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beyond uncertainty

TURNING RISK INTO VALUE

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Preamble

The motto of the Institute of Actuaries 'Certum ex Incertis' ('Certainty out of Uncertainty') encapsulates the raison d'etre of the actuarial profession and its means of 'adding value'. As we enter the 21st century this seems particularly relevant. Our lives and our society generally are increasingly marked by uncertainty generated by continual change driven by globalisation, technological innovation and a transformation and/or breakdown of traditional business, economic and social structures.

Both the public and private sectors need to respond to the challenges wrought by these changes and actuaries are increasingly called upon to contribute to the development of policy, business and strategic plans created in this environment of rapid and increasing change and uncertainty. In addition, virtually every political or government decision and the operation of all business enterprises involves those concerned in taking what are commonly referred to as 'calculated risks'.

Calculating risks is at the core of what actuaries do. The origins of the actuarial profession involved creating solutions for such problems to create viable insurance mechanisms to manage risks and improve community welfare. Today, developments in fields as diverse as telecommunications, genetics, the natural environment and finance provide challenges and opportunities for actuaries to take a more pro-active role in shaping improved risk analysis and decision making processes. Accepting this challenge will take the profession 'beyond uncertainty' to achieve better 'value added' future outcomes for both decision makers and the communities and stakeholders they serve. But failing to adapt could result in stagnation and an eventual marginalisation of the profession from emerging issues in business and society generally.

In the balance of this presidential address, I intend to explore the current forces driving change and risk, consider the implications for the profession and review a number of developments of current professional interest to Australian actuaries where the Institute of Actuaries of Australia (IAAust) has been active.

On a personal note, I have found the writing of this presidential address to be a professional challenge in itself and I hope that readers will enjoy it as much as I enjoyed writing it. I would also like to acknowledge the assistance provided to me in producing this address, particularly from Catherine Beall and Jane Ferguson of the IAAust and to various colleagues who were kind enough to read and comment on drafts.

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Part 1 : Driving Forces of Change and Risk

It is commonly recognised that we are living in a time of dramatic change. However, the driving forces of change and some of the inherent risks and other implications for our society (and the actuarial profession) are not generally so well recognised, nor are the interactions between them. It is worth examining some of these issues further in order to better understand their likely impact.

In this address, I will focus, in particular, on the following driving forces of change:

(1) Genomics and Genetic Engineering

(2) Information Technology, the Internet, E-business and Industry Convergence

(3) The Impact of Globalisation and Transparency in Financial Reporting and Regulation

(4) The Recognition of 'Irrational' Behaviour in Economic Decision Making

(5) Sustainability and the Environment

(6) Increasing Individualism, and

(7) Falling Fertility, Longer Lives and an Ageing Population

1.1 Genomics and Genetic Engineering

The science of genomics, which seeks to map and understand the DNA that builds and sustains life, has captured headlines around the world with the recent announcement that the Human Genome Project has been largely completed. This science will change the way we look at every person, animal, plant, bacteria and virus on this planet. It will give our society the technical knowledge to study, design and build at a molecular level and the capacity to recreate and modify the instructions that make life itself.

As the discoveries, techniques and tools of this molecular revolution are applied we will witness a massive restructuring of human endeavour affecting all aspects of our society – whether it be in politics, sport, business or industry. We will also need to deal with some very fundamental social, philosophic, and ethical issues arising from these developments as they impact conventional thinking in areas such as medicine, behavioral diseases, agriculture and chemical warfare.

Whilst predicting the course of such developments is far from an error free process, it is clear that we will soon obtain important new insights into the ageing process and death rates. One recent article focusing in this area suggested that up to half of the currently observed human life span after age 30 could well be directly related to genetic factors with the remaining half related to factors such as accidents, the disease history of the individual, socio-economic status and nutrition. This suggests that mankind will soon have the capacity to extend the normal human life span in developed countries from around 76 years (for males) and 81 years (for females) to lifespans in the order of 120 years or more.

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The implications of such developments are very far-reaching. The concept of a generally accepted retirement age of 60 to 65 years would almost certainly become obsolete and radically alter individuals' perceptions of their working and personal lives and plans. The implications are enormous for the delivery and cost of health services, retirement income planning and policy (for both individuals and government) and for the resource allocation in our society generally that will increasingly move from the 'young' to the 'old', through sheer weight of numbers (and votes).

It is perhaps worth speculating for a moment as to where this may lead and observing in this context that even the world's most committed democracies have a rather cosmetic quality; because in the end, the lives of individual people, and the destiny of humanity as a whole, is only superficially determined by governments, elected or otherwise. From the perspective of history we can see that for at least two million years, since human beings first began to develop various technologies, our individual lives and our overall fate, has largely been shaped by those technologies; and in the main those technologies have effectively followed their own logic. The resulting impact on the way we live today and the effect of the use of technology on the world at

large is huge. The rate of change outstrips the transformations that our ancestors brought about, a hundred or a thousand fold.

