvency ratio as a simple metric for capital leverage. Under recently implemented risk-based solvency regimes such as Solvency II in the European Economic Area, C-ROSS in China and the Prudential Capital Requirement (PCR) in Australia, the solvency ratio is calculated as the relation between required capital, which is based on a holistic risk assessment, and available capital resources. As the capitalisation of the insurance industry generally exceeds the regulatory solvency requirements, those newly imposed requirements had no significant impact on the capital leverage of non-life insurance companies.

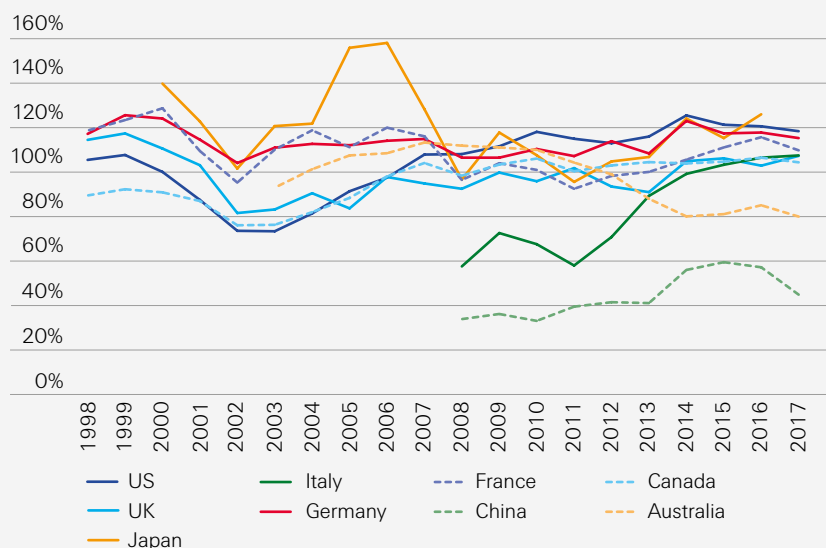
Solvency ratios differ by market and by legal status.

Solvency ratios have levelled off in a number of countries in more recent years, ending a longer-term upward trend.

The comparability of solvency ratios between companies and markets can be difficult. A solvency ratio considered high by one company may be appropriate for another. An important factor is the volatility of the underlying business. High exposure to natural catastrophes, high competition with significant underwriting cycles, and potentially disruptive changes to the legal (liability regime) environment are factors that necessitate a higher capital buffer. Another more structural reason for differences in solvency ratios is the ownership structure of a company. Stock companies tend to have lower solvency ratios than mutuals or public-law insurers. In Germany, the 10-year average solvency ratio for stock companies is around 90%, whereas the average for mutual and public-law insurers is around 150%. Stock companies pay dividends to shareholders. The two other types retain a larger share of profits which over time leads to higher solvency ratios.

Solvency ratios have risen significantly across most advanced markets over a long period of time. For example, the non-life solvency ratio in the US and Canada in 1975 was at around 40%. By 2017, it had risen to 117%<sup>12</sup> and 104%, respectively, although rate of increase has levelled off in more recent years. Nevertheless, these latest solvency ratios are modestly above prior-decade averages. Non-life solvency ratios of the major markets have developed mostly in parallel since 2008 (see Figure 11). The main outlier has been Australia, where solvency levels declined to 80% by 2017. This was in part due to market consolidation among larger players and their increased strategic use of reinsurance as a capital substitute, especially in the past few years. The other developed market outlier is Italy: solvency ratios have increased in recent years due to restructuring among larger companies and higher retained earnings, while premium income has declined at the same time. Finally, in China, the average solvency ratio of the last decade was 40%, much lower than that of the advanced markets. This in part reflects the industry's less risky product portfolio, the main focus being motor. That said, solvency ratios in China have been rising largely as a result of capital injections by investors, especially among smaller players which reported negative retained earnings for many years. It is only in the last few years that the rise in solvency ratios has been backed by an increase in retained earnings.

**Figure 11**  
Solvency ratios by country, 1998–2017



Source: Swiss Re Institute

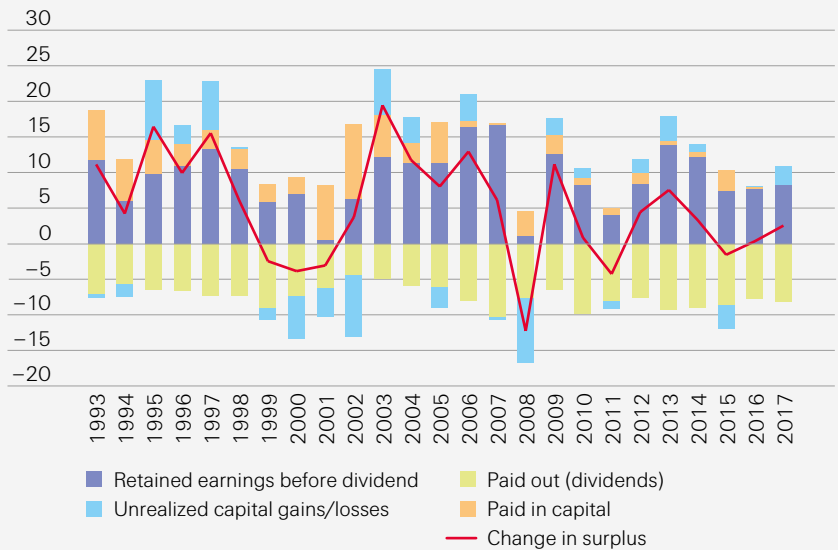
<sup>12</sup> Excluding National Indemnity Company.

## Long-term profitability trends

Strategic capital management also has an impact on insurers' solvency ratios and ROE.

Strategic capital management – raising capital at appropriate times, and returning funds to shareholders in the form of dividends – impacts insurers' solvency ratio and hence ROE. Insurers generate funds through retained earnings, paid-in capital and unrealised capital gains, and distribute funds to shareholders via dividends. As can be seen from US statutory data,<sup>13</sup> non-life stock companies have collectively increased the share of funds returned to shareholders in the past decade. The average dividend was 8.4% of average capital funds from 2006–2017, compared to 6.5% for 1993–2005. In particular, over the last five years US non-life stock companies paid out an average 80% of net profit to their shareholders and retained only 20% to fund further growth. Meanwhile, the amount of new capital flowing into the traditional sector has slowed, from an average of 4.9% of capital funds in the earlier period, to just 0.4% in the last five years (see Figure 12).

**Figure 12**  
Drivers of the change in capital funds (as % of average surplus) for US non-life stock companies, 1993–2017



Source: A.M. Best

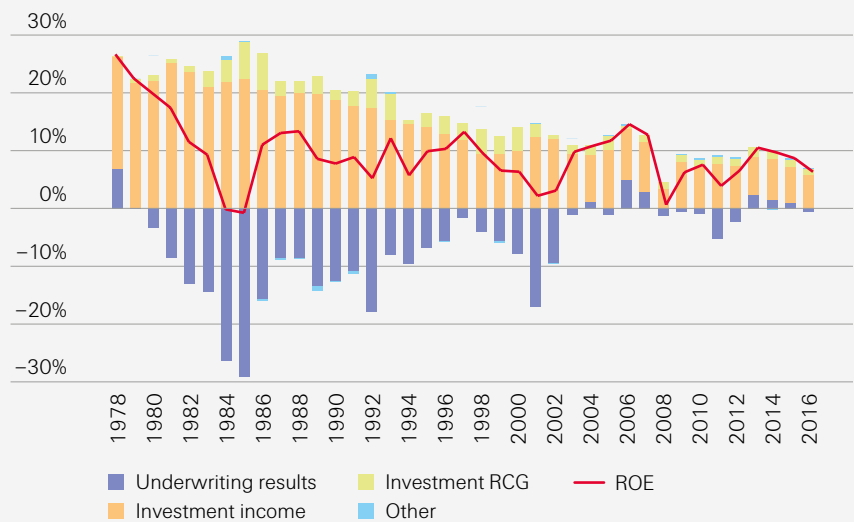
<sup>13</sup> Stock companies, excluding National Indemnity Company.

## Underwriting profitability and economic environment: a long-term relationship

A changing balance between a number of drivers generates overall profitability for non-life insurers.

The accounting view of insurer of profitability separates out a number of components. However, in the real world all parts of ROE generation are connected with each other through market forces and the macroeconomic environment. In an economic view, underwriting and investment results work together to generate an insurer's overall profitability (see Figure 13). For example, in the past higher investment returns have been partially offset by larger underwriting losses. See *Profitability drivers of US non-life insurers* for more on the interplay of a number of different drivers of profitability.

**Figure 13**  
US non-life insurance investment and underwriting results, and ROE, 1978–2016



Note: RCG = realised capital gains/losses.

