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The General Insurance Industry and the Actuarial Profession in 2020

Prepared by Tony Beirne, Garth Brooker, Mudit
Gupta, Suruchi J Singh and Sylvia Wong

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Institute of Actuaries of Australia
ABN 69 000 423 656
Level 7, 4 Martin Place, Sydney NSW Australia 2000

Abstract

Business today evolves constantly to new socio-economic and political developments. The timing and impacts of these shocks are unpredictable, frequently involving "unknown unknowns." A recent study by PwC has predicted that five mega-trends will further change the playing field for the general insurance industry globally over the next decade. These trends present both challenges and opportunities to all functions of a general insurer.

Our paper is by no means an in depth study of the mega-trends and their impacts, nor does it provide definitive solutions or strategies for insurers and actuaries. Rather, this paper is intended to be a thought starter which:

- consolidates information gathered on all of the projected mega-trends;
- provides some speculation on their impacts on the general insurance industry globally; and
- suggests responses that insurers and actuaries can consider.

We hope that our paper will help increase awareness of the mega trends by providing a framework in which to consider them, thus broadening the scope and thinking for Insurers and Actuaries.

Keywords: 2020, mega-trends, future, social, economic, technology, environment, political, actuarial profession, risk, strategy, big data, governance, STEEP.

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1 Introduction

The general insurance industry has undergone a number of major changes over the past decade, including the consolidation of players in the market; increased competition from offshore insurers; the survival through losses from major catastrophe events and the global financial crisis; as well as compliance with ever increasing regulatory and reporting requirements.

A recent study by PwC has predicted that five mega-trends will further change the playing field for the general insurance industry globally over the next decade. These trends will present both challenges and opportunities to all functions of a general insurer. How will the work of the actuary be affected and more importantly, how can actuaries help general insurers ride the wave of change successfully?

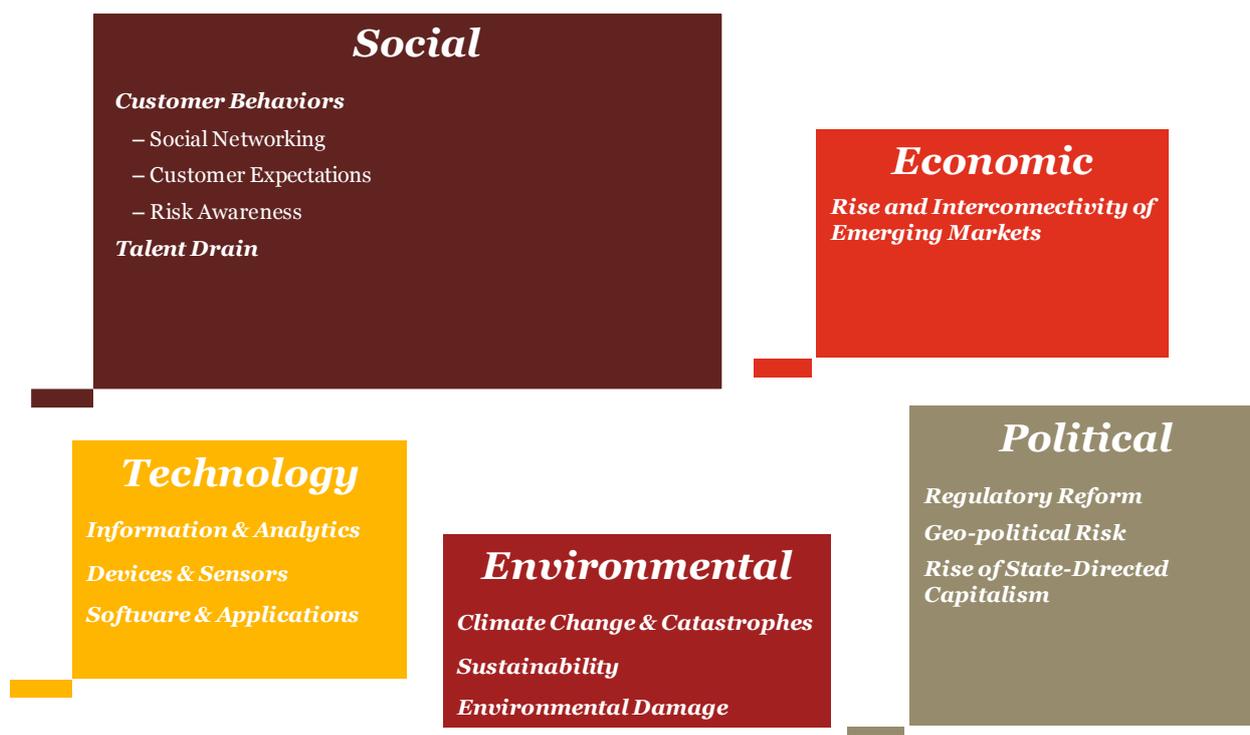
Actuaries in general insurance have been on a constant journey of evolution. From providing advice on a voluntary basis, to the fulfilling of statutory roles in general insurance, actuaries have come a fair way. But what does the future hold? There is a view that general insurance actuaries as a group is mostly valued for its technical skills and role in assisting insurers with compliance, rather than providing commercial advice that can shape an insurer's strategy and future. With the number of actuarial roles available in the general insurance industry predicted to reach saturation point in the short to medium term, how can general insurance actuaries continue to flourish as a group?

Forty years ago, actuaries ventured into the world of general insurance and made themselves relevant. Actuaries must continue to do this by being open to new ideas and constantly evolving. The first step to any response is awareness and it is with this in mind that we present the five mega-trends and their impacts.

2 The Mega Trends

Five mega trends have been predicted to impact on the general insurance industry globally over the next decade. The factors we have discussed in this paper corresponding to these trends are as follows.

Figure 1: 'STEEP' Drivers



The 'STEEP' drivers are as follows:

1. **Social:** Demographic and behavioural changes will result in changes in risk profiles, target markets and the level of competition for general insurers, with the balance of power shifting towards consumers.
2. **Technological:** Advances in software and hardware transform 'big data' into actionable insights.
3. **Environmental:** The increasing frequency and severity of catastrophic events will impact on insurer profits but insurers also have opportunities to contribute towards environmental sustainability solutions and resource management.
4. **Economic:** The rise and interconnectivity of the emerging markets will impact the insurance industry.
5. **Political:** Insurers will have to adapt to global instability and the rise of state-directed capitalism.

We will explore these five mega trends in turn and discuss their impact on the general insurance industry as well as the work of actuaries. It should be noted that some of our discussions may be generalised to focus on the trends observed/projected globally but there will be variations to these trends at a regional/country level. In addition, these

trends do not necessarily act in isolation, rather they may interact with each other resulting in complex outcomes.

3 Social Trends

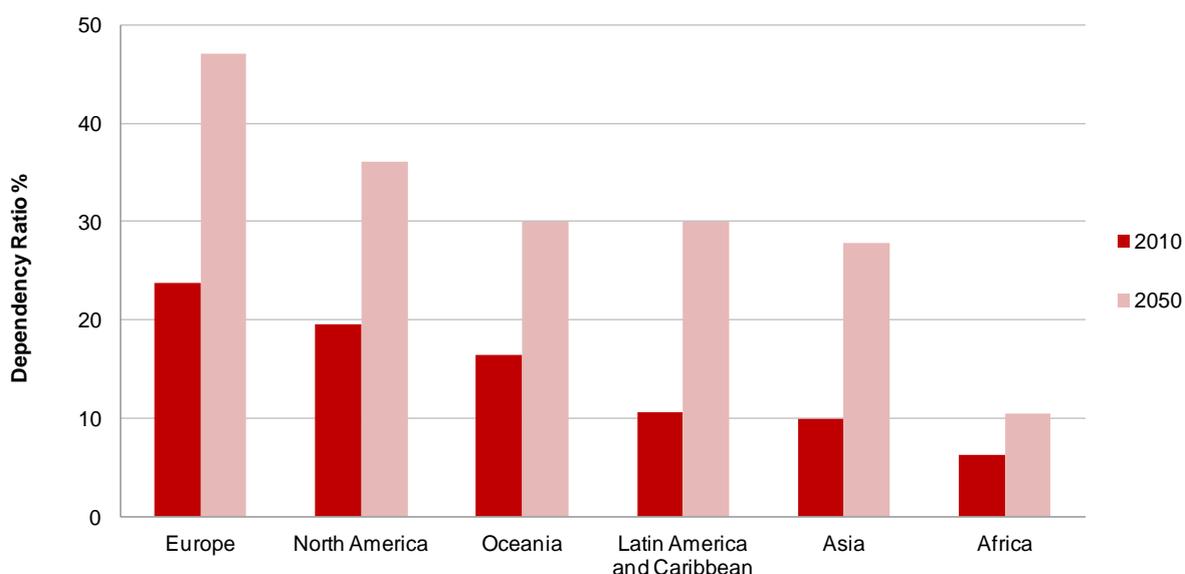
There are a number of phenomena operating under the social banner that are expected to impact the general insurance industry. These include demographic changes and behavioural changes.

3.1 Demographic changes

- The global population has been growing and recently passed 7 billion. This was largely due to decreases in the mortality rate (e.g. as a result of advances in technology) and also due to mortality rates being lower than fertility rates in developing countries.
- However, the growth in the world's population is expected to slow, although the population is still projected to grow in developing countries. Globally, mortality rates have been projected to increase due to diseases and injuries. Fertility rates have been projected to decrease (due to shifting lifestyles).
- The world's population is ageing and the trend is projected to be strongest in developing countries.

A slowdown in population growth and an ageing population means an increase in the dependency ratio (retired/working population). The following graph shows the dependency ratio in 2010 and that projected for 2050 by region.

Figure 2: Dependency Ratio



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Dependency ratios are predicted to double in developed countries and more than double in Asia and Latin America. Note however, that trends do differ between countries within the regions.

Over the past 40 years, Western financial institutions, including general insurers have enjoyed growth as a result of rising populations. The increase in the dependency ratio (retired/working population) means that natural population growth will no longer be able to support GDP growth in some economies. An insurer's decision to enter a different market for growth would affect the actuary's work in all aspects, from risk assessment and premium rating, to regulatory compliance and capital calculations.