Now the science of genomics and its resultant group of high technologies could change the world and our attitude to it even more radically than we have seen before. If this science and technology is applied adroitly, it could turn out to be the most powerful tool mankind has ever controlled and be used to solve many of our present problems, and avert pending disasters in the future.

More than any other science, it could help us to provide agricultures that can feed ten billion people, but do so humanely and without destroying the rest of the environment. It could provide methods of manufacture that preserve fossil fuels and reduce, or even reverse, the pending greenhouse effect; and transform the economics of the present day 'Third World' countries. It could provide medical techniques that defeat most infections within a century from now, and probably begin a serious attack upon cancers. For the conservation of plants and animals, genetics is already vital. Without the proper application of genetic techniques we cannot hope to save more than a token proportion of other species on earth from extinction.

On the other hand, if we fail to remain in control, then this science and its associated technologies could equally be employed for ends that may well be considered evil, or at least deeply sinister; and which, if things go wrong, could trigger a chain of biological destruction that could outstrip anything we have seen before.

A considerable risk exists that we may not deploy this science and technology astutely, to seize what there is to be seized, and avoid the potentially harmful side-effects simply because we, as a society, have not defined what it is that we want to achieve from this technology. To some extent it can be argued that we still have the attitude of the stone age; that is we follow our noses. Our stone age ancestors did not plan the impact of new technology, it evolved according to natural selection. If we do the same we are bound to favour short-term advantage over long-term costs so that in the long term major problems accumulate to be solved. A second problem is that the technology is not well and widely understood so that concern, frustration and anger will grow as evidenced by the attitude taken by many consumers to genetically modified food. The president of the American Council on Science and Health was recently quoted as saying: *'Biotechnology has become the new turf for terrorists who want to stop progress … and what weapons do they wield? Hyperbole about risk and mass marketed fear.'*

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As people take sides in such debates gaps in knowledge become credibility gaps if a crisis emerges or if the message is mismanaged or plain untruthful.

All this poses obvious challenges for both our society as a whole and for the actuarial profession. There are major implications for actuaries and those they advise including insurance companies and their customers, providers of medical and long-term care services, superannuation funds, funds managers, investors, financiers and governments. I will discuss some of the current challenges for the life insurance industry arising from developments in genetics in more detail in Part 4 of this paper.

One particular challenge for the actuarial profession arising from these developments is the need to inform public debate and ensure that the fundamental difference between voluntary risk rated insurance and community based social insurance systems is well understood in the community.

1.2 Information Technology, the Internet, E- Business and Industry Convergence

The growth of the Internet has created a new transformational phenomenon, creating in Bill Gates' words, 'the digital nervous system' for organisations and the global community. In just a few years the Internet has already destroyed many ways that traditional businesses thought were sacrosanct, disintermediating established value chains. Notwithstanding all the hype about the 'new economy' and the excesses of stockmarket speculation surrounding this phenomenon, there is no doubt that the Internet and E-Business are redefining how organisations in the 'old economy' reach their customers and eliminating many long-standing and carefully constructed barriers to entry in many businesses.

The Internet is a paradigm for the changing world, transversing and defying national and cultural boundaries. Its continued development reinforces globalisation and grants a new freedom and empowerment to the individual – whether as a consumer, an employee or a citizen - by giving access to low cost information. Its very nature defies the capacity of sovereign states to regulate the World Wide Web. There is little doubt that

we are witnessing a transformation that will be every bit as revolutionary as the Industrial revolution, and the widespread adoption of major inventions such as railroads, aircraft, mass produced motor vehicles and the transistor.

Organisations that fail to adapt to E-Business will almost certainly become its casualties. E-Business is remaking the business world in its image by:

- creating an unprecedented wealth of information to both customers and businesses that will give customers more bargaining power while enabling businesses to anticipate and satisfy individual needs with pinpoint precision;

- changing conventional concepts and rules about strategic alliances, outsourcing, competition, industry specialisation, and customer relationships;

- redefining virtually every business process and function, from the back office to supply chains, financial reporting, and customer support;

- blurring the lines between industries, thereby allowing organisations to profitably combine dis-similar resources and provide innovative products and services in multiple markets; and

- challenging every business – large and small, centuries old and new – to reinvent itself for a world that will operate at net speed.

The end result will be that business and E-Business will become one and the same. This basic economic revolution is spreading through many different types of industry. The first affected are physically light products like music, films, software and financial transactions. Then it moves into areas of occasional but knowledgeable purchasing such as cars and appliances, reducing the cost of information and altering value chains in more and more industries. This gives more power and choice to customers who become more aware of price and value comparisons and the ability of some suppliers to harness this new technology to build tailored products to order rather than trying to sell a mass produced product from inventory. Such an approach slashes inventory costs and delivers a product that is better suited to the customer's requirements. When combined with sophisticated data mining techniques and the ability to build on-line communities to give added value to customers, such information technology rapidly becomes customer relationship technology and a source of sustainable competitive advantage for a business that utilises it well. In an environment such as this any intermediary business such as a distributor, dealer, broker or agent that does not adapt becomes very vulnerable to disintermediation, particularly by competitors who do not have any distribution channel conflict.