Source: A.M. Best, Swiss Re Institute

We analysed all profitability drivers for US non-life insurers concurrently, utilising multi-variable panel data regressions.

### Profitability drivers of US non-life insurers

To disentangle the impact of a number of profitability drivers that work concurrently to determine a non-life insurer's ROE, we used multi-variable panel data regression models on statutory data for roughly 600 US non-life companies from 2007 to 2017.<sup>14</sup> As the price cycle and loss shocks from natural catastrophes are significant drivers of underwriting profitability, adjustments were made for both in the analysis. In particular, an average commercial insurance price index was used to control for the price cycle,<sup>15</sup> and an index of nat cat losses as a percentage of net premiums earned to control for cat losses.<sup>16</sup> Insurers' ROE is also significantly influenced by the performance of the stock market, which we controlled for with the performance of the S&P 500 index. We further controlled for capital leverage, asset leverage and share of equity investments.

<sup>14</sup> Data source is A.M. Best. From initially 1464 independent insurance companies or groups, we filtered out smaller companies and outliers with regards to the analysed metrics. This brought the number of companies down to 600 to 650, depending on the models used.

<sup>15</sup> Based on data from the Council for Insurance Agents and Brokers and Swiss Re Institute.

<sup>16</sup> Based on data from A.M. Best and Swiss Re Institute.

## Long-term profitability trends

Direct response writers have lower expense ratios and higher ROEs.

Insurers **distributing** their products **directly** have lower expense ratios than insurers using independent agencies and brokers. In the US, personal lines carriers increased their use of direct distribution channels from 7% of premium volumes to 16% between 1995 and 2015.<sup>17</sup> After controlling for differences in business mix and company size, there was also a statistically significant positive impact on the underwriting margin and ROE for direct writers.

There are specialisation benefits for underwriting profitability.

The analysis also reveals that **specialisation** in specific lines of business and **geographic focus** are associated with lower expense ratios and higher underwriting margins. In the presence of variables controlling for distribution channels, business mix and insurer size, product diversification does not explain overall performance. Firms that tend to focus in certain states, rather than provide broad coverage across all states, outperform marginally in terms of ROE.

There are economies of scale with regards to underwriting and capital management.

There are **economies of scale** in terms of acquisition and underwriting expenses. In particular, larger companies tend to have lower expense ratios. After controlling for differences in the business written and distribution channels, there was also a significant scale effect in terms of the underwriting margin. Furthermore, there are economies of scale relating to capital management. Larger firms deploy less capital relative to their premium volume. Therefore, overall profitability is higher for larger companies.

Mutuals have a different objective from pure profit maximisation.

Stock companies have historically outperformed mutuals on the basis of accounting ROE. However, on average mutuals have lower cost of capital, less capital leverage and write more personal lines business, which makes the direct comparison difficult. Policyholders own mutuals and get some return on their membership returned by means of lower premiums, policyholder dividends or higher loss payments. After controlling for variables that describe the different business that stock companies write on average, the ROE for US stock companies was only 1 to 2 ppt higher than that for mutuals.

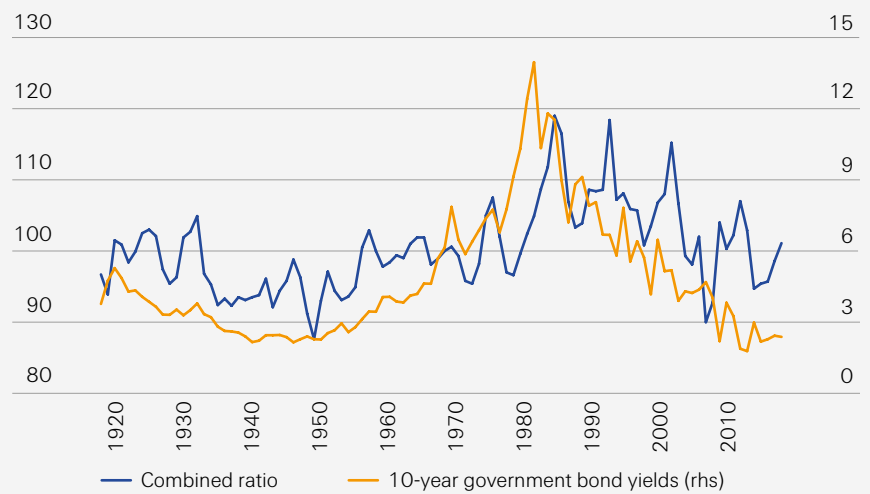
Insurance costing tools forge a direct link between interest rates and non-life underwriting results.

A key interplay between non-life insurers' profit drivers with market forces is the relationship between interest rates and underwriting results (see Figure 14). This result is well established through insurance pricing theory: discounting cash flows when setting premium rates directly links interest rates to underwriting performance. Since insurance premium inflows and claims costs outflows occur at different points in time, interest rates and insurance prices have a negative relationship. If insurers update pricing on a regular basis, and reflect updated forecasts of interest rates in the pricing decisions, higher interest rates would imply a bigger impact from discounting and thus a lower price.<sup>18</sup>

<sup>17</sup> Ten key findings of the 2016 Agency Universe Study, IABSC, 2017.

<sup>18</sup> Haley, J.D., *Further considerations of underwriting margins, interest rates, stability, stationarity, cointegration, and time trends*. Journal of Insurance Issues, 2007, pp.62-75.

**Figure 14**  
US stock company combined ratio (%) and 10-year government bond yield (%), 1918–2017



Source: A.M. Best, Datastream, Swiss Re Institute

Furthermore, higher interest rates bolster investment returns and encourage cash-flow underwriting.

Furthermore, higher interest rates boost investment returns. A strong investment result allows insurers to be more aggressive in pricing new business, as underwriting losses can be more than offset through investment income without risking overall profitability. This is commonly referred to as “cash-flow underwriting”. Thus as market forces induce insurers to compete on price, underwriting results tend to deteriorate while investment income rises.<sup>19</sup> Conversely, during a time of falling interest rates and deteriorating investment yields, underwriting results tend to improve and there is less discount impact on pricing.

Empirical analysis confirms a long-term relationship between the combined ratio and interest rates.

Empirical analysis across the major markets<sup>20</sup> using data on combined ratios,<sup>21</sup> consumer price inflation and interest rates from 1977 through 2017 confirms the relationship. Using an autoregressive fixed-effects model, we checked for the influence of an endogenous pricing cycle (explained by momentum in the market) and the exogenous macroeconomic variables that drive general claims inflation on the one hand, and discount rates and investment income on the other. In line with prior research,<sup>22</sup> we found that real interest rates and consumer price inflation are significant variables in explaining combined ratios and underwriting margins, respectively. In particular, there is a strong long-term relationship between the combined ratio and nominal interest rates.

However, changes in interest rates are not a meaningful driver of the cycle in the short-term context.

However, the relevance of these interactions becomes very small when looking at changes in interest rates and the impact on combined ratios. This means that in contrast to a significant long-term relationship, interest rates play only a minor role in explaining short-term changes in underwriting metrics.

<sup>19</sup> A negative relationship between underwriting profitability and interest rates means a positive relationship between interest rates and the combined ratio (which is the mirror image of the underwriting result).

<sup>20</sup> Excluding China.

<sup>21</sup> Combined ratios for Australia are from 2003–2017, for Italy from 1998–2017, and for Japan from 1977–2016.

<sup>22</sup> Boubaker, H. and Sghaier, N., “How Do the Interest Rate and the Inflation Rate Affect the Non-Life Insurance Premiums?”, *Bulletin Français D’Actuariat*, vol. 12, 2012, [http://www.ressources-actuarielles.net/EXT/IA/sitebfa.nsf/0/5DE60207B68B854DC1257AA3006D3B0F/\\$FILE/24\\_Article4.pdf?OpenElement](http://www.ressources-actuarielles.net/EXT/IA/sitebfa.nsf/0/5DE60207B68B854DC1257AA3006D3B0F/$FILE/24_Article4.pdf?OpenElement). See also *sigma* 4/2010: The impact of inflation on insurers, Swiss Re.

## Long-term profitability trends

Over the long run, P&C insurance stock companies have delivered a level of profitability comparable with firms in other sectors.

Most US P&C firms had higher ROE than L&H and bank counterparts over the past 10- and 20-year periods.

### Long-term performance relative to other sectors

Over the long run, insurance stock companies have delivered a level of profitability comparable with firms in other sectors. In comparing the long-run ROE of the P&C sector to other industries, the choice of benchmark indices and time periods matters. In the broadest comparison, all US P&C stock companies as a group<sup>23</sup> underperformed the S&P 1500 over the previous 10 years in terms of average ROE (see Table 3). More narrowly, large-cap P&C companies appear to have underperformed the S&P 500 large-cap index over both the 10- and 20-year windows. At the same time, mid-cap P&C firms outperformed over the longer term but underperformed over the past 10 years versus the S&P 400 mid-cap index, and small-cap P&C firms had a higher ROE than the S&P 600 small-cap index in both periods.