3.2 Behavioural changes

- i. The middle class segment of the global population is expected to grow and there is an increasing trend in urbanisation (people moving into cities).
- ii. There will be greater competition for talent in Western economies.
- iii. There will be greater use of digital communication and social media.

i. Rise of the Middle Class and Urbanisation

The following graphs depict the projected growth in the global middle class population and the extent of urbanisation.

Figure 3: Growth of Middle Class

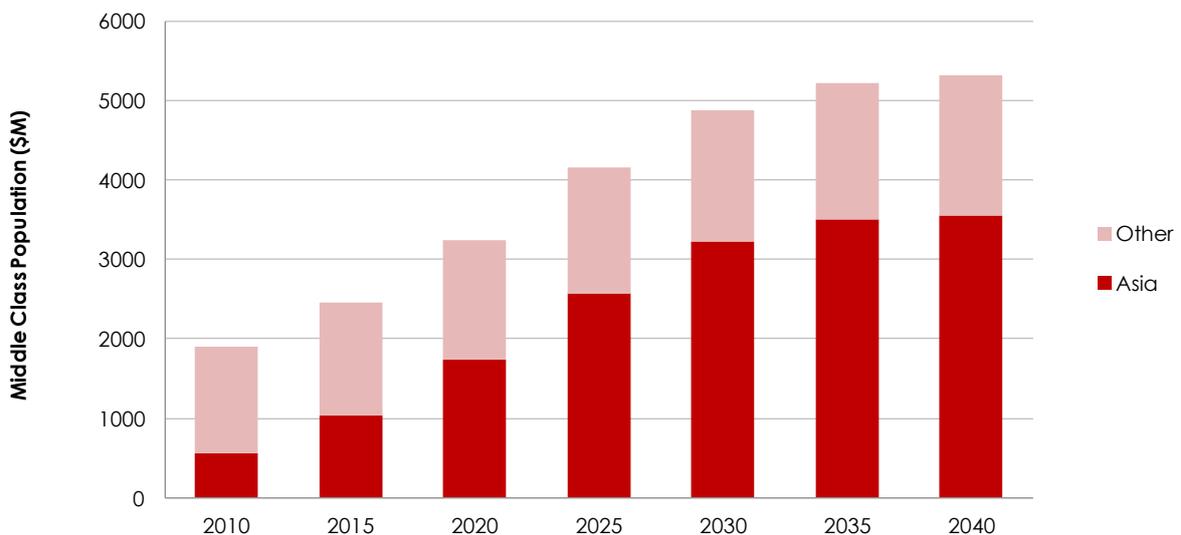
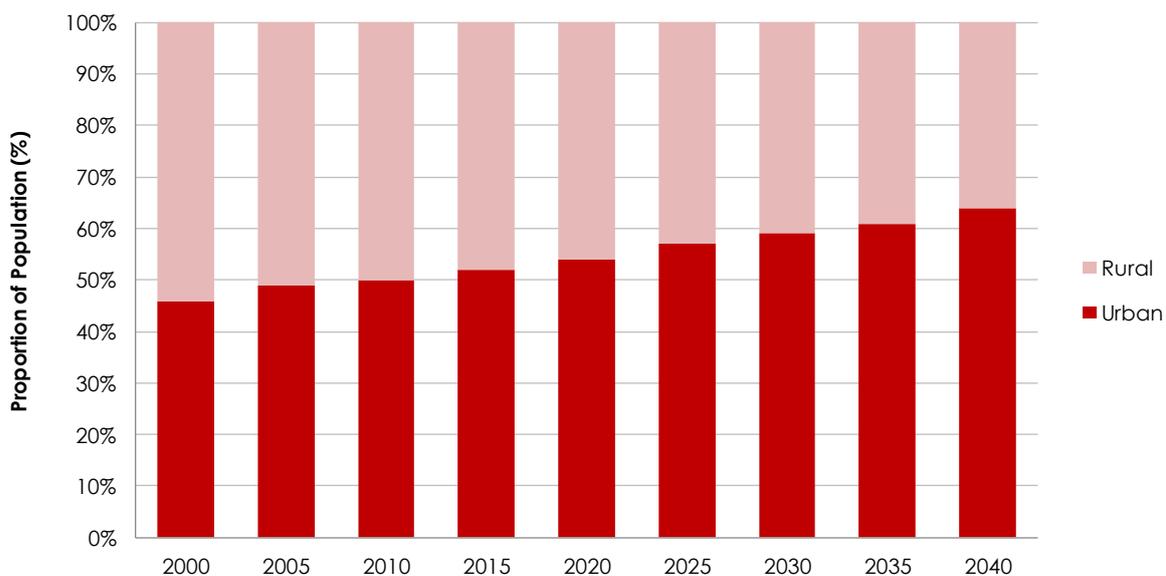


Figure 4: Extent of Urbanisation



Growth in the middle class will be particularly fast in China and India. The interaction of this and population growth in these countries has a significant impact. As segments of the population become wealthier, there will be:

- a general increase in the demand for insurance products;
- a change in the demand for certain products, as luxury items become more affordable; and
- sum insureds can be expected to increase.

An increase in global urbanisation is expected to:

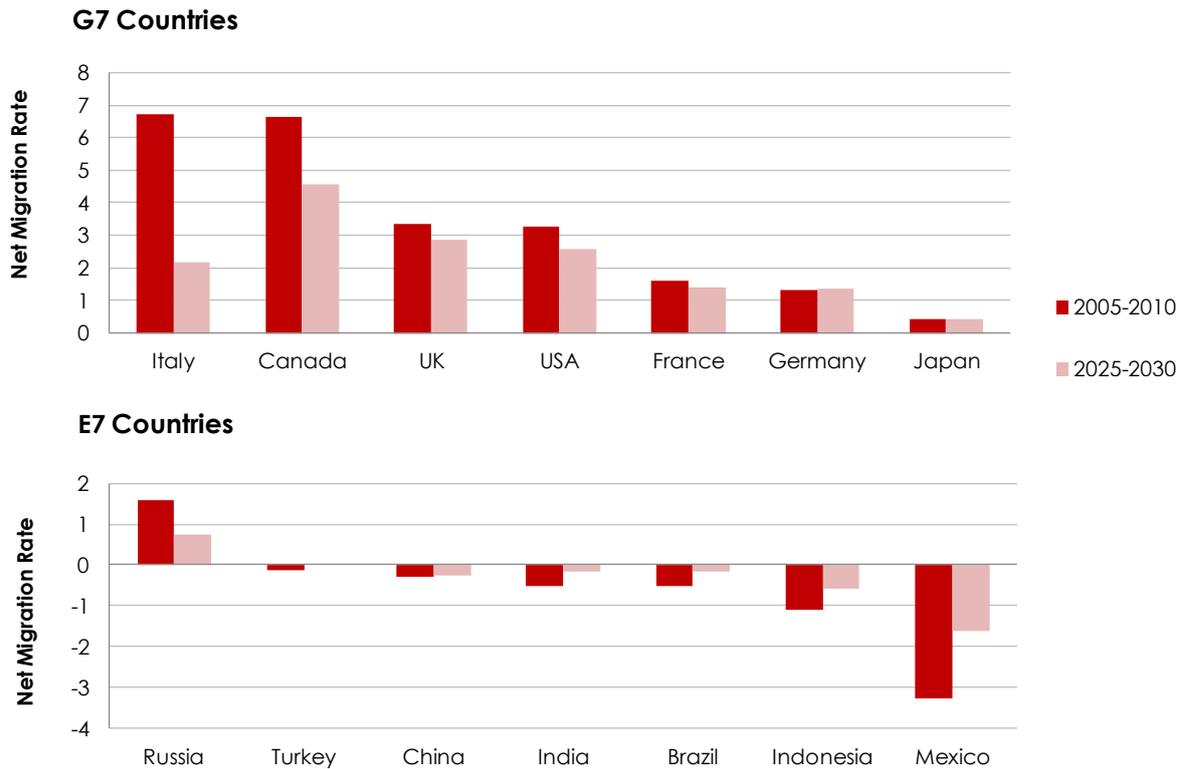
- increase the demand for insurance products in cities rather than in country areas;
- change the dynamics for an insurer's targeted growth markets and the level of competition in these markets; and
- increase the concentration of risk in urban areas and hence higher potential losses for insurers.

Actuaries involved in pricing, reinsurance placements and determining capital would need to take this into consideration.

ii. Competition for Talent

The mobility of labour has also been increasing from emerging markets to Western economies but is expected to slow over the next 20 years. This is depicted in the following graphs.

Figure 5: Net Migration Rate



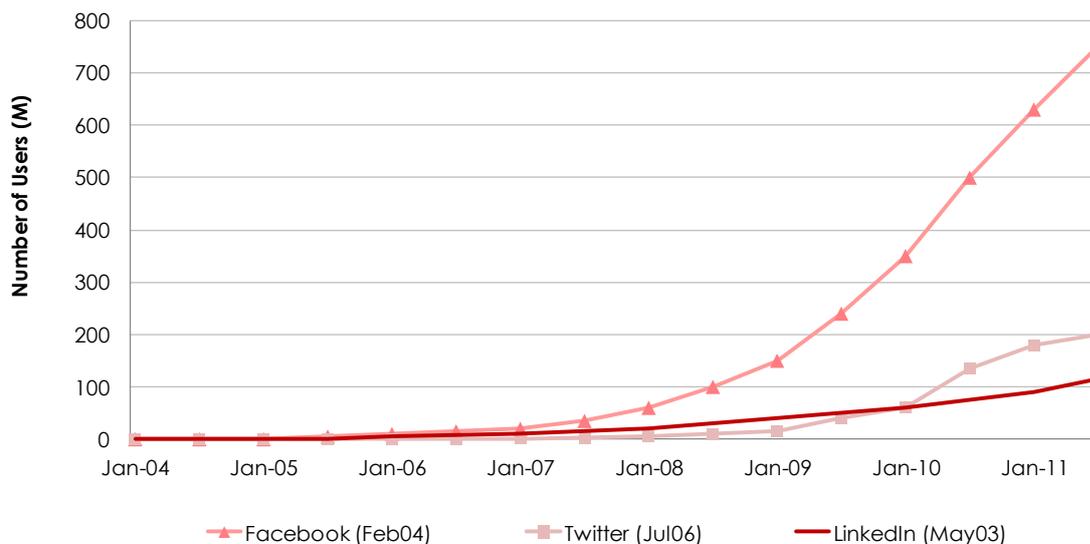
In the face of increasing competition between Western economies for talent, insurers will need to understand and forecast talent requirement, source talent globally and retain talent. In particular, the ageing of experienced underwriters globally has been identified as a major source of concern for commercial insurers. Insurers can respond to this by finding ways to better align scarce underwriter talent to deal only with more complex risks, while intelligent business rule driven models deal with underwriting the less complex risks.