These changes are redefining what makes a successful business model. Breakthroughs in information technology and the spread of the Internet are creating new ways of doing business and communicating that sweep away the infrastructures that organisations spent most of the last century creating.

Consolidation – the combination of like entities in like industries, often on an international basis – was common in the 1980s and early 1990s. In that period many factors created fertile ground for global, large-scale, efficiency-driven business combinations: deregulation, capital availability, the lowering of international trade barriers, and massive privatisation.

Today, however, consolidation has given way to convergence. Going well beyond the combination of companies to achieve efficiencies, convergence is a phenomenon driven primarily by changing relations between businesses and consumers. It is dissolving the boundaries that traditionally kept certain businesses apart. In the process, it is redefining many industries and markets.

What is driving convergence? Customers – specifically, customers empowered by technology. Today's Internet-empowered consumers, including business to business consumers, are using their ability to interact effortlessly with suppliers to make their needs known. They are choosing precisely what they want.

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These choices are accelerating convergence by compelling businesses to repackage products and services into new offerings responsive to consumer demands. The Internet offers great opportunity to companies that are willing and able to change, but to others it poses a significant threat. Companies affected by industry convergence can profit from the Internet-empowered consumer, but they can also be reduced to commodity status.

Successful companies in converging industries will need to redefine their approach to marketing. Companies marketing successfully to the newly empowered consumer will do so not by selling a single product to legions of undifferentiated buyers, but by capturing a limited set of customers and selling them a greater quantity of product or service packages tailored to their express needs. In other words, they will abandon so-called 'product push' strategies in favour of a 'consumer pull' approach.

Companies in converging industries must also fully exploit customer data to gain a better understanding of consumer trends and use that understanding to reconfigure their product and service offerings. The sources of such data are varied. Internet technology, with its unprecedented ability to capture and record customer behaviour and preferences, is of course, a rich vein of potentially useful information, but savvy companies will also pay closer attention to more traditional sources of information, such as data gathered at the point of sale, stored in and later mined from data warehouses.

They must become more agile and flexible, and keep a sharper eye on core competencies. Succeeding in converging industries means being able quickly to redefine a business based on customer needs; to refocus capital away from non-core activities; and to use the Internet to communicate more quickly with suppliers and vendors, and to establish strategic alliances with business partners that can add value up and down the supply chain.

Successful companies in converging industries will need to be led by courageous decision-makers who are on top of their markets and understand their customers. Such leaders will need the vision to know when even successful businesses have to redefine themselves and the courage to act on that knowledge.

1.3 The Impact of Globalisation and Transparency in Financial Reporting and Regulation

Ten years ago, the fall of the Berlin wall and the collapse of Communism marked a point in history seen by many as the triumph of market capitalism over other forms of social organisation. Since then we have seen a continued general move towards more liberalised markets and privatisation of government businesses in more and more countries and a huge increase in international flows of trade, investment and capital, as well as ideas and information. Business now faces the challenge of competing in an increasingly global market place.

There will be winners and losers in the new globalised economy. Established orders will be overthrown and sometimes the innocent will suffer. Countries and societies will need to protect themselves against globalisation's unexpected, unintended and unwelcome social, cultural and economic consequences.

Turbulence caused by the sloshing of 'hot money' in global capital markets will inevitably cause many, from investors to pensioners, to clamour for action on the part of regulators and government. Protests will occur such as those seen at the World Economic Forum in Melbourne recently and in Seattle last year coinciding with the World Trade Organisation meeting.

National governments are seen as less able to make things happen or even to protect their citizens. Greater global spread of information via the media and the Internet exposes the frailties and weaknesses of government, corporations and other institutions. Governments can no longer control information as easily as previously and thereby control their citizens.

In this environment regulators seek to avoid overreacting, but move actively towards seeking global agreement on issues such as accounting practices, bankruptcy laws, corruption and money laundering. Because practices, priorities and legal structures are different around the world, no single set of standards and rules can be imposed. But everywhere regulators are less tolerant of compromise on the key safety features of an increasingly integrated and complex global economic and financial system.

Driven by the demands of global capital markets and accelerated by the power of new technology, corporate financial reporting is also undergoing a quiet revolution. Investor demands for greater clarity and less management discretion in the reporting of financial performance of companies is leading to the introduction of new accounting standards which are now usually global and increasingly focused on using current and prospective, rather than merely historical, financial information.

Most obvious in today's environment of cross-border investment is a need for transparency in global capital markets. There is general agreement about the need for greater global convergence and harmonisation in corporate reporting. Many believe that a single set of global accounting principles must be created in order to have better clarity, comparability and communication between one capital market and another, and between each company and its stakeholders regardless of their respective locations.

Hand in hand with this often comes the regulatory ideal: this single set of rules should be easier to enforce across the globe rather than having the many sets of rules companies need to comply with today. This financial reporting utopia is easy to outline in a thumbnail sketch of what is desirable. However there are considerable political hurdles for both government and business that need to be addressed before this becomes a reality.