In contrast, P&C firms of all sizes had a higher ROE on average than their Life & Health (L&H) and bank counterparts over both the 10- and 20-year horizons, with the exception of the mid-cap L&H index over the prior decade, and large-cap banks over the longer period. The longer horizon includes losses (including adverse development) from the prolonged soft market of the late 1990s and unanticipated catastrophe losses from the World Trade Center attacks and Hurricane Katrina. The most recent 10-year period includes the aftermath of the global financial crisis, the resultant low interest rate environment, and an influx of AC in search of yield.

**Table 3**  
Average ROE of US stock companies, 1998–2017

Average ROE	10 years	20 years
US P&C stock companies	7.9%	9.0%
S&P 1500 index	11.9%	not available
Large-cap P&C companies	8.6%	10.1%
Large-cap L&H companies	7.8%	9.0%
Large-cap banks	5.9%	11.0%
S&P 500 large-cap index	12.6%	13.3%
Mid-cap P&C companies	6.8%	10.5%
Mid-cap L&H companies	7.3%	9.1%
Mid-cap banks	5.2%	9.4%
S&P 400 mid-cap index	8.0%	9.3%
Small-cap P&C companies	7.9%	8.8%
Small-cap L&H companies	6.3%	7.7%
Small-cap banks	4.2%	8.5%
S&P 600 small-cap index	4.9%	6.6%

Note: Data by sector from Bloomberg (L&H, P&C, banks) is for companies within the respective S&P indices. The Bloomberg P&C indices do not include Berkshire, AIG or Hartford, which are classified as Diversified Financials (Berkshire) and Multiline Insurers (AIG, Hartford).

Source: A.M. Best, Bloomberg, Swiss Re Institute

There are caveats to direct comparability of ROE for the P&C indices and their respective S&P benchmarks.

Some caveats limit the direct comparability of the ROEs for the P&C industry and the respective S&P benchmarks. In particular: (1) capital-intensive industries outside the financial sector leverage debt to finance their assets; and (2) the balance sheets and shareholder equity of most service companies do not include significant intangible assets like customer relationships, data and brand name etc. thereby inflating the ROE metric. By contrast, non-life insurers hold capital as a buffer for unexpected claims costs and operations are mostly self-funded by the cash-flow of premiums, which are paid up front.

<sup>23</sup> Statutory ROE data from A.M. Best, vs Bloomberg ROE data for all other categories/indices.



Differences in the relevance of equity as a metric of a firm's productive assets are reflected in price-to-book ratios.

Similarly to profitability trends, the P&C industry's stock market performance has been comparable to market benchmarks over the long run.

These differences in the relevance of equity as a metric of a firm's productive assets are reflected in the price-to-book ratios. Price-to-book ratios ranged between 3 and 5 for sectors such as materials, health care, industrials, information technology, and consumer staples over the last five years in the S&P 500 index.<sup>24</sup> The average price-to-book ratio for US P&C insurance was 1.4 by comparison.

Similarly to the cross-sector comparison for profitability, the stock market performance of P&C insurers and the S&P index companies were roughly in line from 1998 through 2017. Table 4 shows the average performance of the Standard & Poor's P&C insurer total return indices compared to the life insurer indices, the bank indices and the S&P benchmarks.

**Table 4**  
Average stock market performance of US companies in the S&P 1500, 1998–2017

Average total returns	10 years	20 years
Large-cap P&C companies	9.9%	8.9%
Large-cap L&H companies	9.5%	9.3%
Large-cap banks	6.2%	6.9%
S&P 500 large-cap index	9.3%	8.9%
Mid-cap P&C companies	11.7%	13.9%
Mid-cap L&H companies	19.3%	17.4%
Mid-cap banks	4.2%	8.0%
S&P 400 mid-cap index	11.0%	12.4%
Small-cap P&C companies	8.6%	11.2%
Small-cap L&H companies	5.0%	9.3%
Small-cap banks	5.9%	9.1%
S&P 600 small-cap index	11.0%	11.5%

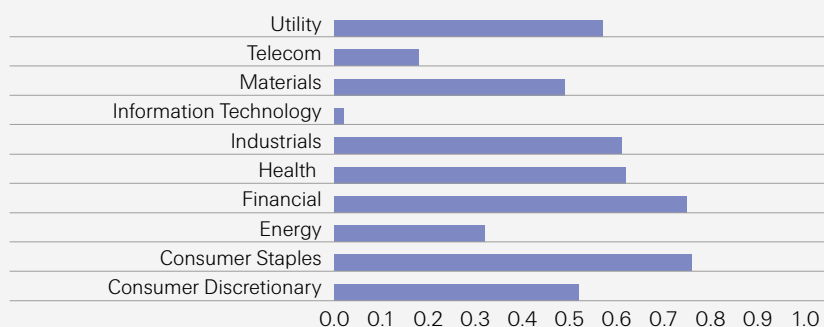
Note: Data by sector from Bloomberg (life, P&C, banks) is for companies within the S&P 500 index, not for all listed companies in each sector (ie, the performance of small- and mid-cap companies is not captured).

Source: Bloomberg

Insurance stocks add value through diversification.

A second component of investor attraction is how and to what extent a sector adds diversification benefits to a portfolio. As seen in Figure 15, the P&C index has a relatively low correlation with some of the other industry segments of the S&P 500, especially technology and telecommunications. Insurance stocks are thus deemed an attractive addition to a diversified investment portfolio.

**Figure 15**  
Correlation of price returns for the S&P 500 P&C insurance index with other S&P sub-segments, January 1998 – May 2018



Source: Bloomberg, Swiss Re Institute calculations

<sup>24</sup> Data from Bloomberg.

## Long-term profitability trends

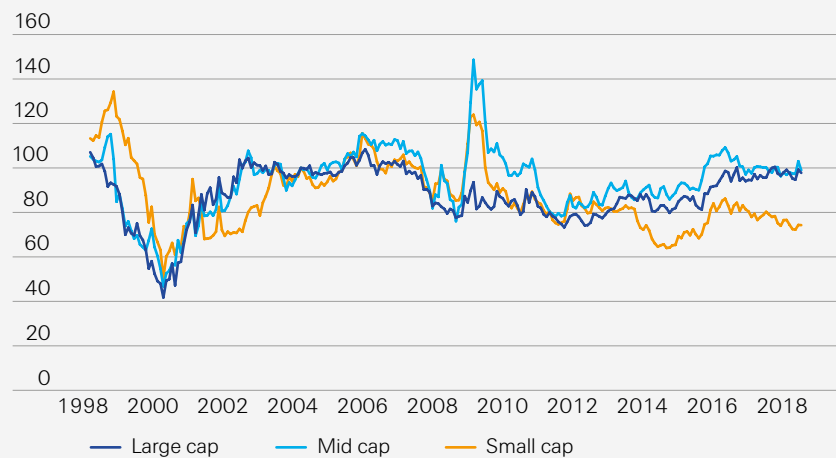
A number of interesting observations can be gleaned from a detailed comparison of the P&C sub-indices to the benchmarks.

Figure 16 compares the development of US P&C insurance sub-indices to the full benchmark samples of large-, mid- and small-cap companies. We also ran statistical models of these three valuation metrics against explanatory variables on profitability, interest rates and inflation. There are a few noteworthy observations.

- Over long periods of time (eg, 2001–2008 and 2010–2015), there was no substantial difference in performance, except for small caps. Small-cap insurer valuations have been under more pressure since 2014 than those of larger insurers, as reflected by a smaller variation from the market index for large caps.
- Insurers underperformed during the internet bubble (1999–2000) and outperformed during the financial crisis (2008–2009). Non-life insurance is a diversifying sector compared to the technology and telecom segments, and has a low correlation with many other industries.
- Interest rates are positive valuation drivers. Inflation and inflation expectations are mostly negative ones.
- The underwriting cycle has only weak influence on relative valuations. On the one hand, this can be due to the lags between writing business and full development of claims costs, distortions from catastrophic losses and uncertainties about claims trends. Changes in the pricing cycle do not immediately change common P&C valuation metrics such as book value per share or earnings per share. On the other hand, investors are forward looking and may focus on over-the-cycle results.

**Figure 16**

P&C insurers' price indices relative to the S&P segment, January 1998 – May 2018 (January 2004=100)



Source: Bloomberg

# The non-life insurance profitability cycle

The non-life insurance sector's profitability cycle is a recurring pattern of ups and downs in prices and underwriting profits.

A review of combined ratios across major non-life markets shows the existence of underwriting cycles.