There will also be competition for actuarial talent. Insurers in developed countries aiming to increase profits by cost cutting may outsource actuarial work to cheaper offshore (emerging) markets. However, they will still prefer sign-off by local experienced actuaries who will take responsibility for the work. Insurers (with the help of actuaries) will need to identify tasks that are suitable for outsourcing (such as tasks that are strictly technical, requiring little judgement or local knowledge). The local actuary will also need to consider how he/she will get comfortable with the quality of the work being outsourced. Over the longer term, if most of the technical analysis is outsourced, we may find a situation where young, less experienced local actuaries in developed markets will have difficulty finding technical work to build up their experience on. Competition for actuaries who have experience will increase.

iii. Digital Communication and Social Media

Another trend that is expected to have a significant impact on the general insurance industry is the explosion in the use of digital communication and social media. The following graph shows the growth in the use of major social media sites over time and when these sites commenced operations.

Figure 6: Social Media Users



Changes in social media usage will impact on an insurer's functions in multiple ways.

3.3 Impacts of social media usage

i. Product design and coverage

The use of the internet and social media has resulted in new exposures to 'cyber' risks. Insurers have already launched products or extended coverage on existing products that cover these kinds of risks for businesses. There is a market for protecting individuals from events like loss of data stored on social networking sites, and financial losses due to identity theft. Insurers need to be more innovative with their product design to provide cover for these emerging risks. Actuaries involved with pricing and reserving need to be familiar with new product coverages and understand the events that will give rise to claims.

An interesting example of product innovation is virtual property insurance. Second Life is an example of an online virtual world that allows users (residents) to socialise, create and trade virtual property. In July 2011, a Chinese insurance company 'Sunshine Insurance Group' teamed up with a video game developer and was the first to offer

'virtual property' insurance to online game players. We are not suggesting that insurers should all flock to this market, but the use of social media does open up new opportunities and insurers may want to keep an open mind with product innovation.

ii. Marketing, Sales and Distribution

There has been a progressive move away from the use of agent/broker intermediaries to more direct channels of distribution, especially for personal lines and we expect this to continue. Drivers of this trend include:

- Insurers' increasing spend on social media as a new method of marketing. For example, Unitrin Direct is a US insurer and the first motor insurer to build in Second Life. In their virtual office, a player can visit and obtain a real world insurance quote.
- The rise of aggregator websites - especially in the UK and US, which has made it much easier for consumers to compare prices. This has increased competition in pricing relative to other distinguishing product/service attributes. There is an opportunity for insurers to respond by introducing healthier pricing and differentiation through usage based insurance.
- The increasing use of online user reviews, with over 30% of consumers in developed countries using online postings in making buying decisions.
- The increasing use of group buying. Currently, group buying is not prevalent in insurance but this is expected to grow. iMingle is the first insurer to offer group buying discounts for motor insurance, where consumers within their social network are able to obtain a discount by linking their policies together. We expect this form of self pooling of risks to be the way of the future. As actuaries, we will need to understand how changes in the distribution channel may change the profile of the risks accepted and the impact this will have on claims cost.

iii. Underwriting, Risk Assessment and Pricing

Impacts on underwriting and pricing are as follows:

- Innovation in product design will introduce difficulties in risk assessments due to the lack of data and experience for analysis.
- The impact of using social media as a distribution channel may result in some kind of selection effect depending on the types of websites the insurer chooses to advertise on. (Perhaps the insurer choosing to market its motor policies in the virtual world is hoping that its customers will spend more time in the virtual world than driving in the real world.)
- The use of group buying means that risk assessments need to be conducted at the social network level rather than at the individual level.
- Group buying may also introduce a concentration of risk for the insurer if members of the social network participate in a risky activity together. Actuaries need to allow for the impact of this in estimating claims cost.
- Social media can also be used directly in the underwriting process via the construction of social media scores. Further details can be found in the technology section of this paper.

- The reliance of user reviews and recommendations from social networks in the buying decisions of consumers may lead to an erosion in the price elasticity of insurance premiums. Actuaries need to allow for these effects in pricing for risks.

4 Technological Trends

Advances in technology expected to impact on the general insurance industry are as follows:

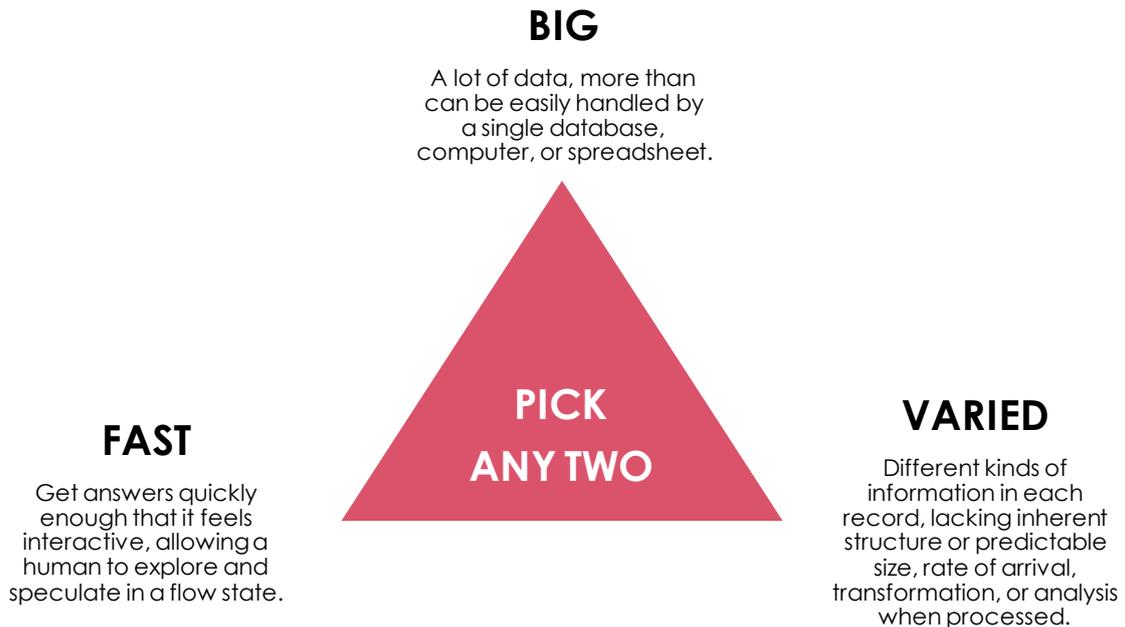
- increased ability to store and process large volumes of data;
- less reliance placed on structured, internal data sources and more on real time, unstructured multimedia data from external sources, such as social media; and
- new analytical techniques for more forward looking insights and automated decision making.

These trends will help drive the general insurance industry from being largely tactical, operational and reactive to being more strategic, proactive and personalised. Insurers who are able to harness these new technologies and techniques will establish a significant competitive advantage in the marketplace. In a recent survey, 49% of more than 150 C-suite executives polled expect new sources and techniques in the use of data analytics to be the key competitive differentiator.

4.1 The 'Big Data' concept

Heralded as the next wave of analytics, 'Big Data' refers to the ability to capture, store and process large volumes of varying data types very quickly – something that has previously been cost prohibitive. It is opening up the possibilities of real time (or close to real time) analysis using of vast amounts of structured data (e.g. that stored in relational databases) and unstructured data (such as text fields and multimedia files) sources. This has the potential to affect literally all aspects of an insurer's operations.

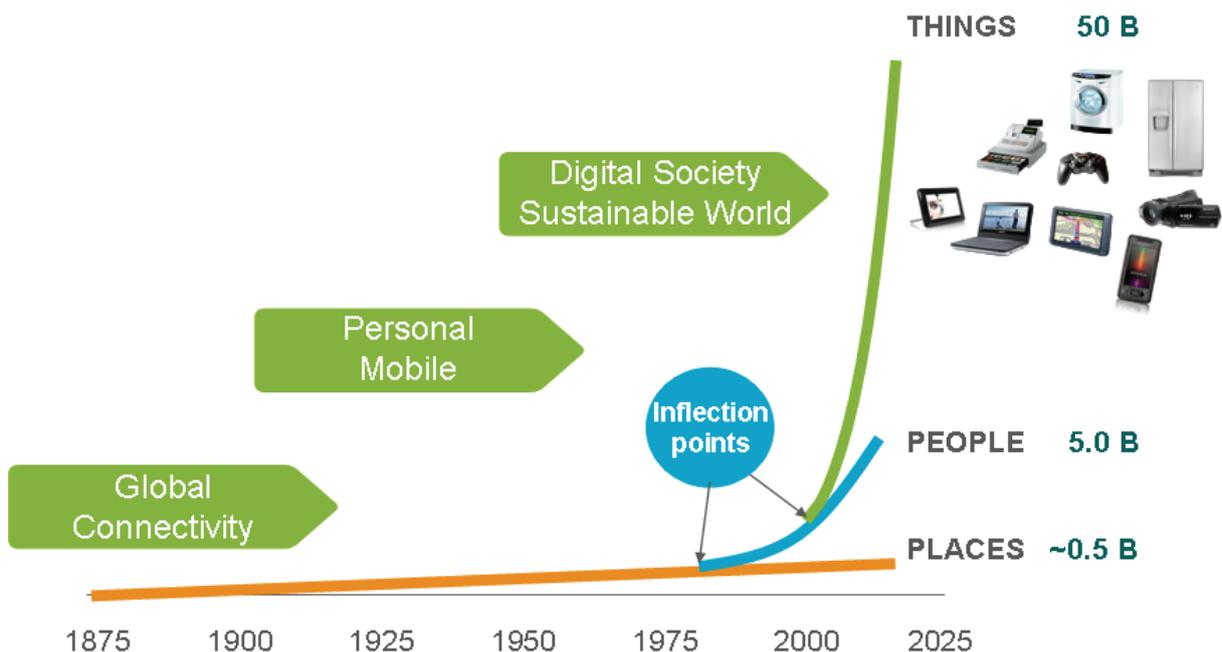
Figure 7: “Traditionally, getting two was easy but getting three was very, very, very expensive”



i. **New data sources**

New data sources have emerged over recent years due to the enormous growth in the number of internet connected devices and sensors and this is expected to continue: total numbers are projected to reach 50 billion by 2020.