Despite these difficulties, calls continue for the adoption of a single worldwide capital markets reporting framework – one framework of accounting, and one standard of corporate governance, audit performance, and market regulation across the world. Implementing this objective will be a major challenge and opportunity not only for the accounting profession, but also for the actuarial profession, particularly on issues involving risk and its measurement and effect on the current and future value of contingent assets and claims.

The challenges of tomorrow's corporate reporting are even greater than the need to harmonise today's world accounting. The traditional financial reporting system, developed in the age of manufacturing, needs to be brought into the digital age. Despite increasingly tight regulation and extensive disclosure requirements, even the best of traditional financial reporting, which is anchored in 'what has happened in the past' was failing to keep up with all the needs of investors who are increasingly concerned with 'what will change and how will that affect the future'. This leads to the possibilities that in the future companies may be the subject of continuous (or at least more frequent) auditing, consistent with 'continuous disclosure' requirements of capital markets and be required to introduce 'value oriented reporting' which emphasises the future rather than the past and highlights non-financial as well as financial performance measures. The 'value at risk' reporting methodology now used in many banks and reported annually in notes to their accounts is but one example of this trend.

In Australia, sentiments regarding the accounting standards harmonisation programme were positive when the issue was first promulgated as one needing urgent attention back in 1995. The pace of change has since sped up and the Australian Accounting Standards Board has been relentless in producing material since its harmonisation pilgrimage began in 1996. The International Accounting Standards Committee (IASC) has produced a set of accounting standards that will allow multinational companies to do business according to the same rules, which should make cross-border equity and debt issues more consistent. These standards, and their continued development have been recently endorsed (at a meeting held in May 2000 in Sydney, Australia) by the International Organisation of Securities Commissions (IOSCO). This marks a significant step forward for the global economy.

Despite increasingly tight regulation and extensive disclosure requirements, even the best of traditional financial reporting, which is anchored in 'what has happened in the past' was failing to keep up with all the needs of investors who are increasingly concerned with 'what will change and how will that affect the future'.

These new accounting standards also underline the fact that Australian companies are facing a new round of pressure to integrate with the world economy and to remain attractive investments in a global market if they are to keep their cost of capital competitive. The IOSCO endorsement will see the IASC standards increasingly used as a template for access to capital markets, in particular the USA. Further background on the various international regulatory bodies likely to be influential on the work of actuaries in the future is set out in Appendix 1.

A global regulator might appear to be the ultimate future answer to the emergence of global companies using increasing global securities markets. But that would require a much greater pooling of sovereignty and greater commonality of legal systems than is currently evident or planned. A similar set of driving forces is also producing similar developments in relation to the prudential regulation of financial institutions. A practical approach based on increased collaboration between national regulators is being used to implement these developments leading to the creation and/or increasing influence of bodies such as IASC, IOSCO, Bank of International Settlements (BIS), International Association of Insurance Supervisors (IAIS) and the International Actuarial Association (IAA).

1.4 The Recognition of 'Irrational' Behaviour in Economic Decision Making

Our understanding of economic behaviour and risk has developed considerably since the beginnings of the actuarial profession in the mid 1800s. Today, actuaries often think of themselves as experts in risk and generally look at numbers rationally and expect others to do the same. But actuaries, in particular, need to be aware of the importance of irrational behaviour.

The golden age of rational economics began in the late 1940s. The dominance of rationality went hand-in-glove with the growing use in economics of mathematics, which was also easier to apply if people were assumed to be rational. Rational behaviour was assumed to involve people maximising utility. People's belief

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systems were believed to be based on logical, objective analysis of the available evidence.

Economic rationality became the basis of macroeconomic policy. Sharemarkets fell under the spell of 'efficient markets theory' and the Capital Assets Pricing Model that assumed that the price of financial assets such as shares and bonds are rationally based on all available information.

The dangers of risk management began to emerge in the 1980s. During the 1980s macroeconomic policies based on rational expectations failed to live up to their promises and the stock market crash of 1987 shattered the confidence of many in the efficient markets hypothesis.

The door opened to a growing school of behavioural economists who challenged the idea that people mostly act rationally. New thinking about risk takes into account behavioural issues. Some of the key observations made by psychologists include:

- People appear to be disproportionately influenced by the fear of feeling regret.
- People are prone to cognitive dissonance: holding a belief plainly at odds with evidence, usually because the belief has been held and cherished for a long time.
- Anchoring: people are overly influenced by outside suggestion, even when they know that the suggestion is not being made by someone who is better informed.
- People suffer from status quo bias: they are willing to take bigger gambles to maintain the status quo than they would be to acquire it in the first place.
- People tend to compartmentalise, often on superficial grounds. They then make choices about things in one particular mental compartment without taking account of the implications for things in the other compartments.
- People are consistently and irrationally overconfident.
- People tend to treat events as representative of some well-known class or pattern – they 'see' patterns in data even when there is none (representativeness heuristic).
- People focus excessively on a particular fact or event, rather than the big picture, simply because it is more visible or fresher in their mind (availability heuristic).
- Magical thinking: attributing to one's own actions something that had nothing to do with them, and thus assuming that one has greater influence over events than is actually the case.
- People have hindsight bias, memory bias and are often emotional.