Driven by a rise in globalisation, we would expect underwriting cycles to be increasingly correlated.

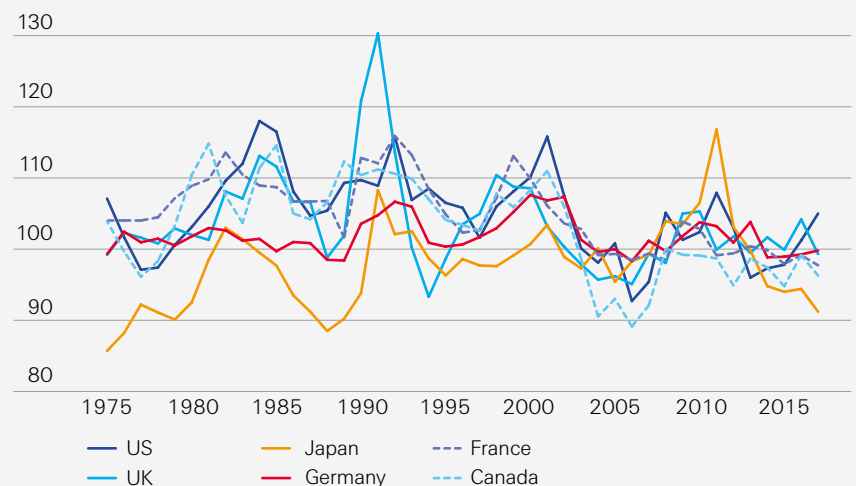
Historically, the overall profitability cycle of the non-life insurance sector has been a recurring pattern of ups and downs in industry prices and underwriting profits. During "soft market" periods, insurance is readily available, capacity is abundant and prices fall, leading eventually to diminishing profits. In "hard markets", coverage is harder to obtain and prices rise, sometimes sharply, which helps restore profitability.

A number of previous studies have utilised statistical techniques to show the existence of underwriting cycles across the major non-life markets.<sup>25</sup> Based on a review of the up-to-date histories of combined ratios across six markets, we find that average trough-to-trough cycle length ranges from about six to nine years.<sup>26</sup> These data also show that although cyclical in business-year combined ratios persists, the cycle seems to have lengthened since the early 1980s, when central banks changed their policy focus toward fighting inflation and many areas of the financial services industry were deregulated.

## Correlation of combined ratios across countries and lines of business

If underwriting cycles are influenced by exogenous economic factors and economies are more integrated globally, we would expect a rise in the correlation of underwriting cycles across countries. Increasing globalisation of the re/insurance industry would also contribute to a convergence of markets toward one underwriting cycle. However, at first glance, a longer time series of combined ratios from 1975–2015 revealed a mixed picture (see Figure 17). Some markets – such as the US and Canada – seemed to correlate closely, while others like Germany and Japan followed more independent patterns.

**Figure 17**  
Business-year combined ratios of major markets, 1975–2017



Note: Australia, China and Italy are excluded from the figure because an equivalently-long history of data is not available.

Source: Swiss Re Institute

<sup>25</sup> See for example, Cummins, J.D. and Outreville, J.F. "An International Analysis of Underwriting Cycles in Property-Liability Insurance" *Journal of Risk and Insurance*, June 1987, pp. 245–262; Harrington, S.E. and Niehaus, G. "Volatility and Underwriting Cycles" in Dionne, G ed., *Handbook of Insurance*, 2000. See also *sigma* No. 5/2001, Swiss Re.

<sup>26</sup> The six markets are the US, Canada, UK, Germany, France and Japan.

## The non-life insurance profitability cycle

International correlation of underwriting cycles was higher in the past 20 years than from 1975–1995.

Operating ratios within categories of property and casualty lines are more correlated than those across categories.

An assumption is that correlation has strengthened over time with more integrated capital markets. This should be particularly so in continental Europe following the deregulation of insurance markets there from 1996, which removed rate and form requirements and facilitated cross-border business. To test this hypothesis, we split the business-year combined ratio time series into pre- and post-1996 samples, and looked at the average of pairwise correlations between the US, Canada, UK, Germany and France.<sup>27</sup> We found that the average pairwise correlation between these markets was significantly higher in the post 1996 period, confirming the hypothesis that the international correlation of underwriting cycles was stronger over the past 20 years (1996–2017) than over the two decades previous (1975–1995).

Another question is whether there are different cycles for different lines of business. The less correlated they are, the better the diversification of underwriting results across different market segments, which would lower the cost of capital for more diversified insurers. We analysed operating ratios<sup>28</sup> of major US lines of business for this purpose. While we saw a general cyclical pattern, there was still a great deal of variation due to cat losses and to some degree line-specific pricing cycles. On average, correlations are higher between categories of property lines – due to common exposures to cat losses – and between categories of casualty lines. As expected, correlations are lower between P&C lines as groups (see Figure 18).

**Figure 18**  
Correlations across operating ratios for major US lines of business, 1976–2016

		Casualty lines					Property lines			
		Personal auto	Comm auto	Workers comp	General liability	Med mal	HMP	CMP	Fire & Allied	Inland marine
Casualty	Personal auto	1.00	0.63	0.68	0.51	0.38	0.28	0.44	0.12	0.08
	Commercial auto		1.00	0.34	0.56	0.51	0.28	0.78	0.31	0.54
	Workers comp			1.00	0.53	0.21	0.42	0.44	0.04	0.02
	General liability				1.00	0.53	0.46	0.74	0.25	0.22
	Medical malpractice					1.00	0.12	0.41	-0.04	0.11
Property	HMP						1.00	0.69	0.60	0.62
	CMP							1.00	0.56	0.70
	Fire & Allied								1.00	0.69
	Inland marine									1.00

Note: HMP = homeowners' multi-peril, CMP = commercial multi-peril. Dark green = strongest correlation; dark red = weakest correlation.  
Source: A.M. Best, Swiss Re Institute

<sup>27</sup> Italy, Australia and Japan are excluded from this analysis. We did not have a sufficiently long series of historical data for Italy; Australia and Japan's correlations were distorted by the 2011 catastrophes.

<sup>28</sup> To take into consideration the time value of money, which impacts long-tail lines more than short-tail lines, we allocated a portion of investment income to the underwriting result for each line of business, based on average loss reserve ratios and a 3-year risk free interest rate.

## What drives the underwriting cycle?

The supply of non-life insurance is driven largely by capital.

The supply of non-life insurance is driven largely by capital. In the long run, most capital growth is organic and comes from within the industry through retained earnings and capital gains on invested assets. Capital can increase more (or less) if underwriting losses are lower (or higher) than expected. New capital enters the insurance industry through start-ups, often based offshore, and through capital injections into incumbent insurance carriers. In addition, alternative risk transfer vehicles such as captives, risk retention groups, and index-linked securities complement and compete with the traditional supply from insurers. Exits of capital generally take the form of net losses, dividends to shareholders and share buybacks.

Non-life insurance capitalisation has remained roughly stable over the last four years.

The amount of non-life insurance capital in our sample of nine major markets grew from below USD 900 billion by the end of 2007 to around USD 1090 billion a decade later. The average growth over the 10 years was 2.3%, approximately in line with the rate of average annual premium growth. The period included the global financial crisis in 2008/09, the high cat losses of 2011 and 2017, and a more active capital management strategy by many insurance companies to avoid huge overcapacity. The decade before saw a slightly stronger increase in solvency ratios in spite of the massive loss in capital during the stock market meltdown of 2001/02. By contrast, in the latest four years, non-life capitalisation has remained roughly stable.

Changes of and ambiguity relating to claims trends alter the capacity provided relative to available capital.

Although the terms capital and capacity are often used interchangeably, it is important to differentiate the two. Changes in claims trends or expected losses alter the relationship between industry capital and capacity offered to the market. A rise in expected losses and higher parameter uncertainty about the loss expectation can lead to reduced capacity, even if the overall amount of capital remains the same. Insurers must hold additional capital for these unexpected losses, thus removing capacity from the market. The most severe hard market was the US liability crisis in the mid-1980s, which was triggered by a strong increase in liability claims frequency and severity. Also, Hurricanes Andrew (1992) and Katrina (2005), and the WTC loss (2001) revealed unrecognised or un-modelled risks which caused capacity shortages and rate hardening in the property cat segment, with far-reaching repercussions into the primary insurance market. The events of the 2017 cat season fell more within the range of expected model outcomes.

High investment yields can also lead to more competitive behaviour.

Investment yields are also an important external factor determining re/insurance prices. In the past, high investment returns have encouraged cash flow underwriting and fuelled soft markets, most notably from 1997 to 2000. However, the low-yield environment of the last decade has largely discouraged this strategy. Instead, the market has been softening even with low yields, due to excess capacity and benign claims trends.

Insurance pricing only moves gradually.