Figure 8: Growth in the number of connect devices and sensors



New data sources include:

- smart phones and tablets;
- remote sensing devices and telematic equipment such as GPS systems that track stolen cars or monitoring systems which can report 'back to base' (e.g. alarms & weather stations) or be uploaded afterwards (e.g. exercise heart rate trackers). Examples of these are the AAMI Claim Assist app and Progressive's Snapshot device (US). The AAMI Claim Assist app allows claimants to start their claim at the scene of the accident, record their location via their iPhone's GPS and attach photos of the incident. Progressive's Snapshot device plugs into your car's diagnostic port allowing information on your driving style, kilometres and times to be sent back to Progressive to impact the amount of insurance premium you pay.
- Social media scores: social media feeds such as blogs, Twitter and Facebook posts, product reviews or multimedia content can be used to more deeply understand customers' risk profiles or personal preferences that give the insurer an indication of what type of risk you are, e.g. participation in certain activities, how and where you socialise, travel or exercise or your attitude and stated preferences. Software and platforms are already available to mine social media data so in time, actuaries will be able to incorporate scores into areas such as pricing and reserving, e.g. as indicators of frequency or severity. Similarly, information contained in social media data can also be used to detect fraudulent claims.

It is important that actuaries and the industry stay in touch with technological developments and be open to the possibilities they can provide while remaining cognisant of its risks and limitations. While there will be practical challenges incorporating social media data into current processes and even developing new methodologies and applications for its use, those who are best able to exploit its benefits in underwriting, pricing, loss control and customer engagement will have a clear competitive advantage.

ii. Data storage

In the past, the storage of additional data had to be weighed against the additional costs. However, the costs associated with the storage of data are reducing dramatically through:

- advances in computing hardware; and
- the advent of cloud computing (the provision of virtualised services over the internet by specialised providers).

Further, new techniques are continually being developed for processing and analysing internal and external data sources. Platforms such as 'Hadoop' and 'MapReduce' already allow the processing of large volumes of data across hundreds or thousands of individual computers to speed up processing time. Advances in Artificial Intelligence techniques such as machine learning will allow insurers to move from back office transactional processing for operational decisions such as setting prices and claims

reserves to more real time decision-making on the front line, such as automated underwriting or suggested product recommendations given a customer's current interactions or behaviours.

Insurance companies will need to weigh up the benefits of Big Data against the costs of establishing the infrastructure and skills needed to run it internally or partnering with a vendor. However, as these costs continue to fall relative to benefits, the bigger question for the organisations will be how deeply they embrace Big Data and into which areas of their business they integrate it. Given the technical skills, experience linking operational data with financial outcomes and training in risk management, actuaries are well placed to be heavily involved in this process.

4.2 Personalisation and proactivity

Personalisation involves innovative means of understanding, and supplying, the intimate needs of individual customers en masse. With the growth in the use of the internet and increases in computing power there has been a much greater ability for marketing departments in all industries to tailor products and services to particular segments of the marketplace, thereby improving customer experience and loyalty as well as reducing costs for their organisations. Examples seen already in general insurance include the rise of segment specific brands (such as Apia, Shannons, Insure My Ride, Just Car) and tailored pricing in personal lines (youi). The rise of social media and the ability of insurers to mine insights from online data sources will continue to drive this trend strongly.

As the use of Big Data techniques increases organisations' capabilities in their core functions, we expect that companies will also use their data more proactively to help customers manage their risks and premiums. While this will be a great exercise in customer engagement, it will also have clear benefits for the insurer through better underwriting and lower claims costs. A great example seen already is BudgetDirect's automated hail warning system which uses feeds from the Bureau of Meteorology to send an SMS to policyholders if a hail storm is predicted. Future examples might include traffic warnings to drivers, especially in wet or hazardous conditions (GPS providers can already send real time warnings of traffic jams), calculators that estimate a household's sum insured based on uploaded photos or video of their possessions (where replacement values for specific items are taken directly from the internet) or marketing particular options given changes in policyholder circumstances (like travel insurance if they blog about booking a holiday).

4.3 Potential barriers

There are a number of issues that may impede the use of information as described above:

- Senior leaders will need to decide how heavily they want to invest in Big Data technologies and where to focus energies to get the best returns from these investments. Technology goals will need to clearly align with the overall strategy for the organisation (e.g. whether to be known for innovative new products, tailored pricing or great customer service). There may be hesitation in some quarters given the high costs required to maintain insurers' current legacy IT systems.
- The change required could be considered just too difficult to take on. Information and communications technology spending in the financial services industry is predicted to grow to \$11.1 billion by 2015 (it was nearly 22% of the entire ICT spend in Australia in 2011) and "the insurance industry has been slower than the banking sector to engage in new technological means of customer engagement". With these levels of investment, clearly doing nothing is a seriously risky option, as smaller, more agile companies will be quick to take market share unless mature companies can find an alternative way to differentiate themselves. Indeed, there is a real possibility that those who don't evolve could cease to exist. Global companies such as Kodak, Blockbuster and Borders failed to respond to technology changes in their industries and have since filed for bankruptcy. In Australia, print media and the retail sector more broadly are currently undergoing massive transformations to try and stave off their own downfalls.
- There is a risk of analysis paralysis – becoming so overwhelmed with information that clear and decisive actions are not able to be made. A key to overcoming this is having a clear strategy outlining the business objectives for the collection and use of data. In this way clear priorities can be communicated across business teams ensuring focus, and information and processes outside key objectives can be minimised to avoid distraction.
- There are concerns about the capture, storage and use of what might be considered peoples' personal information for purposes other than those for which it was originally provided, without their consent. For example: "If I collect information on the music you listen to, you might assume I will use that data in order to suggest new songs, or share it with your friends. But instead, I could use it to guess at your racial background. And then I could use that data to deny you a loan." Clearly, the extension to insurance is a short one. The industry will need to be proactive in defining the boundaries for the use of social media data, and insurers will need to design internal processes to ensure it is use effectively but with appropriate checks and balances. This issue is also one where actuaries, with our training and Code of Professional Conduct, should be actively participating in.

5 Environmental Trends

The general insurance industry will face major impacts from environmental megatrends over the coming decade. These include:

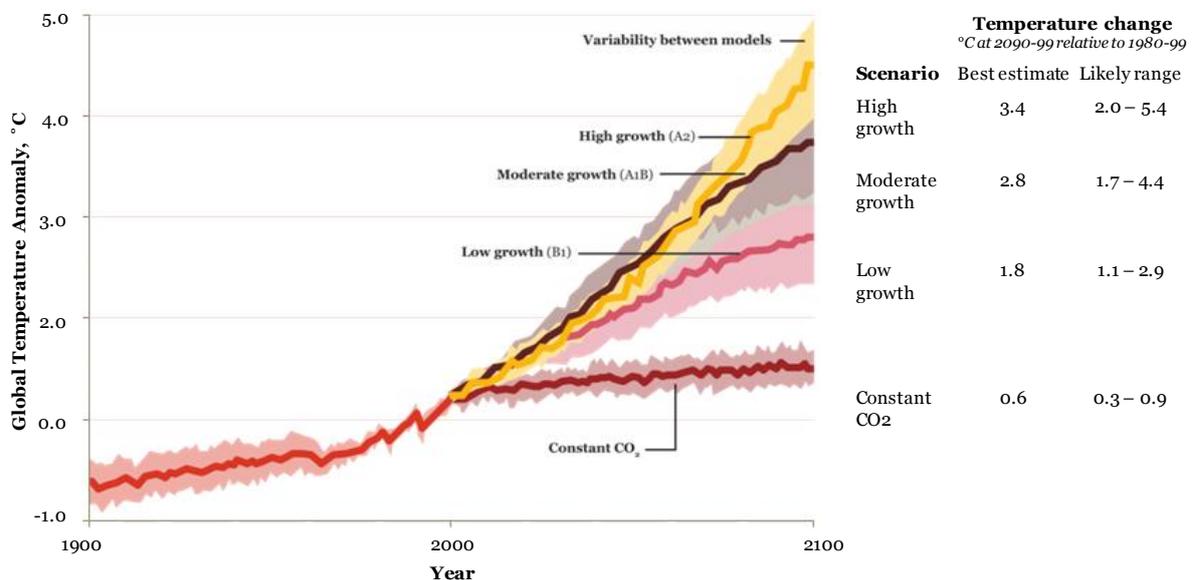
- i. Climate change
- ii. Traditional weather risks
- iii. Environmental damage
- iv. Precious resources management, including energy production

At times, these categories overlap and interact.

5.1 Climate change

The 2011 World Economic Forum's Global Risks Report categorised all major issues impacting the global economy by likelihood and perceived economic impact. Of all issues with a perceived value over US\$500B, climate change was viewed as the most likely. Many scientists theorise that climate change will likely bring a planet that is 2 to 5 degrees Centigrade warmer. The following diagram shows simulations of global warming conducted by the Intergovernmental Panel on Climate Change.