The psychological idea that has had the greatest impact on economics is prospect theory, developed by Daniel Kahneman and the late Amos Tversky. It is based on the results of hundreds of experiments in which people have been asked to choose between pairs of gambles. These experiments have demonstrated convincingly that most people feel much more pain from losing, say $100, than the pleasure they feel from winning $100. But it is also wrong to assume that most people are simply risk averse. They are risk averse towards possible gains, but risk seeking when it comes to trying to avoid losses. This means that people prefer a smaller certain gain to a larger uncertain gain. They prefer a larger uncertain loss to a smaller certain loss.

One of the implications of this is 'status quo bias'. People prefer to hang on to what they've got and, in fact, are willing to pay more to keep something already in their possession than they are to acquire the same item had they not already owned it. Our status quo bias can have an influence on the way we handle our investments – people are more inclined to stick with any investment that can be seen as the status quo.

Those suffering from loss aversion do not measure risk consistently. They take fewer risks that might result in suffering losses than if they were acting as rational utility maximisers. For example, most people would be prepared to pay $1 to buy a lottery ticket that gives them a 1 in 100 chance to win $100, because their risk of loss at $1 is small. But far fewer people will be prepared to pay $1,000 to have the

same 1 in 100 chance to win $100,000 because although the odds are identical, the risk of loss of $1,000 is very different to the risk of loss of $1.

Prospect theory also claims that people regularly miscalculate probabilities: they assume that outcomes which are very probable are less likely than they really are, that outcomes which are quite unlikely are more likely than they are, and that extremely improbable, but still possible, outcomes have no chance at all of happening. They also tend to view decisions in isolation rather than as part of the big picture. There are many real world examples of how this theory can explain people's decisions.

Behavioural theory has given us new insights on risk. Conventional economists talk about people being risk seekers or risk averse. They assume that most people are risk averse. But over the past 20 years, psychologists and 'behavioural economists' have amassed a large body of evidence showing that most people aren't risk averse, they are loss averse – which is a very different thing.

These quirks in human nature have powerful implications for the marketing of various products and particularly those designed to help people reduce the risk of loss. A home insurance policy, for instance, offers a certain loss – the price of the annual premium – in return for avoiding the loss you'd suffer in the highly uncertain event of your house burning down or being burgled. One of the central findings of behavioural economists is that people react differently to logically identical choices depending on how they are 'framed' – how they are packaged. Given that people are risk averse towards gains and are biased towards hanging on to what they've got, the better way to sell insurance is to portray it not as a way to avoid loss, but as a way to ensure you keep what you've got.

Similar concepts are now pervading the business of investment where one can observe investors who do not act rationally (in the classical sense) but rather act in a manner that is relatively insensitive to the price of a security to maintain liquidity. This was clearly illustrated by Michael Barker, a Fellow of IAAust in his address entitled 'Adding Value in the 21st Century' presented at the IAAust Fastforward 2010 – The Future of Funds Management Forum in March 2000 who postulated two kinds of investors:

The portfolio investor who operates by seeking value, switching between investments in a price sensitive manner in an attempt to maximise overall return, and

The liquidity investor who invests (or disinvests) without any sensitivity to the price of the assets being purchased or sold.

Examples of liquidity investors include index fund managers, superannuation funds that invest contributions according to fixed strategic asset allocation ratios, or the rebalancing of investments by institutions to meet pre-ordained balance sheet ratios.

In the past it has been reasonable to assume that portfolio investors dominate within each market, and that only a moderate percentage of portfolio investors is required to keep markets efficient. But it can be argued that the proportion of liquidity investors in markets is generally increasing as factors driving such investors become more prevalent and only a moderate percentage of liquidity investors are needed to cause market behaviour that is far from efficient. In such an environment, the returns oriented decisions of portfolio investors are being swamped by liquidity flows. The consequent destruction of the basic tenets of portfolio theory renders invalid the assumptions on which most modern finance applications and modelling of investment returns are based. The proportion of price-insensitive liquidity investors in the market reaches the stage where momentum feeds upon itself and the pattern of returns is nothing like the normal statistical distribution assumed in portfolio theory so that conventional risk models are less and less appropriate.

Those managing money need to recognise the impact of both liquidity risk and liquidity investors on market efficiency and incorporate appropriate risk management techniques into their processes. Product managers and those advising and managing the expectations of investors should also recognise the systemic implications of the recommendations they are making collectively as a group, and modify their modelling techniques accordingly.

The growing field of behavioural finance theory illustrates how behavioural issues affect the management of investments. This body of knowledge reveals that there is more to investing than any simple risk and return trade-off. A number of studies have constructed examples showing how investors do not always act in a rational manner when confronted by investment decisions.

On the one hand, the fear of regret and loss aversion increases the concern that investors have about 'losing money'. For trustees of superannuation funds and their investment consultants, their accountability to others

can heighten such concerns. This can lead to comfort seeking decisions, such as strong association with peer groups, a reluctance to make changes, a tendency to over-diversify the investment management structure, and an emphasis on large, well-known investment managers.