A final important market force is momentum. Premium rate trends change only gradually and depend strongly on the prior year's dynamic, a factor that is institutional in markets where rates require regulatory approval. The time period from when claims trends materialise to the filing for rate changes based on these trends and implementation of new rates post approval can be long. This is more an issue for personal than for commercial lines, which are mostly deregulated. Decision biases which are rooted in insurers' difficulty predicting the true cost of a policy also play into the momentum trend. In long-tail business especially, claims trend factors materialise with a lag. Insurers therefore set rate targets based on a combination of actuarial science and external market signals, including the previous year's price and average market trends. Brokers play an important role in framing the perceptions of the market trends and add to a process of collective adaptive learning. Lastly, insurers look at their current profitability to set rate targets, which also adds a lag.

### How does the last cycle compare to the past?

Loss- and asset-shocks have triggered hard markets in the past.

A review of past cycles identifies that two major types of events triggered the last two broad-based hard markets in non-life insurance: loss shocks and asset shocks. The hard market of 1984/85 was triggered by the US liability crisis, which to date remains the most severe underwriting-loss shock experience for the US industry. The crisis arose due to escalating losses, especially from environmental liability and asbestos-related claims, and high uncertainty about future claims developments. This, coupled with reduced capacity, led to very high price increases and, in hindsight, to over-reserving, followed by a 10-year period of unwinding overshot prices and reserves. The crisis spread through international re/insurance to the London market and was one of the triggers of the Lloyd's crisis of the early 1990s. The hard market of 2001/04 had a double-trigger with the catastrophic World Trade Center (WTC) loss and the 2000–2003 global stock market meltdown after the tech bubble burst, resulting in a more severe loss in capital than in other cycles.

However, large catastrophes are no guarantee for market impact, ...

The effect of catastrophic losses on pricing is less today than in the past. This is because losses from large cat events are quickly replenished by new capital raised in both traditional carriers and via AC vehicles. If capital is plentiful or profitability is strong, the impact of large catastrophes is diminished. For example, the impact of the Northridge earthquake (1994) was offset by strong investment returns and reserves releases, while hurricane Sandy (2012) was offset by high capacity and reserves releases. Unless catastrophes alter market perception of risk over the long term (eg, terrorism, flood risk), their impact is limited and short-lived.

...nor are asset-shocks.

The financial crisis of 2008/09 did not cause insurance rates to harden, despite the subsequent equity market collapse, the decline in value of asset-backed securities, and the complete drying up of external capital and liquidity sources. The significant capital losses did not trigger market hardening because re/insurers pursued cash flow underwriting as external sources of liquidity disappeared. Another lesson from this episode is the dependence of insurers' pricing power on the health of the underlying business/risk pool: commercial insurance premiums did not harden in 2009/10 because collectively, corporations were limited in their ability to pay more.

In the current cycle, benign claims trends freed up capacity and reduced demand for casualty insurance.

A feature of the current cycle was the unusually low claims growth in casualty insurance up to about two or three years ago. Low healthcare and wage inflation in the aftermath of the financial crisis were the economic forces behind the benign liability claims inflation. The low growth in claims weakened demand for casualty insurance, and fuelled reserve releases that have lasted much longer than would be expected in a typical cyclical pattern. At the same time, with demand for casualty insurance declining, there was more capacity to underwrite casualty business.

Also, investment yields are low due to low interest rates.

Also, the current market is characterised by unusually low earnings from investments due to low interest rates. This reduces the incentive to pursue cash-flow underwriting, so traditional re/insurers have been maintaining underwriting discipline much more than in the late 1990s. Additionally, the general low-yield environment has made property cat reinsurance a relatively attractive investment, so AC has risen rapidly. This influx of AC is one of the main factors explaining the only moderate hardening for US cat business following the large 2017 cat losses, and the resultant excess capacity has caused spill-over effects into other lines of business as well.

# Quantifying the current profitability gap

Non-life markets are currently in a pricing transition period, but a significant profitability gap remains.

We believe that non-life insurance markets are in a transition period between a prolonged soft and a hardening market. Commercial lines and reinsurance premium rates started to rise at the end of 2017. Additionally, prices in personal lines have hardened moderately in Australia, Japan, the US and Canada for a few years, but are still trending down in other markets. It remains to be seen how strong and sustainable the firming market is. Insurers need to improve their underwriting performance more if current ROE shortfalls are to be redressed.

Our scenario assumptions:

To illustrate the main findings of this study around the existing profitability gap, we present an accounting scenario for the largest markets in Table 5. The following assumptions are key in terms of shaping our view on the medium-term outlook:

Investment yields have bottomed out but are unlikely to increase drastically.

- Investment yields have bottomed out from the long-lasting decline in interest rates but at the same time, according to our interest rate forecasts they are not set to increase dramatically from hereon. As the basis for the profit gap assessment, we used 2017 actual yields excluding realised and unrealised capital gains, because we wanted to reflect a typical current profit contribution from investment. Differences in investment yields between countries reflect differences in long-term interest rates, the asset mix and accounting principles.

Solvency ratios and asset leverage peaked earlier in the cycle, and are shown at 2017 levels in our scenario.

- Solvency ratios and asset leverage are also shown at 2017 actual levels. Both metrics peaked earlier in the underwriting cycle. Short-term trends are strongly influenced by capital management measures and fluctuations in asset values. Long-term trends are determined by exposure trends.

The tax rates are set at the averages of the last 10 years.

- Tax rates reflect the averages of the last 10 years, excluding years with negative pre-tax income as these do not contribute to assessing the normal tax burden of a year with positive profits. We have not adjusted values for the effects of the US tax reform, because we do not know how the base erosion and anti-abuse tax (BEAT) provisions will play out for the industry.

Target ROEs are set to approximate long-term average returns.

- Target ROEs are set to approximate long-term average returns, adjusted for inflationary effects. They refer to market ROEs including mutuals. On average, stock companies have higher ROEs than mutuals, but to represent a comprehensive market scenario, all players need to be considered.<sup>29</sup> We chose a higher target of 12% for Australia relative to 10% for other mature markets to reflect the more aggressive capital leverage and higher historical return levels there. Similarly, the 15% ROE target for China is based on the capital leverage and higher return expectations for emerging economies.

By how much do premium rates need to rise?

Given actual investment yields, average tax rates and solvency ratios, the target ROE translates into a target underwriting result for each country. The difference to the actual underwriting result quantifies the need to improve premium rates.

<sup>29</sup> See box "Profitability drivers of US non-life insurers" on page 19.

## Quantifying the current profitability gap

**Table 5**  
Estimation of the profitability gap

	2017	2017	2017	2017	2017	2017	2016	2017	2017
In % of net premiums unless marked with +	US	Canada	UK	Germany	France	Italy	Japan	Australia	China
Target ROE +	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	10.0%	12.0%	15.0%
Solvency ratio	116.8%	104.4%	107.3%	115.3%	109.8%	107.5%	126.0%	80.0%	44.9%
Profit margin (after tax)	11.7%	10.4%	10.7%	11.5%	11.0%	10.8%	12.6%	9.6%	6.7%
Corporate tax rate +	20.9%	21.7%	18.3%	18.7%	28.3%	22.5%	35.6%	26.3%	22.4%
Profit margin (pre tax)	14.8%	13.3%	13.1%	14.2%	15.3%	13.9%	19.6%	13.0%	8.7%
Investment yield +	3.0%	2.3%	2.6%	2.6%	2.1%	2.8%	1.7%	3.7%	3.8%
Asset leverage	272.9%	235.5%	274.6%	286.2%	336.4%	296.4%	284.4%	194.8%	166.4%
Net investment result	8.2%	5.5%	7.0%	7.5%	7.1%	8.3%	4.9%	7.3%	6.3%
Other expenses (earnings)	0.6%	0.2%	0.0%	0.0%	-1.3%	-0.3%	-0.3%	0.0%	-0.4%
Target underwriting result	7.2%	8.0%	6.1%	6.7%	6.9%	5.2%	14.4%	5.8%	2.0%
Actual underwriting result	-3.9%	3.7%	0.2%	0.7%	2.1%	-0.7%	5.7%	7.4%	1.3%
Gap	-11.1%	-4.4%	-5.9%	-6.0%	-4.7%	-5.9%	-8.8%	1.6%	-0.8%
Cat surprise	4.4%	-1.3%	-2.9%	-0.9%	-1.8%	1.5%	3.9%	1.1%	-0.4%
Reserves development	1.2%	3.6%	n.a.	-0.5%	n.a.	5.0%	n.a.	4.0%	n.a.
Adjusted u/w result	-0.8%	-1.2%	-2.6%	0.3%	0.4%	-4.1%	9.5%	4.5%	0.8%
Gap, normalised results	-7.9%	-9.2%	-8.7%	-6.4%	-6.5%	-9.4%	-4.9%	-1.2%	-1.2%

+ excluding realized capital gains

Source: Swiss Re Institute

To assess profitability of business, reserves changes and cat losses need to be adjusted for...