Figure 9: Model simulations of global warming by the Intergovernmental Panel on Climate Change



Sources: Intergovernmental Panel on Climate Change Fourth Assessment Report: Climate Change 2007, NASA Earth Observatory
Notes: Surface warming is relative to 1980–1999

The impacts will generally be greater over land and at high latitudes in the northern hemisphere. It may result in decreased water availability and increased drought in mid-latitudes and semi-arid low latitudes. These changes will generally aid food production in the first world, but hinder it in the developing world. The southern United States—

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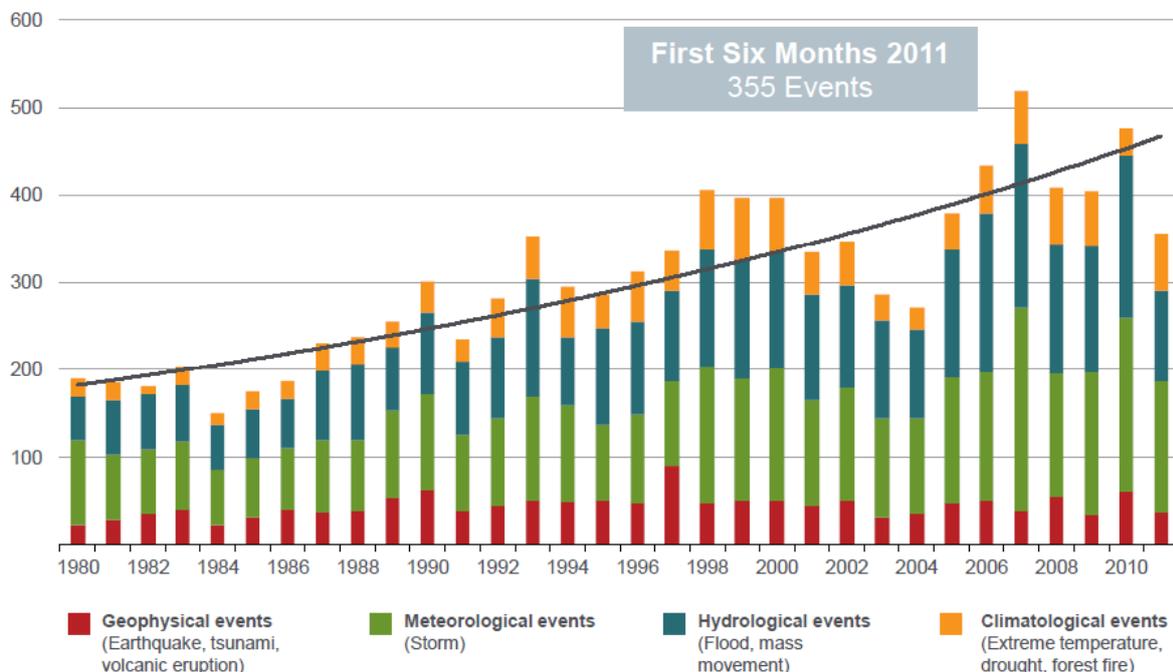
where agricultural production is expected to fall by over 15%, and China—where production may generally rise are the exceptions to this general rule.

General insurers and actuaries are well positioned to help with minimising the impact of changing food and water availability. “Crop hail” has been a product where the traditional purchaser has been farmers looking to secure annual incomes. As the global middle class rises, guaranteeing the price of food and water could become a lucrative business. The purchaser of these products may transition from farmers, to consumers looking to secure food as a predictable portion of their budget. This transition from an industrial product to a consumer product could result in substantial expansion of market size. The purchaser of these products may also transition to governments, for the purpose not of guaranteeing income—but social stability. Actuarial product development skills in this area may unlock new markets, and lead to great social wellness benefits—particularly in poorer countries where access to food is less secure.

5.2 Traditional weather risks

Other major environmental issues deemed “very likely” with a perceived value over US\$250B included natural disasters. The following graph shows the increasing trend in the number of natural disasters reported over time.

Figure 10: Worldwide Natural Disaster – 1980-2011



Natural disaster increases have been driven by flood and epidemic events, including insect infestation. Climate change may also increase the number of annual natural disasters.

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Managing the increasing risks of natural disasters will become more challenging as the population urbanises and moves to warmer, coastal areas—which are most susceptible to cyclones and flooding. Concentration risk will increase in importance for general insurers. The estimation and provision for catastrophe losses have been the traditional domain of actuaries and catastrophe modellers. Actuaries may also be able to leverage these skills to assist with non-insurance economic problems—as evidenced by insurers longstanding dabbling in energy market weather derivatives and catastrophe bonds.

The actuarial profession's challenge will be to expand our client base to wider industry and government, where we can:

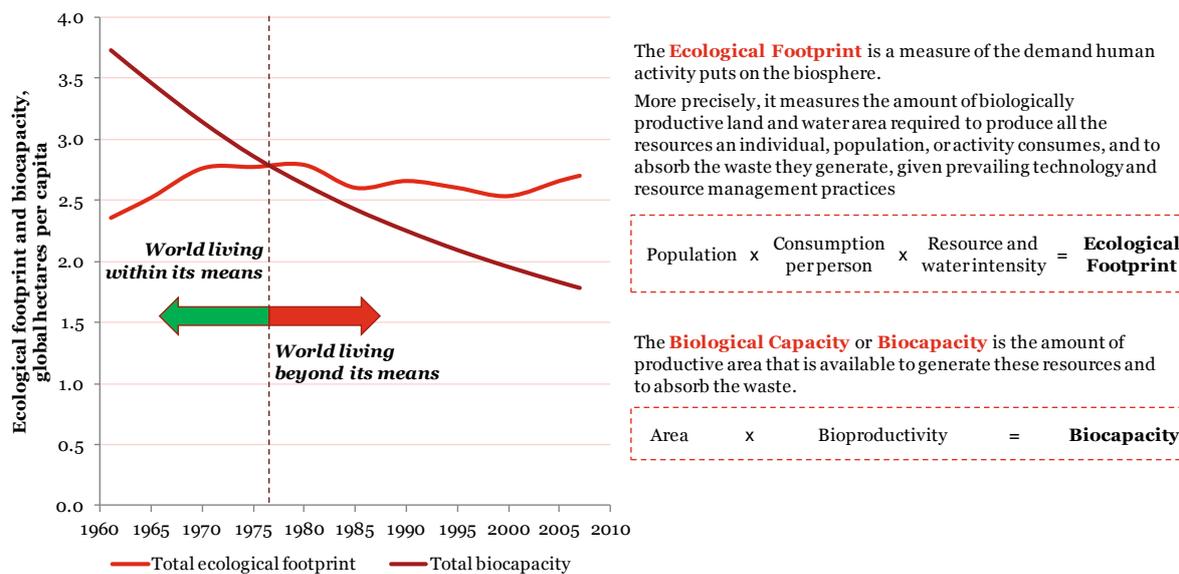
- translate these environmental events into dollars at risk;
- liaise with non-technical managers and government officials to develop risk appetites and mitigation or avoidance strategies; and
- develop risk-cognisant future plans.

City planning, emergency management and corporate risk management staff could be prime markets for these services. Emerging information from Big Data initiatives make these areas particularly ripe for the quantitative analysis actuaries are famous for.

5.3 Environmental damage

Biodiversity is the degree of variation of life forms on our planet and is a measure of the health of ecosystems. Rapid environmental changes typically cause mass extinctions. The following diagram shows that the world has been living beyond its means since the late 1970s.

Figure 11: Global ecological footprint and biocapacity, global hectares per capita, 1961-2007



Sources: Global Footprint Network, Ecological Footprint Atlas 2010; PwC analysis

In traditional markets, actuaries must remain alert to possible “next environmental” risks. Industry constantly innovates to produce new products, frequently using novel chemical and processes. It will be critical for the insurer to charge for the expected costs associated with unproven or risky technology. Actuaries may be able to play a role translating biological diversity into economic costs using data-based, analytical methods. In this way, the force of the marketplace may encourage cleaner technologies to proliferate.

5.4 Resource Management

The last environmental driven megatrend affecting the general insurance industry is the battle for resources. This trend impacts Australia’s economy most acutely, as a key mineral producer. The battle for resources is expected to be more intense for energy, and for precious metals, iron, and rare earths elements central to high-tech electronics production. Reserves of these resources tend to be concentrated in relatively few countries, and they may be hoarded by countries for nationalist or strategic purposes. Disruption to the supply chain could cause economic damage or trigger social unrest. Hence, price volatility will be a central feature of these economically important elements.

Actuaries and general insurers are well placed to develop data-driven indemnification products to hedge against sudden:

- input cost movements, which make production unviable; and
- unexpected loss of access to core inputs.

This is currently the arena of investment banks. However, insurers have helped energy providers manage the cost of production during demand surges using weather derivatives. Similar products could be developed to assist other industrial products.

It will be important to develop triggers based on observable, independent data. For example, daily temperature readings often serve as weather derivative triggers. By contrast, price movements due to mineral hoarding are not fortuitous. Actuaries have a great opportunity to expand our role as financial managers as we can adjust our skills to apply to these issues.

6 Economic Trends

The global economy has had significant impacts on the insurance world. Various factors like fiscal pressure, inflation etc may impact the economy as well as the insurance world. An example from recent history is the global financial crisis (GFC) in 2007 -2008 which was considered the most severe economic downturn since the Great Depression. Although there were no insurer failures in the Australian insurance industry during this period, it became apparent that the existing capital framework may not adequately protect insurers in very stressed market conditions. This resulted in APRA performing a major overhaul of the capital framework for Life and General Insurers. Unlike previous cycles, emerging economies quickly recovered from GFC, while developed countries are still struggling to get back on their feet.

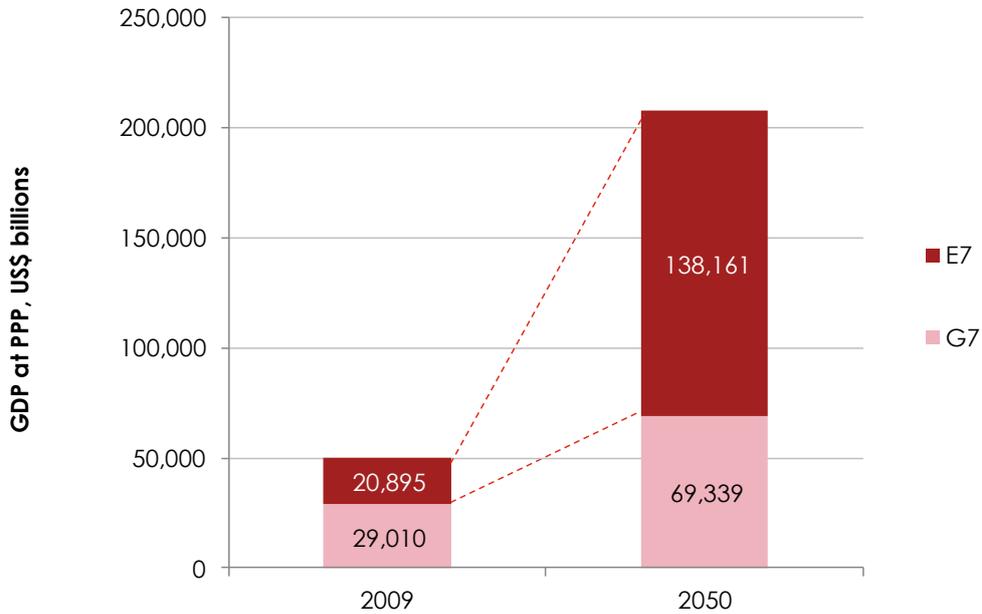
6.1 Rise and interconnectivity of Emerging markets

Over the past couple of decades the world's economies have become more interdependent, however the differences in growth between developed and emerging markets have increased. Trends observed include:

- The diminishing power and influence of the US, Europe and other OECD nations due to the liquidity and debt crunch precipitated by the GFC.
- The bailout of Western financial institutions following the financial crisis has contributed to high budget deficits in many developed countries, sovereign debt crises and a depreciating US dollar.
- Emerging markets have become the engine for global growth. The E7 countries' proportion of global GDP has been increasing over the past 20 years.
- From an insurance perspective, 25 of the 30 largest developing economies (in GDP) experienced total non-life premium growth of over 50%. Overall, premiums declined by 1.9 percent in developed countries, but increased by 7.1 percent in developing economies.