At the other extreme, over-confidence, over-simplification and extrapolation of past trends can lead to unrealistic expectations and a mis-estimation of risks. Framing and mental accounting encourage inappropriate comparisons and obscure the big picture.

Rational behaviour is more predictable than irrational behaviour. This is why irrational behaviour is often omitted from models, which instead assume that participants act in a rational manner.

These omitted behavioural elements, as Amos Tversky (1995) points out: 'indicate that the rational economic model that informs much of financial analysis is incomplete in some essential respects, and the departures are systematic and not random'. In the construction of better investment management structures, these potential traps and biases need to be carefully considered and skillfully avoided.

In the last two decades an unprecedented amount of intellectual firepower has been directed at the subject of risk, particularly in the field of finance. But risk remains elusive. If we rely too heavily on clever models we run the risk of succumbing to an updated version of the faith that our ancestors placed in oracles and soothsayers. Care is required to ensure that the 'science' of risk management does not itself become a dangerous illusion that hides potentially catastrophic risks.

1.5 Sustainability and the Environment

Community concern for the environment is booming. To cite one spectacular example, Clean Up Australia has been a remarkable global story since its inception in 1989. The latest clean-up, in March, attracted 680,000 volunteers. The green movement generally is thriving in Australia. The Australian Conservation Foundation currently has more than 60,000 members, the highest membership it's ever had. Communities and leading business organisations have long been concerned about the negative impact of human activity on the environment. This manifests itself at the micro-level, for example with urban pollution and road congestion, and at the macro level with issues such as salinity, land degradation and climate change.

The pressure for sustainable development has already lead to substantial improvement in environmental performance. But population pressure and economic growth mean that the absolute impact of human activity on the environment continues to increase dramatically. Many will argue, along with NSW Premier Bob Carr in an article in the Sydney Morning Herald, that we are now well past the point where global commons of land, air and water can absorb the impact of human activity without irreversible damage. The climate change debate is the first real attempt to address these problems at the global level.

Some innovative organisations are recognising greater opportunities for improved environmental performance. They are making changes that are economically viable in their own right. But for such changes to be effective, they will have to account for environmental externalities. The full environmental impact will have to be quantified and costed in investment decisions. This is a necessary solution to our environmental problems, and is the key to community acceptance and corporate credibility.

Climate change and the increasing international action arising from the 1997 Kyoto protocol whereby a price will be set for the right to emit greenhouse gas into the atmosphere - where this right was previously free - is but one example of major changes to corporate activity that will be triggered by environmental issues.

Many companies have concluded that they will pay a high price for disregarding the environmental and social implications of corporate decisions and for endorsing a short-run view of corporate self-interest. Leading organisations are becoming increasingly committed to measuring their performance against environmental and social parameters as well as financial ones. This requires a corporate citizenship mindset in which managers make decisions, design systems, and initiate programmes that reflect a commitment to ethical principles and encourage community-wide integration. But the adoption of such an approach raises questions as to how to quantify and assess environmental and social performance and balance it against financial imperatives?

Companies can become well regarded because they increasingly recognise the importance of addressing the interests of all groups affected by a company's actions, decisions, policies, and practices. Since those interests are often incompatible and costly in the short term, these companies obviously take a long term view of profitability. They recognise that the divergent points of views of employees, customers, investors, and local communities can and should be accommodated in the long

term. There is even emerging evidence that companies run on a 'sustainable' basis provide better shareholder returns.

At the 1992 Earth Summit held in Rio de Janiro 180 nations committed themselves to policies that would enable them to develop their economies while preserving the environment and the renewable natural resources on which future prosperity depends – what they called 'sustainable development'. They also assembled a broad blueprint for arresting environmental degradation. Subsequently, the United Nations constituted a 53-nation Commission on Sustainable Development to translate the Rio accords into action. Part of this involves reducing emissions of heat trapping greenhouse gases like carbon dioxide and further stimulating companies to enact environmental programmes.

Many companies have concluded that they will pay a high price for disregarding the environmental and social implications of corporate decisions and for endorsing a short-run view of corporate self-interest. Leading organisations are becoming increasingly committed to measuring their performance against environmental and social parameters as well as financial ones.

In Australia, this issue is in focus at present because Government figures for 1998 show that Australia dramatically overshot its greenhouse gas targets, just one year after the 1997 Kyoto climate-change summit, at which it promised to curb their growth. At Kyoto, all developed countries except Australia agreed to reduce their emissions of greenhouse gases: carbon dioxide, methane, nitrous oxide and the various fluorocarbons. Australia was able to argue for an increase in emissions similar to that of most Third World countries. By the control date of 2010 it was expected to contain its emissions to no more than 8% more than its 1990 levels.

While European countries such as Britain and Germany are expected, and expect, to produce 20% less than 1990 by 2010, the figures from the Australian Greenhouse Office (AGO) show that by 1998 we were already producing more than double the amount of greenhouse gases we had been allowed at Kyoto, in a special dispensation, to grow to by 2010.