Conventional financial accounting data presents two drawbacks with respect to assessing the profitability of non-life business written in 2017.<sup>30</sup> In the bottom rows of Table 5, we correct for these weaknesses as far as sufficient data is available. The drawbacks are:

- Accounting data lag the profitability of currently-written business due to the impact of changes in reserves on the "claims incurred". Strengthening or releasing claims reserves for previous underwriting years is not related to the underwriting conditions of current business, and hence can substantially distort the data. We adjust for the deviation of normal reserving patterns to estimate the impact of reserves cycles on current business. We could not make these adjustments for the UK, France, Japan and China due to lack of data disclosure.
- Catastrophe losses are random and therefore create changes in loss ratios that do not reflect actual changes in pricing or loss trends. This can lead to serious misinterpretation of loss trends. We substitute the actual cat losses for each country by an expected value to correct for the influence of event risk.<sup>31</sup>

...with the effect of widening the estimated profitability gap.

The effect of the two adjustments is to widen the existing profitability gap for all markets except the US and Japan, because of above-average cat losses in both.<sup>32</sup>

<sup>30</sup> 2016 in Japan.

<sup>31</sup> The expected values are determined on market levels based on trend analysis, not modelled cat scenarios.

<sup>32</sup> In Japan, the higher natural catastrophes losses were due to the Kumamoto Earthquake and several typhoons. In the US, above-average losses were caused by the hurricanes Harvey, Irma, Maria and record-high wildfire losses.



To meet target ROEs, underwriting performance must improve by 6 to 9 ppt in the major western markets.

Underperformance is larger on a gross basis, before reinsurance.

A substantial improvement in prices and underwriting is necessary.

Table 5 indicates that non-life insurers in the major North American and European markets must improve their underwriting margin by 6 to 9 ppt, depending on the market, to achieve a reasonable ROE. The gap is smaller for the Asia/Pacific markets of Australia, China and Japan. Underwriting margins need to go up by around 5 ppt in Japan. Australia and China show a profitability gap of just 1 ppt. Australia has already experienced significant rate increases and as such appears to be ahead of the global underwriting cycle.

It is important to note that the actual degree of underpricing is larger on a gross basis than the shown by the net results, because insurers have improved their underwriting results via reinsurance. The pressure to increase premium rates is higher if more ambitious target ROEs are expected by investors. This could particularly be the case in markets where past underwriting results have been extremely volatile like in the UK, or have been stronger as a result of a higher level of capital leverage such as in Australia. The gap for China, the only emerging market in our sample, would also be higher, for example, through an increase in capital leverage to align more with the other markets.

The pricing pressure on insurers has heightened interest in innovation. Reducing expenses and enhancing the claims management process improves underwriting performance. After a decade of low organic growth and weak pricing, insurers have actioned operational efficiencies through innovation, but these measures will not be sufficient to meet earnings targets. What's needed is a substantial improvement in prices and underwriting results.

# Outlook for the economy and non-life insurers

The expected closing of the economic output gap in 2018 signals a changing environment for non-life insurers...

...but not so much so as to close their existing profitability gaps.

General inflation pressures are increasing, particularly in advanced economies.

In our view, inflation risks are higher in the US than in the euro zone.

Wage and healthcare inflation trends are of particular importance to non-life insurers.

A shift in underlying macroeconomic drivers signals a changing environment for non-life insurers. The global economy has taken a long time to recover from the recession that followed the financial crisis of 2007/08. The slow economic growth, benign inflation backdrop, and prolonged low interest rate environment has impacted the profitability of the non-life insurance sector.

Underlying economic growth improved strongly in 2017 and the global output gap is forecast to close some time in 2018.<sup>33</sup> The narrowing gap is putting upward pressure on inflation and interest rates, the latter as central banks in many countries start withdrawing monetary stimulus to ward off overheating. Rising interest rates will support non-life insurers' earnings, but we do not expect long-term interest rates to rise substantially. Furthermore, accelerating inflation is likely to drive up claims costs, thereby creating an offsetting effect for profitability. Therefore, we believe economic developments alone will not be enough to close the existing profitability gap.

## General and claims inflation outlook

After a prolonged period of low inflation (average G7 inflation has exceeded 2% in only two of the last 20 years), price pressures appear to be increasing in most advanced economies. This is especially true in markets where the output gap appears to have already closed, and capacity constraints are likely to put modest upward pressure on prices.<sup>34</sup> In particular, according to the US Congressional Budget Office, the US output gap closed in the third quarter of 2017, and oil price developments so far in 2018 have already pushed headline inflation higher.<sup>35</sup> In our assessment, emerging economies still have some slack and as such, inflationary pressures remain more subdued there. In emerging China, inflation averaged 2% in the first five months of 2018, slightly higher than the annual average of 1.5% in 2017.

While we expect inflation will increase only gradually and be kept in check by tightening monetary policy, we also acknowledge that a sharper-than-expected rise in inflation has developed into a major risk factor. Central banks are very wary of adverse financial market reactions from unexpected rate hikes, and policy inaction could see inflation increase to above-target levels. At this juncture, in our view inflation risk is higher in the US than in the euro area.

More than general inflation trends, wage and healthcare inflation are of particular importance to non-life insurers. Wage inflation is a key driver for bodily injury claims severity as a main component of healthcare expenditures, and also via loss of income of the injured. Separately, wage inflation is also a driver of general repair costs. Although employment growth and wages have picked up recently across the major economies, the pace of wage gains lingers well below pre-crisis levels in most countries. We expect the recent firming trends to continue over the next few years amid above- and then at-trend GDP growth, but for wage inflation to still remain below pre-crisis rates.

<sup>33</sup> A. Kose, "Why the global economy could be turning a significant corner, in six charts", *blogs.worldbank.org*, 19 January 2018, <http://blogs.worldbank.org/developmenttalk/why-global-economy-could-be-turning-significant-corner-six-charts>

<sup>34</sup> Ibid.

<sup>35</sup> According to the Congressional Budget Office, the US output gap closed in the third quarter of 2017.

Healthcare expenditure growth in the advanced markets has been relatively subdued, but we expect modest acceleration in the coming years.

The general development of healthcare expenditures (rising costs of treatment) also impacts bodily injury claims severity. Over the past two decades, growth in healthcare expenditures in a number of advanced markets has exceeded annual nominal GDP growth by roughly 1–2%.<sup>36</sup> Healthcare expenditures have decelerated since the mid-2000s in a number of those countries, and like wage and headline inflation trends, have remained relatively subdued in the post-crisis period. There has been modest acceleration in the past few years, and we expect this to continue over the next year or two, driving up bodily injury claims severity and potentially weakening reserve adequacy in casualty lines.

A moderate reflation of mature economies will likely lift claims severity trends gradually.

Weak labour markets reduced headline and claims inflation over the previous 10 years, and lowered demand for casualty insurance. We think a moderate reflation of mature economies, especially looking to healthcare inflation, will likely lift claims severity trends gradually, weaken reserves adequacy and lift demand for casualty insurance. Insurers are also worried about the potential increase of claims frequency connected with an economy at full employment.

Liability claims may additionally trend up amidst a judicial and legislative environment that is moving toward rising consumer protection.

The changing legal environment toward rising consumer protection may be another factor contributing to rising claims from product liability and securities actions citing deceptive conduct, breach of duty and negligence. For instance in Australia, securities class actions taken by shareholders and the size of resulting settlements have increased significantly in the last five years. This has been one of the key factors underpinning rate hardening in financial and professional liability. Rising consumer protectionism (in terms of plaintiff-friendly class action regimes), increasing law firm involvement and active third-party litigation funding have all contributed to this dynamic. Anecdotally, increasing litigation cost inflation is also evident in the US, with more large verdicts delivered in commercial motor accident cases, driving up claims severity.

Reserving may soon prove insufficient in key markets like the US.

Reserving may soon prove insufficient in key markets like the US. Reserves from the hard-market years are waning and the reserve adequacy of more recent loss years is unclear.<sup>37</sup> This is because (1) key liability lines' reserves look deficient and weaker than in 2016, while downward pressure on liability rates continued through to the end of 2017; (2) commercial auto still appears deficient despite significant rate increases during 2016 and 2017; (3) there were significant reserve releases in 2017 which, in combination with still-falling premium rates, likely weakened overall reserves adequacy; and (4) benign loss trends have prevented significant loss ratio deterioration. However, as discussed above, we expect those benign trends to reverse and trend higher over the next few years. All in, we expect reserve releases will eventually morph into a need to strengthen reserves, but it is difficult to project when that will happen.