Given the above observed trends, economic growth in at least the short to intermediate term is expected to be stronger in emerging economies. The following graph compares the projected GDP growth for developed versus emerging markets.

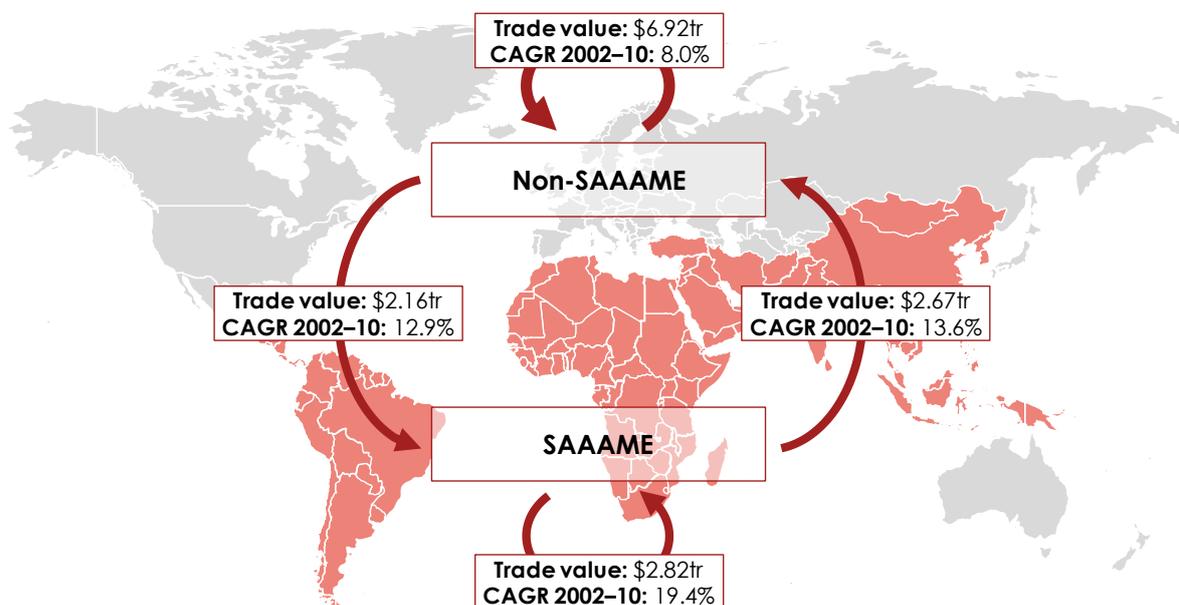
Figure 12: GDP of G7 and E7 countries



Sources: PwC World in 2050 (January 2011); Banking in 2050 (May 2011); PwC analysis
Notes: G7 = US, Japan, Germany, UK, France, Italy, Canada; E7 = China, India, Brazil, Russia, Indonesia, Mexico, Turkey

In addition to the growth of the emerging markets, the interconnectivity of the trade and investment flows between them are growing much faster than the traditional routes from developed-to-emerging and developed-to developed countries. For example, Brazil's largest trading partner is currently China. Indeed, South America, Africa, Asia and the Middle East (SAAAME) are emerging as an increasingly interconnected trading zone, which, in physical terms at least effectively bypasses the West.

Figure 13: World trade flows, SAAAME and non-SAAAME, US\$ trillions, 2010



Sources: WTO; PwC analysis

6.2 Reasons for the growth of emerging markets

The shift in growth from developed markets to emerging markets is due to:

- Large working populations - In the developed world, the old outnumber the young. In emerging markets (except China) the working age population will continue to outnumber the dependent population, and thereby result in more productive growth. The SAAAME region also has a large supply of well-educated professionals.
- Rising middle class - The rise of the middle class in emerging markets is fuelling increased consumption, which is leading to impressive small business growth. Growth in the middle class will be particularly fast for Asia. This is especially true for China and India.
- Heavy government spend - Government infrastructure investment, population growth, new businesses and wealth creation are driving growth in construction, land development, energy and transportation sectors, all of which are creating a greater need for insurance.
- Access to resources - The SAAAME region has access to a significant portion of the world's natural resources. It also has substantial manufacturing capabilities and access to the labour to support this.

6.3 Impacts on the Insurance Industry and actuaries

The increasing attractiveness of the emerging markets, combined with uncertain growth in the developed world and stricter regulatory guidelines will make carriers re-evaluate their strategic goals towards developing countries. This creates different scenarios for insurance industry competitive dynamics. These are discussed below.

i. Globalisation of the insurance world:

The growth and interconnectivity of the emerging markets creates significant headroom for growth that can be freely targeted by domestic and non-domestic players. The insurance industry as a whole could become more globalised as countries harmonise regulations, standardise practices and distribute products across borders. This could lead to:

- greater market share for global insurers and economies of scale;
- products that are able to integrate multiple parts of the value chain, regardless of location; and
- harmonisation of actuarial professional standards and actuarial societies.

Actuaries may be able to assist insurers expand into foreign markets by juxtaposing their knowledge of the local insurance industry with the expected socio-economic factors of the emerging markets to help in areas like product design, pricing and reserving.

ii. Twin-Track growth

Emerging markets could continue to grow at around eight to ten percent a year, while the developed world could continue to experience sub-two percent growth.

Given lower growth prospects for Insurers in the West, expanding to SAAAME may offer an opportunity to secure continued growth. However, there are a number of factors challenging the expansion of Western Insurers in these high-growth markets, including:

- *The rapid pace of change:* The rise of these economies is happening far more rapidly than expected and insurers need to adapt their business models before SAAAME competitive structures mature;
- *Increasing regulatory barriers for foreign institutions:* Driven by the recent financial crisis, many SAAAME countries are raising the barriers to entry for foreign Insurers/financial institutions, with some regulators taking the attitude they have little to learn from the West ; and
- *Different country risk and business environments:* Western financial institutions need to gain a good understanding of the different legal and regulatory frameworks, political systems, business ethics and cultures of SAAAME countries.

Thus, twin-track growth and the loss of the developed world's authority in the wake of the financial crisis could result in greater protectionism by countries. The increased regulation does not simply mean that actuaries do compliance and report related work. Actuaries can play an important role in understanding the implications of these regulations and conveying them to management.

iii. The middle path

In-between these two extremes, is another scenario as follows:

- Savvy insurers in developed countries can still grow in their local markets, while at the same time targeting the emerging countries for growth. As an increasing amount of emerging-to-emerging market commerce misses out the West altogether, western insurers will need to find ways to tap into business flows they

may never physically see. Success will depend on being able to deliver products and capabilities that domestic players cannot do and being sensitive to the realities of doing business in these countries.

- Emerging market players have an opportunity to reshape insurance products for their local markets while going global to build their technical expertise. Competition for talent, as discussed in the Social Trends section, will grow including that for actuarial skills. SAAAME insurers will need to develop their organisational skills to keep pace with the growth of SAAAME markets, to build the customer-centric models and to construct business models and partnerships that are relevant to the markets they serve.

An extension of the role of an actuary would be to understand and explain the capital requirements of the various new markets the insurer may be aiming at.

When considering this driver in isolation or as part of interplay with the other drivers discussed in this paper, the rise and interconnectivity of the emerging markets is expected to impact the insurance world either directly or indirectly and hence the work of actuaries. Regardless of the scenario, actuaries have the opportunity to further evolve and sharpen/adapt their managerial and soft skills to supplement their technical expertise.

7 Political Trends

The political environment for financial institutions is changing and opportunity exists for those who see it. In the past, Western capitalism and values were dominant with Laissez-faire responses to the financial system. Looking at the future, the major political trends to impact the general insurance industry are:

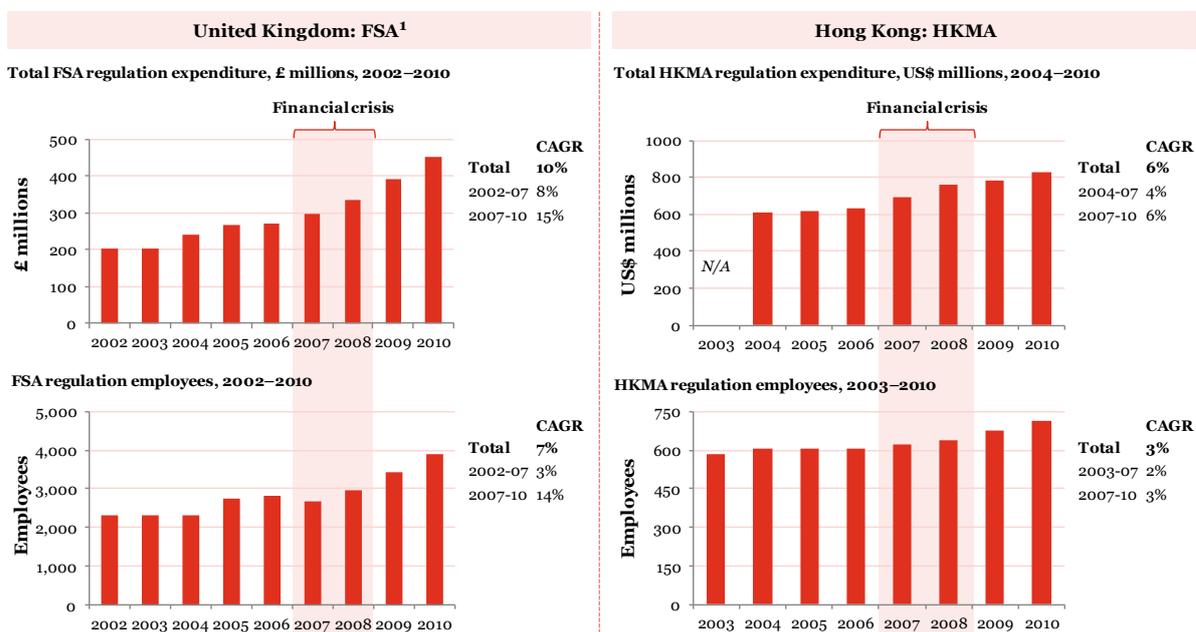
- i. Global Instability
- ii. Rise of state-directed capitalism

7.1 Global Instability

The two key drivers of global instability are:

- Regulatory change
Financial shocks bring about the biggest regulatory changes such as the Securities Act of 1933 after the Great Depression and the Troubled Relief Program (TARP) after the Global Financial Crisis. However, these regulatory changes do not always produce the desired outcomes and sometimes bring about unintended consequences. For example, Basel II incentivised banks to seek favourable capital outcomes through securitising risky assets to 'manufacture' apparently risk-free assets, which turned out not to be risk-free at all. Moreover, these regulatory changes bring with them intense regulatory oversight. These changes translate into significant compliance and cost issues for insurers, which may also impact competition in the market and the pricing of products. As examples, the following figure shows the regulation expenditure and employees in the UK and Hong Kong.