The two biggest gas-producing sectors to expand in the period were stationary energy (mainly electricity generation) and transport. Some analysts attribute the energy growth as being largely due to the national deregulation of the electricity market. Competition between former Victorian State Electricity Commission generators, privatised by the Kennett Government, has had national ramifications with the ability of producers to sell their power to a national grid that dispenses with the old State boundaries. Victoria's brown coal stations of the Latrobe Valley are now the nation's cheapest, but they are also the dirtiest and by far the biggest producers of carbon dioxide.

The cheapness of power has proved an incentive to increase its use, to the benefit of our economy generally but to the cost of our greenhouse emissions. In 1990 the AGO's figures show that Australia's electricity industry poured out 54.8 million tonnes of carbon dioxide. Eight years later this figure had increased to 67.4 million tonnes.

Although opinion polls show there is a public concern about greenhouse, there is also a great deal of ignorance about its perceived cause. A recent NSW study showed the bulk of people questioned thought at least 50% of Australia's electricity came from renewable sources such as hydro or solar power. In reality hydro accounts for between 5% and 10%, and solar about 0.2%.

Transport, particularly the growth of the road freight industry at the expense of rail, is another factor in increased greenhouse gas emissions. Trucks that stream down our highways provide employment, speed and convenience to industry, but they also account for an estimated 14.2% of national emissions, a growth of 2.8% during 1998 alone. Cars by contrast contribute 9%.

Voluntary environmental reporting (as opposed to mandatory environmental reporting, such as required by s299(l)(f) of the Corporations Law or the National Pollutant Inventory) is not new in Australia. Companies including BHP, North, Orica and WMC have published Environment Reports for several years now, whilst newcomers include Alcoa, Pasminco and Thiess. In the public sector, Sydney Water and Melbourne Water publish Environment Reports. However, generally, Australia lags behind the best practice of many overseas countries.

A 1999 international survey revealed that only 15% of the top 100 Australian companies published an Environment (or Health, Safety and Environment) Report – far behind countries such as Germany (36%), Sweden (34%) and the UK (32%). Of the eleven countries surveyed, only France (4%) lagged behind Australia.

However, the trend is clearly upwards since three years earlier only 5% of Australia's top 100 companies published an Environment Report. This aligns with international experience, which shows that voluntary environmental reporting is growing strongly in all eleven countries except the USA, where fear of litigation for

companies that 'come clean' may be discouraging anything other than mandatory disclosures.

So what is voluntary environmental reporting exactly? Environment Australia recently published A Framework for Public Environmental Reporting – an Australian Approach, that includes a list of suggested contents:

- organisational context: the organisation's profile, environmental impacts and policy;
- management performance and systems: information about environmental management systems and legal and other compliance;
- stakeholder engagement activities (an indication of how much an organisation listens to its stakeholders);
- environmental performance, including data about waste and emissions to air, land and water (cost-saving opportunities);
- product or service performance, such as packaging and 'cradle to grave' product responsibility; and
- verification statement (a long way from being an audit report and many environment reports currently omit them).

But what is driving organisations to publish environmental reports? There are many reasons but three important ones include:

- Risk Management – The environment is a key area of financial, legal and reputational risk for many organisations. The Australian Minerals Industry Code for Environment Management specifically requires signatories to publish environment reports, partly so that mining companies retain the support of the communities in which they operate or, in the jargon, retain their 'licence to operate'.
- 'What Gets Reported Gets Done' – Reporting on environmental performance makes its impact difficult to ignore, especially as fines for a company and imprisonment for its directors can result. Also, the idea of business is to add value, not to add waste. Highlighting resource usage, waste and emissions generation is effectively highlighting cost-saving opportunities.
- Staff Productivity and Quality – There is no doubt that people want to work for organisations that share their ethics and values. Organisations demonstrating and communicating environmental responsibility are likely to be able to recruit better people (an important source of business success) and are likely to have a more contented and productive workforce.

Environmental management and reporting is not just a public relations exercise with a vague 'feel-good' factor to it, nor is it a sop to environmentalists. It has commercial benefits.

There is also a growing body of opinion that good environmental management is a sign of a generally well-managed company. This is evidenced by the development of the Dow Jones Sustainability Group Index, which measures the stockmarket performance of leading environmentally and socially responsible companies, outperforming other 'ordinary' indices.

This demonstrates that environmental management and reporting is not just a public relations exercise with a vague 'feel-good' factor to it, nor is it a sop to environmentalists. It has commercial benefits. In a world becoming increasingly concerned about global warming, soil salinity, land degradation and water quality, environmental management and reporting will increase in importance.

1.6 Increasing Individualism

Just as the economics of information distribution have shifted the value of physical assets they have also changed the economics of and desirability for organisations maintaining certain knowledge sets and people skills in-house. Teams can be assembled quickly and efficiently to do any kind of task and non-core tasks can be outsourced more effectively to specialists.

As tertiary industries come to increasingly predominate the value added sectors of developed economies, our society is also becoming wealthier, better informed, better educated and better connected. As consumers, as employees, as citizens, and as business or social entrepreneurs, these trends have led to people becoming agents of change themselves, enjoying a new freedom of choice and risk.