<sup>36</sup> Data for 1998-2017, for Canada, Germany, France, Japan and the US, based on national statistical sources.

<sup>37</sup> *IBNR weekly*, Dowling & Partners, 15 March 2018.

### Premium rate outlook

We expect just moderate pricing improvement in commercial lines in 2018, ...

For commercial lines broadly, we expect just moderate improvement in pricing in 2018, with variations across markets and segments. There has been a sharp acceleration in claims in the motor market in recent years, particularly in the US. In response, US personal and commercial auto pricing has been increasing since 2015, with no signs of moderation.<sup>38</sup> Profitability should be improving, but there is still a long way to go to catch up with the surge in claims trends.

...with variations across markets and segments.

In Australia, the firming of premium rates across profit-challenged lines of business is now more widely accepted. For some lines, for instance D&O, we expect a sharp increase in premium rates as capacity has become tight due to rising litigation. And in motor, more expensive imported parts and advanced driver assistance systems are driving up repair costs. In China, however, premium rates in the heavily motor-dominated market remain under pressure following rate liberalisation in the segment in July 2016.<sup>39</sup> In Japan too, motor premium rates look set to weaken. After cutting compulsory motor premium rates in April 2017, major players announced rate cuts in January 2018 after the General Insurance Rating Organisation (GIRO) set lower guiding rates for voluntary auto cover to reflect lower claims due to widespread use of advanced sensors in vehicles.<sup>40</sup>

### Interest rate and investment outlook

Interest rates have been low for a prolonged period.

Before the global financial crisis, the nominal interest rate on the 10-year US government bond averaged around 4.5%, and the real interest rate, defined as the nominal interest rate minus inflation expectations, around 2%. Whereas inflation expectations were relatively stable (with the exception of a sharp temporary drop in 2008), the real interest rate dropped sharply during the global recession, reaching a trough of -0.8% in 2012. Since then, the real interest rate has rebounded to about 0.8%, still below pre-crisis levels.

Our baseline projections assume relatively low interest rates for the next few years, though slightly above today's levels.

There has been a similar pattern in other G7 markets. In nominal terms, interest rates have been low for a prolonged period, driven by highly accommodative monetary policy, an excess of savings due to demographic developments and the integration of China and India into the world economy, and possibly also the lower capital (investment) needs of new technologies. Our baseline view assumes that secular forces such as low productivity growth, ageing societies and a global shortage of safe assets will keep real rates relatively low, though slightly above today's levels.

We believe the trend of declining investment yields has bottomed out.

More specifically for insurers' investment income, we believe the trend of declining investment yields has bottomed out. With US interest rates rising since mid-2016, replacement yields for investments have improved. We expect interest rates in Europe to rise moderately, and for real yields to return to positive territory in 2020. The expected further raising of the US policy rate will cause a flattening of the yield curve and benefit the yield on the short-term spectrum of investments. Longer maturity bond portfolios roll over more gradually since insurers mostly hold their bonds to maturity. Average yields will therefore follow rising market yields with a lag, since only new cash flows will be invested at the gradually rising yields.

<sup>38</sup> Price increases averaged around 7% in 2017 for personal auto, based on the particular sub-component of the Consumer Price Index (CPI), and around 6% for commercial auto (based on the Council of Insurance Agents & Brokers (CIAB) survey).

<sup>39</sup> China Insurance Regulatory Commission, *Commercial Vehicles Reform Press Conference*, June 2017, <http://circ.gov.cn/web/site0/tab7926/info4076940.htm> (Chinese only).

<sup>40</sup> *Announcement on the revision of the Reference Loss Cost Rates for voluntary automobile*, General Insurance Rating Organisation of Japan, 9 June 2017, [https://www.giroj.or.jp/english/press\\_2017/20170609.pdf](https://www.giroj.or.jp/english/press_2017/20170609.pdf)

Insurers would benefit from rising interest rates.

Any sustained rise in interest rates will be beneficial for proprietary asset managers, including non-life insurers, as fixed income investments make up about 70-80% of portfolio investments in a number of G7 markets. Rising rates would lead to higher investment yields and higher profit contributions from asset management. However, rising interest rates can lead to mark-to-market accounting losses on insurers' bond portfolios which may reduce insurers' net worth depending on the accounting regime.

In personal lines, digital distribution is disintermediating traditional agents.

## Are investments in technology affecting profitability?

Technology affects distribution in personal and commercial lines in fundamentally different ways. Technology investment in personal lines focuses on disintermediation. US personal lines carriers have increased their use of direct distribution channels to 16% of sales (up 9.2 ppt) over the last 20 years.<sup>41</sup> Technology in distribution is about more than online sales. It also spans hybrid distribution models. Globally, about 32% of P&C personal lines insurance sales advice and quotes are provided via digital channels.<sup>42</sup> Beyond the market impact of fully-fledged digital distribution, online aggregators have increased price transparency, making motor insurance in particular a commodity. Independent agencies are losing part of their value proposition, and commission and expense rates in personal lines are slipping.

Top brokers are investing in digital analytics to capture a larger share of the commercial insurance value chain.

This trend also extends to small-commercial insurers, but to a lesser extent. Small businesses are most likely to buy workers compensation and liability insurance via direct channels. The bulk of technology investments in commercial insurance instead comes from top brokers and focuses on monetising data via client segmentation, underwriting analysis and commoditisation of business. Insurance carriers lose bargaining power and brokers promote portfolio underwriting using their tech-enabled facilities. Rising commercial commission rates are a reflection of top brokers' larger share of the insurance value chain captured via additional compensation from carriers.

Technology reduces claims costs in certain lines.

Technology such as telematics has reduced claims frequency and severity in some markets. In Italy, for example, telematics devices have reduced the risk of fraud and allowed better determination of damages. Currently about 20% of Italian motor policies are sold on this basis.<sup>43</sup> We expect the use of telematics in all of Europe to accelerate in the coming years. There are many other areas where technology, especially advanced data analytics, are deployed by insurers to simplify the claims process and reduce fraud. Lower claims costs can improve profitability initially and be a source of competitive advantage, but in competitive markets often they will eventually be (partially) passed on to consumers.

<sup>41</sup> *Ten key findings of the 2016 Agency Universe Study*, IABSC, 2017.

<sup>42</sup> *Reimagining insurance distribution*, Accenture, 2016.

<sup>43</sup> *The Italian Insurance Market: 2016 figures + 3M17 overview*, Price Waterhouse Coopers, 2018.

There are signs of market strengthening, but non-life insurers need to further improve their underwriting performance.

Macroeconomic developments alone will not be enough to fuel sustained improvement in profitability...

...while the efficiency gains from technology investments partially dissipate due to costs and pass-through to consumers.

### Redressing for future profitability

Though the underwriting cycle seems to have reached an inflection point and non-life insurance prices are hardening modestly in the major markets, our analysis shows more work needs to be done if insurers are to close the existing profitability gap. To deliver target returns to investors, our analysis shows that underwriting margins need to improve by at least 6 to 9 points in the major western markets, and by around 5 points in Japan.

The evolution of the global economy into a later stage of the business cycle will benefit future profitability through (moderately) higher interest rates and investment returns in mature markets, but tighter labour markets are also expected to push up general and claims inflation at the same time. More rate increases in excess of claims trends will be needed to achieve a sustainable improvement in profitability.

Insurers' investments in technology have generated efficiency gains and compressed margins for the distribution system in commoditised lines. There are also benefits in reducing claims costs. But initially, the benefits to insurers' profitability are clouded by the cost of investment in technology, and often they are partially passed on to consumers due to competition. In the long run, investments in data and advanced analytics do serve to improve underwriting, and also the insurability of increasingly complex commercial risks. Technology improves insurability through improved affordability, access and/or better ability to underwrite new and hard-to-quantify risks.

## Harmonising different insurance accounting systems

The insurance accounting systems of the different markets have developed over many decades, including with varying use and interpretation of terminology. To make cross-country data more comparable, adjustments are required for a number of markets. Our analysis follows the US statutory accounting principles which is derived from US GAAP with a focus on solvency regulation.<sup>44</sup> All items are net of reinsurance.

## Sources for insurance market data

### Australia

Source: Australian Prudential Regulation Authority (APRA).

Note: General expenses and other incomes/expenses are allocated to underwriting expenses. Unrealised capital gains/losses on investments are excluded.

### Canada

Source: MSA Research, Insurance Bureau of Canada (IBC) and Canadian Statistics.

Note: Excludes government auto insurers due to unavailability of data in recent years.

### China

Source: AM Best and companies' annual reports.

Note: Our market aggregate is based on a sample of 51 insurance companies; Anbang P&C was not included for 2017 due to delayed disclosure after the government's bailout.

### France

Source: Fédération Française de l'Assurance, «Les comptes de l'assurance dans l'année ...» of different years.