Figure 14: Regulation expenditure and employees in the UK and Hong Kong



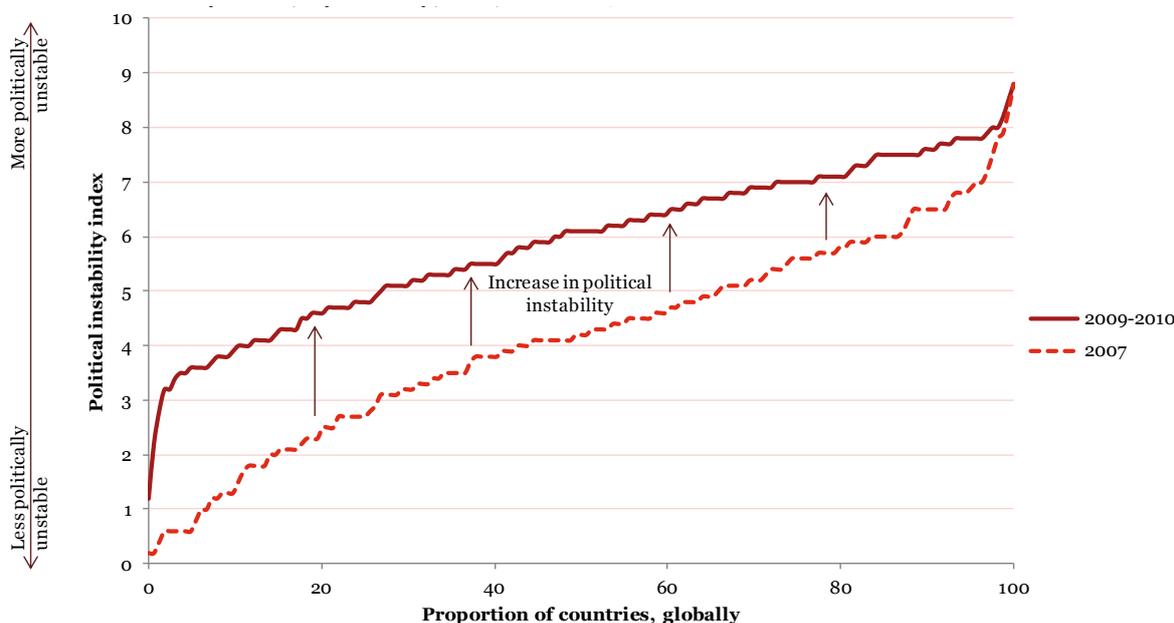
Sources: FSA, OCC and HKMA websites; PwC analysis

Notes: The FSA is the Financial Services Authority, and the HKMA is the Hong Kong Monetary Authority, which are the main financial regulatory bodies for the UK and Hong Kong respectively; ¹ The FSA's 12-month reporting period begins in April of the year reported

These regulatory changes can either stifle existing business models for the incumbent insurers to compete or open up new models and opportunities for both new players and incumbents. The changes in regulations require Actuaries to not only understand them and carry out the compliance work, but also to explain the implications to the management.

- Political and social unrest
Political stability and global competitiveness are important for fostering economic growth and attracting foreign investment. However, over the past three years the world has become increasingly unstable culminating in the recent 'Arab Spring'. The following figure shows the Political Instability Index by country.

Figure 15: Political Instability index, by country, 2007 and 2009-10



Sources: Economist Intelligence Unit ViewsWire; PwC analysis

Note: Index measured for 164 countries; The political instability index represents the level of political instability in a country, with a greater value indicating that the country has greater instability. The chart shows the global change in political instability between 2007 and 2009/10. It plots the index against the proportion of countries with that score. For example in 2007 c.35% of countries had a score greater than 5 whilst in 2009/10 c.75% did, indicating greater levels of political instability in 2009/10

In the near future, driven by a range of factors including fiscal austerity, food prices, corruption and the transformational aspects of social media, old political structures will be challenged and a loss of confidence in the financial sector could lead to destabilisation. Likely scenarios can be either that political instability continues impacting both short- and medium-term returns as well as nations previously assumed to be highly stable or a regime change might have a positive effect on GDP growth, creating significant opportunity for expansion. Insurers will have to monitor the implications to their risk management and investment strategy and adapt accordingly.

The impact of global instability on insurers will depend both on the region and the insurer itself. The flexibility and adaptation of the insurer will be imperative to its survival through periods of instability.

7.2 Rise of state-directed capitalism

State-directed capitalism refers to the size of the public sector, relative to a country's overall GDP, reflecting:

- interventions made by governments in the affairs of the private sector;
- the role of government in implementing economic strategies; and
- government-to-government trade.

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The financial crisis has given rise to increased state intervention in many countries around the world, particularly within the financial services sector:

- The crisis has led to short-term interventions by governments to stabilise the financial system and implement regulatory and tax reform.
- The crisis has strengthened the belief among some emerging countries that the West's free market capitalism is not the best model for their countries.
- Emerging countries, where wealth is growing fastest, have a history of state-developed economic development strategies, and a willingness to intervene when business transactions are not in the national interest.

The following figure shows that since the onset of the financial crisis, there has been a significant increase in nationalisation, where governments are buying back assets.

Figure 16: Government's private sector acquisitions, 2001-2010



Sources: Dealogic Analytics; PwC analysis

State-directed capitalism is not a new phenomenon in many economies around the world; however, the reality is that the nature of state intervention is changing and insurers must understand these changes and align to the priorities of an increasingly diverse range of stakeholders with a vested interest in their commercial affairs.

7.3 Shaping the future

Insurers will need to be active participants in the debate on regulatory and tax reform and increase efforts to influence government policy and legislation. This will help ensure that government interventions are economically sound and effective. This will mean engaging and developing relationships with a diverse range of stakeholders, some of which may be unfamiliar to the organisation.

Governance and internal reporting structures must be reassessed to ensure the right information is reaching the board and senior executives. The role of the finance function needs to be expanded as regulation becomes central to business strategies. Scenario testing will help shape forward-looking strategic judgements. The risk management function will need to understand and manage new risks from rapid (and often reactive) business model adaptations. Operations must become more agile and capable of resizing in order to accommodate changing market conditions. Actuaries have a role to play in assisting insurers navigate through these changes.

8 Next Steps

8.1 Next steps for insurers

We have outlined the STEEP drivers and their impact on general insurers. What choices do insurers have in responding to these trends?

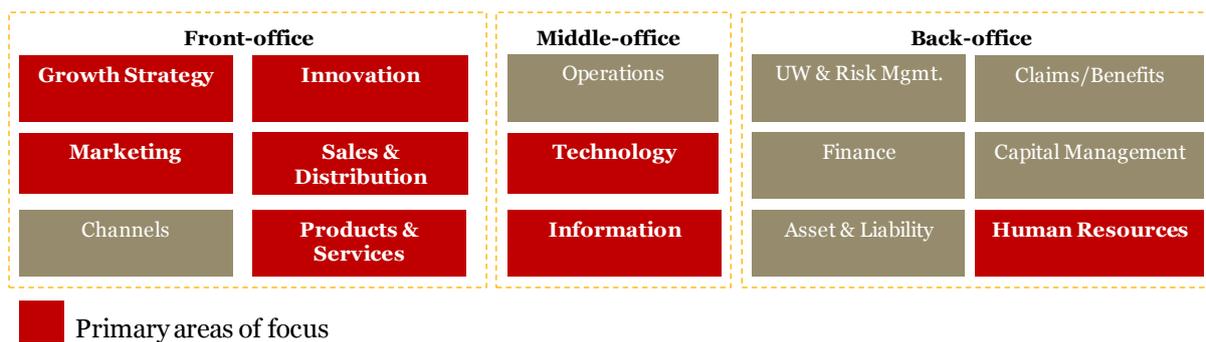
Insurers can either respond via operational innovation or product innovation or a combination of both. Operational innovation redefines the economics of existing operational models, improving profitability through efficiency or effectiveness. Product innovation capitalises on unmet consumer needs.

We propose four specific possible strategies for general insurers:

- i. Innovators - Insurers may want to reshape their future through innovation, focussing on research and development of new products and investing in analytical decision-making through the use of new technology.
- ii. Expansionists – Insurers can grow through expansion by leveraging off their existing capabilities and expanding globally or into new customer segments for existing products or by using new distribution channels.
- iii. Fast followers – Insurers may decide not to be the leader but be agile enough to follow the leader and establish a strong presence.
- iv. Survivors - Insurers may focus on short-term performance and survival by waiting for the majority of the industry to adopt new ideas and practices before adopting them.

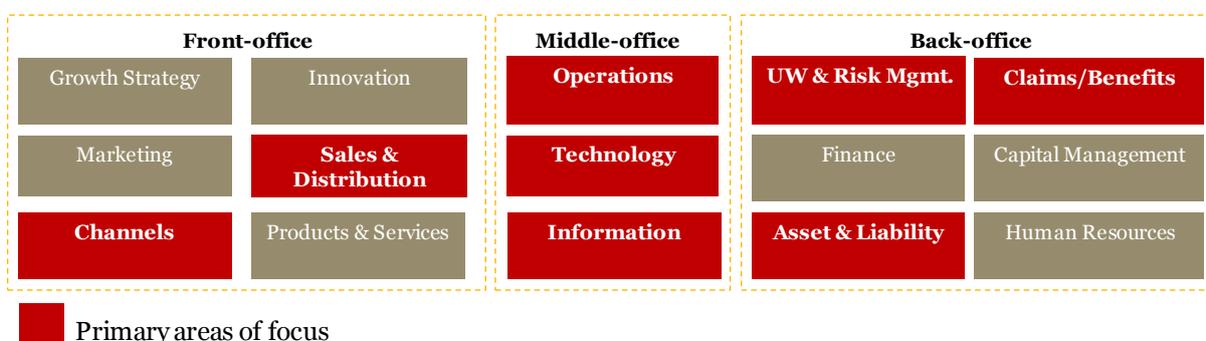
Innovators and expansionists will tend to invest more in front-office functions, whilst fast followers and survivors will tend to focus more on back-office activity. This is depicted by the following diagrams.

Figure 17: Innovators and Expansionists



Source: PwC Analysis

Figure 18: Fast Followers and Survivors



Source: PwC Analysis

8.2 Next steps for actuaries

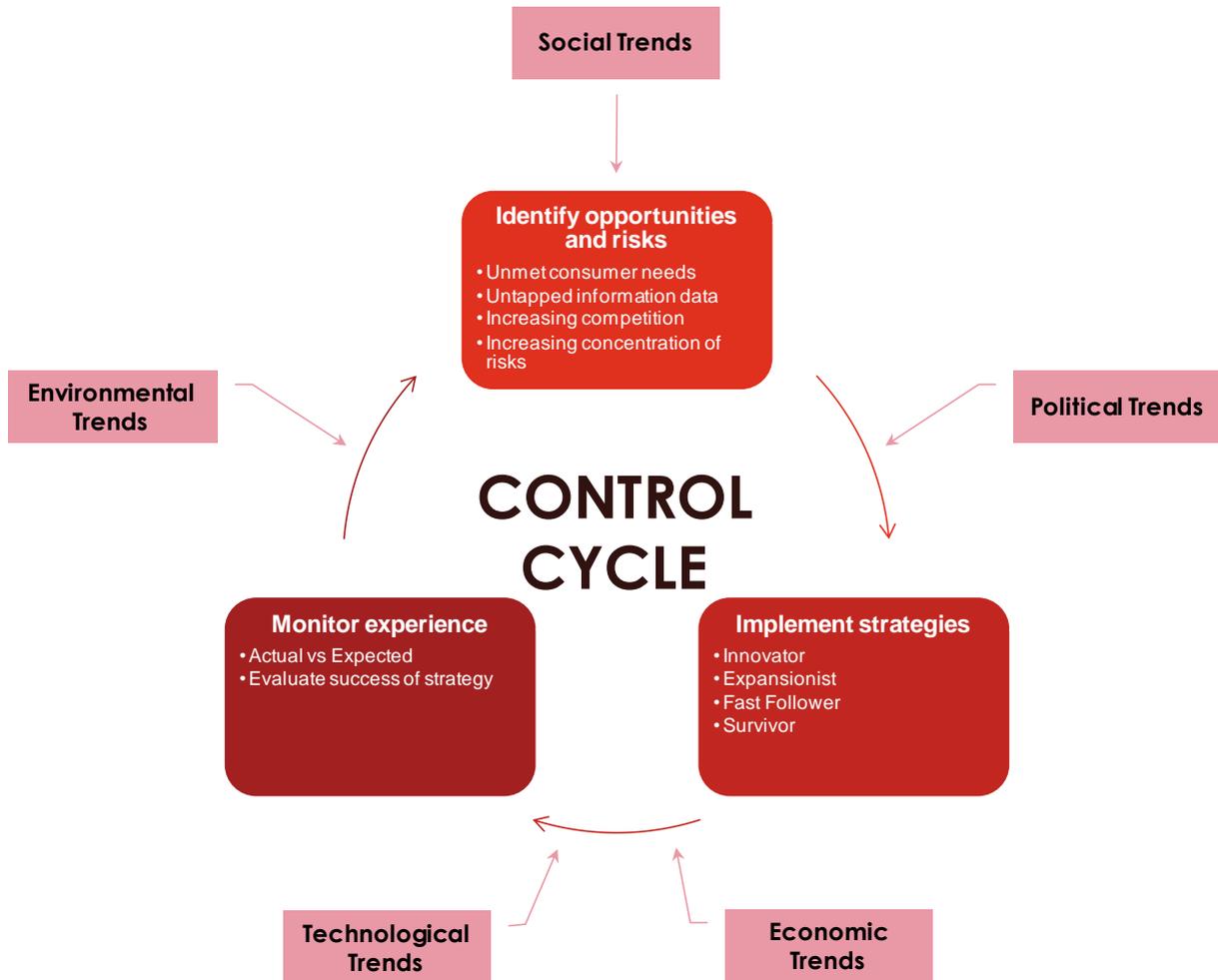
To the extent that actuaries have input into the various functions or are responsible for providing advice in those functions, the work of the actuary will be impacted. We could choose to take a really micro view and just talk about how the valuation and pricing actuary may want to react to these trends. Alternatively, we could take a step back and think about what these changes mean to our profession. As actuaries, we may have been programmed to consider and assess the potential risk of any situation presented to us in the first instance. Whilst this may be a good habit, stopping there would really inhibit us from being a thriving profession.

Change brings risks but change also brings opportunity. The changes that are expected to emerge for the general insurance industry bring immense opportunities for the actuary. In our view, it is the actuary who has the technical expertise and understanding of how each function of the insurer interacts and works together, hence it is the actuary who is in the unique position of being able to:

- make a comprehensive assessment of both risks and opportunities, even in areas where actuaries may not have traditionally worked
- input into strategies for risk management, capital as well as growth

- construct monitoring tools that help track the impact of trends and the effectiveness of strategies
- feed these results back into informing risks/opportunity assessments and fine-tuning strategies

Figure 19: Control Cycle



The following table summarises more specifically how the actuary can help with the insurer's strategy and the extent to which we are equipped to do so.

Table 1: How Actuaries can help?

Insurer actions	How Actuaries can help?	Existing skills/experience	Skills to develop
Expand to other countries for growth	Analyse consumer demand and risk profiles. Estimate risk premiums and investigate price elasticity. Compliance with regulatory requirements.	Apply technical skills to model demand, risk premiums and price elasticity, leveraging experience from local markets.	Need to understand new culture and environment and their impacts on demand and risk profiles, as well as foreign regulatory requirements.
Change marketing to align with behavioural, demographic and technological changes	Model historical relationships between product demand and behavioural/ demographic/social media measures to inform marketing strategy.	Apply technical skills to model sales and profitability of targeting different parts of the market.	Marketing and sales is not a traditional actuarial area but actuaries have a lot to offer given their analytical and projection skills. May need to build relationships with marketing department/learn jargon.
Change underwriting, pricing and reserving to align with new risks/hazards accepted	Project claims costs based on experience from similar risks. Analyse claims experience as it emerges to inform underwriting policies.	Pricing and reserving are traditional areas for actuaries. There should always be strong feedback loops to underwriting.	Understand new coverages, paying particular attention to unintended coverages of risk. May need to look to international experience if similar products are offered abroad.
Allow for changes in risks accepted for capital calculation and risk management purposes	Understand the new risks accepted and how risks will be mitigated by the risk management framework. Residual risks need to be provided for in capital.	Capital calculation is a traditional area for actuaries, but methodology is still developing. Risk management skills are developing.	Although actuaries are generally in a good position to have a feel for how new risks may impact on the insurer, actuaries need to develop more skills to quantify the impacts of these risks.

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Insurer actions	How Actuaries can help?	Existing skills/experience	Skills to develop
Attract and retain talent, outsourcing to reduce costs	Have input into the outsourcing of actuarial services to actuaries in emerging markets, providing advice on what to outsource and how to maintain quality control.	Existing actuaries have local experience to compliment skills of non-local actuaries, and are able to check the reasonableness of the work.	Actuaries no longer required to perform straight-forward technical analysis can channel their experience into other areas that require more complex analysis or problem solving. Actuaries will need to look harder for areas to add value and develop new skills to supplement existing skills to work in these areas.
Product innovation	Not a traditional area for actuaries but generally able to estimate the financial impact of new products and provide some input into the risks involved.	Apply experience gained from other products.	Actuaries often only get involved once product specifications are released and financial implications need to be assessed. If actuaries want to be involved earlier in the process, they will need to develop greater awareness of market needs and potential risks that may arise as a result of changes in the environment.
Increase usage of social media as distribution channel	Analyse and project the risk profile of policy holders that would be accepted through this channel and the implications for claims experience, pricing and profitability.	Apply existing technical skills to analyse/project profitability of new distribution channel.	Different social media sites may attract policy holders with different risk profiles. Actuaries need to gain a better understanding of users of these sites.
Using Big Data techniques	Adopting new techniques to enhance output of current work performed as well as championing its use in analysis for new markets, products or distribution channels	Apply technical skills to solve business problems - here it is just a new technique	Need to be proficient in the specific technical requirements for running Big Data, e.g. software, as well as gain an understanding of its strengths and weaknesses

Insurer actions	How Actuaries can help?	Existing skills/experience	Skills to develop
Better allowance for catastrophe claims	Analyse past catastrophe experience. Understand how portfolio may have changed by geographic area or risks accepted from a risk concentration perspective. Project future catastrophe experience and allow for impacts on pricing, reserving, reinsurance arrangements and capital.	Catastrophe claims modelling is a traditional actuarial area.	Understand the impact of environmental changes on the incidence and severity of natural disasters and allow for these in projections.

9 Conclusion

In this paper, we have collected some facts and projections of the STEEP factors expected to impact on the general insurance industry globally. Whilst we may have only scratched the surface in terms of our discussion of these, we hope that we have made an impact by increasing awareness of these trends amongst general insurers and actuaries and provided a framework for giving considerations to these trends in developing responses and strategies.

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