Note: Market aggregate is adjusted by excluding insurers with insignificant insurance activities which serve mainly as holding companies. Capital funds includes equalisation reserves and tax-adjusted excess values of investments.

### Germany

Source: Bundesaufsichtsamt für das Finanzwesen (BaFin), Erstversicherungsstatistik, Gesamtverband der Deutschen Versicherungswirtschaft, Jahresabschlussstatistik.

Note: Market aggregate is adjusted by excluding insurers with insignificant insurance activities which serve mainly as holding companies; balance sheets are adjusted. General expenses and other incomes/expenses are allocated to underwriting expenses. Underwriting and overall results are before change in equalisation reserves. Capital funds includes equalisation reserves and tax-adjusted excess values of investments.

### Italy

Source: Associazione Nazionale fra le Imprese Assicuratrici (ANIA) "L'assicurazione Italiana in ..." of different years, Infobila (insurance database by ANIA).

Note: General expenses and other incomes/expenses are allocated to underwriting expenses. Capital funds includes equalisation reserves and tax-adjusted excess values of investments.

<sup>44</sup> [http://www.naic.org/cipr\\_topics/topic\\_statutory\\_accounting\\_principles.htm](http://www.naic.org/cipr_topics/topic_statutory_accounting_principles.htm)

### **Japan**

Source: Hoken Kenkyujo (Insurance Research Institute) "The Statistics of Japanese non-life Insurance Business" of different years.

Note: The data was adjusted by removing maturity refund products which contain a large savings component in premiums and claims payouts.

### **UK**

Source: AM Best, Association of British Insurers.

Note: Our market aggregate is based on a sample of 35 insurance companies.

### **US**

Source: A.M. Best and SNL.

Note: National Indemnity was excluded from the market data due to its large share of capital allocated to non-insurance businesses. Capital funds are named policyholder surplus in statutory accounting.



## Glossary

**Asset leverage** = average invested assets as a % of net premiums earned (NPE)

**Combined ratio** = sum of loss ratio, expense ratio and policyholder dividend ratio

**Expense ratio** = commissions and underwriting expenses in % of net premiums written (NPW)

**Total investment yield** = net investment income and realised capital gains as a % of average invested assets at market values

**Loss ratio** = losses incurred in % of NPE

**Operating ratio** = Operating result as a % of NPE

**Operating result** = underwriting result plus allocated interest income

**Policyholder dividend ratio** = policyholder dividends as a % of NPE

**Profit margin (after tax)** = net profit after tax as a % of NPE

**Profit margin (pre-tax)** = net profit before tax as a % of NPE

**Loss reserve ratio** = loss reserves as % of net premiums

**ROE** = net income after tax in % of average capital funds

**Solvency ratio** = average capital funds in % of NPE

**Tax rate** = corporate taxes on profits in % of pre-tax profit

**Underwriting result** = premiums minus commissions minus underwriting expenses minus losses incurred

# Recent *sigma* publications

- 2018**
- No 1 Natural catastrophes and man-made disasters in 2017: a year of record-breaking losses
  - No 2 Constructing the future: recent developments in engineering insurance
  - No 3 World insurance in 2017: solid, but mature life markets weigh on growth
  - No 4 Profitability in non-life insurance: mind the gap
- 2017**
- No 1 Cyber: getting to grips with a complex risk
  - No 2 Natural catastrophes and man-made disasters in 2016: a year of widespread damages
  - No 3 World insurance in 2016: the China growth engine steams ahead
  - No 4 Insurance: adding value to development in emerging markets
  - No 5 Commercial insurance: expanding the scope of insurability
  - No 6 Life in-force management: improving consumer value and long-term profitability
- 2016**
- No 1 Natural catastrophes and man-made disasters in 2015: Asia suffers substantial losses
  - No 2 Insuring the frontier markets
  - No 3 World insurance 2015: steady growth amid regional disparities
  - No 4 Mutual insurance in the 21st century: back to the future?
  - No 5 Strategic reinsurance and insurance: the increasing trend of customised solutions
- 2015**
- No 1 Keeping healthy in emerging markets: insurance can help
  - No 2 Natural catastrophes and man-made disasters in 2014: convective and winter storms generate most losses
  - No 3 M&A in insurance: start of a new wave?
  - No 4 World insurance in 2014: back to life
  - No 5 Underinsurance of property risks: closing the gap
  - No 6 Life insurance in the digital age: fundamental transformation ahead
- 2014**
- No 1 Natural catastrophes and man-made disasters in 2013: large losses from floods and hail; Haiyan hits the Philippines
  - No 2 Digital distribution in insurance: a quiet revolution
  - No 3 World insurance in 2013: steering towards recovery
  - No 4 Liability claims trends: emerging risks and rebounding economic drivers
  - No 5 How will we care? Finding sustainable long-term care solutions for an ageing world
- 2013**
- No 1 Partnering for food security in emerging markets
  - No 2 Natural catastrophes and man-made disasters in 2012: A year of extreme weather events in the US
  - No 3 World insurance 2012: Progressing on the long and winding road to recovery
  - No 4 Navigating recent developments in marine and airline insurance
  - No 5 Urbanisation in emerging markets: boon and bane for insurers
  - No 6 Life insurance: focusing on the consumer
- 2012**
- No 1 Understanding profitability in life insurance
  - No 2 Natural catastrophes and man-made disasters in 2011: historic losses surface from record earthquakes and floods
  - No 3 World insurance in 2011: non-life ready for take-off
  - No 4 Facing the interest rate challenge
  - No 5 Insuring ever-evolving commercial risks
  - No 6 Insurance accounting reform: a glass half empty or half full?
- 2011**
- No 1 Natural catastrophes and man-made disasters in 2010: a year of devastating and costly events
  - No 2 World insurance in 2010: premiums back to growth – capital increases
  - No 3 State involvement in insurance markets
  - No 4 Product innovation in non-life insurance markets: where little “i” meets big “I”
  - No 5 Insurance in emerging markets: growth drivers and profitability

**Published by:**

Swiss Re Management Ltd  
Swiss Re Institute  
P.O. Box  
8022 Zurich  
Switzerland

Telephone +41 43 285 2551  
E-mail institute@swissre.com

Swiss Re Institute has a global presence with offices in New York, London, Bangalore, Beijing, Hong Kong and Singapore

Authors  
Dr Thomas Holzheu  
Roman Lechner  
Kulli Tamm  
Irina Fan

*sigma* editor  
Paul Ronke

Managing editors  
Dr Jérôme Jean Haegeli  
Swiss Re Group Chief Economist

Dan Ryan  
Head Insurance Risk Research

Explore and visualise *sigma* data on natural catastrophes and the world insurance markets at [www.sigma-explorer.com](http://www.sigma-explorer.com)

© 2018 Swiss Re. All rights reserved.

The editorial deadline for this study was 9 July 2018.

*sigma* is available in English (original language), German, French, Spanish, Chinese and Japanese.

*sigma* is available on Swiss Re Institute's website:  
[institute.swissre.com/sigma](http://institute.swissre.com/sigma)

The internet version may contain slightly updated information.

Translations:

German: Diction AG  
French: ithaxa Communications SARL  
Spanish: Traductores Asociados Valencia S.L.

Graphic design and production:  
Corporate Real Estate & Logistics/Media Production, Zurich



Printing: Multicolor Print AG, Baar

© 2018  
Swiss Re  
All rights reserved.

The entire content of this *sigma* edition is subject to copyright with all rights reserved. The information may be used for private or internal purposes, provided that any copyright or other proprietary notices are not removed. Electronic reuse of the data published in *sigma* is prohibited.

Reproduction in whole or in part or use for any public purpose is permitted only with the prior written approval of Swiss Re Economic Research & Consulting and if the source reference "Swiss Re, *sigma* No 4/2018" is indicated. Courtesy copies are appreciated.

Although all the information used in this study was taken from reliable sources, Swiss Re does not accept any responsibility for the accuracy or comprehensiveness of the information given or forward looking statements made. The information provided and forward-looking statements made are for informational purposes only and in no way constitute or should be taken to reflect Swiss Re's position, in particular in relation to any ongoing or future dispute. In no event shall Swiss Re be liable for any loss or damage arising in connection with the use of this information and readers are cautioned not to place undue reliance on forward-looking statements. Swiss Re undertakes no obligation to publicly revise or update any forward-looking statements, whether as a result of new information, future events or otherwise.

Order no: 270\_0418\_EN

Swiss Re Management Ltd.  
Swiss Re Institute  
Mythenquai 50/60  
P.O. Box  
8022 Zurich  
Switzerland

Telephone + 41 43 285 2551  
Fax +41 43 282 0075  
[institute@swissre.com](mailto:institute@swissre.com)  
[institute.swissre.com](http://institute.swissre.com)