This has led to major change in community attitudes to work and employment. The smart and savvy know that there is little value in the traditional promises given by large organisations of good incomes for life and

superannuation or pensions at the end. There is a rising mentality of free agency and the need to manage your own life. There are several reasons for this attitude:

- traditional employer promises fail to compete with the 'chance of a lifetime' perhaps only available for a short time while a market position is established in a new business;
- employees know that given the scale and speed of change, the people who make promises may well not be around to fulfil them;
- good people are conscious of developing their skills at the cutting edge rather than in larger organisations where their talent is likely to be under-utilised.

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At the same time organisations have been under pressure to improve performance by shifting risks from themselves to their employees and customers. Individuals have had to become more self-reliant and independent. Coinciding with this trend we have, over recent years witnessed the extensive commercialisation and privatisation of government business enterprises and correspondingly higher levels of share ownership. Pressure on government budgets has led to tougher tests needing to be met by those seeking to become eligible for social welfare payments and outcome driven policy is also being applied increasingly to social welfare services. The common factor in all these trends is a necessity for individuals in our society to cope with higher levels of risk and uncertainty.

In general there has been an increasing focus on the short term rather than the long term and on the 15 second 'media grab' to give an impression of an issue ('how will this affect me?') rather than a detailed report or analysis ('how will this affect others?'). Notably, the leading Australian national television broadcaster now advertises widely that more people in Australia rely on their broadcasts than on any other source to receive news.

The Economist magazine recently reported that '100% turnover industries' – those in which the typical company loses the equivalent of all its employees in one year – now account for nearly a quarter of America's entire workforce. These industries include retailing, food services, call centres, elderly care nursing and car sales. As one might expect, many of these high turnover jobs are part-time, poorly paid, boring or otherwise unattractive. But the issue is more widespread. Despite rising salaries and the liberal use of retention tools such as stock options, employee defections in high-tech industries in the USA have reached epidemic proportions with the average technology professional staying on the job for just 13 months according to one recent survey. Statistics published by the US Department of Labour show that in the period 1983 to 1998 average tenure in jobs in the USA reduced as set out in the table below.

Age Group	Average Tenure in Job in USA (in years)	
	1983	**1998**
20 – 24	1.5	1.0
25 – 34	3.0	2.5
35 – 44	5.5	5.0
45 – 54	9.5	8.0
55 – 64	12.2	10.0

The implications are that there will be more part time jobs, a more flexible workforce, more focus on short term concerns, less security and more uncertainty. The long term is simply less relevant.

This new culture of self-reliance and independence has been described by some commentators as the 'death of mateship'- invoking a uniquely Australian cultural symbol. However there is no doubt that increasing urbanisation and the rise of a new generation with a more entrepreneurial and individualistic approach to their work and careers are creating seismic changes in our society. This group, which is not merely confined to the young, is likely to be either self employed or, if employed, knows when they plan to get out, where they are going and how much they'll earn. They are likely to know how much they are worth, be Internet and investment savvy and manage their own DIY superannuation fund. The common attitudes and aspirations of

this new group will have a profound influence on our society. Managers are less focused on a career within a company, particularly if it is a large organisation – they are looking outside for their futures. Service industries are dominated by owner-operated concerns, small teams, fluid working operations and personal capital – all the marks of entrepreneurs. Many of these are owned by women, who, dissatisfied with institutional life, have been starting small businesses at a faster rate than men and now represent 1/3rd of all small business owners.

The statistics are in and the trend is clear. Increasingly, our outlook is dominated by concern for self and immediate family and more of us live alone than ever before. One in four Australian households is now one person living alone, up from one in five just a decade ago. We don't have as much religious faith as we used to. And we are less likely to sign up with community service organisations. In the past decade, membership of Lions clubs around Australia has dropped from a peak of 35,000 in the 1980s to 28,500 last year. The Salvation Army's soldiers have dropped from 13,863 ten years ago to 11,094 in 1999. Rotary International has fewer members now (38,123) than it had ten years ago (39,619). Civic engagement and social connectedness have diminished almost equally for both women and men, working or not, married or single, financially stressed or financially comfortable. We are spending more time in front of television sets or computer screens, more time in cars, and less time sharing public transport. (The number of motor vehicles per head grew by 12% in the past decade alone.)

Politically, we are moving towards much higher levels of fluidity and flux. Twenty years ago, political party identification was very strong, about 90%. Now it is down to about half that. It is likely that this will lead to much looser political affiliations and groupings. The old political party system worked to aggregate various interest groups. But, with the new pluralism in Australia, we are now seeing the dis-aggregation of interest groups. This is leading to trends that are anti-big party, anti-organisations, anti-bureaucracy, anti-red tape, anti-organised labour and more single issue focused, more independent and often a more narrow-minded view of the world. The impact on our political culture of any particular group will come to depend on whether its followers recognise themselves as a group. Where they recognise themselves as a class or group with a common interest, they will have the potential to become a potent political force.

Television and Internet chat rooms can make people 'feel' intimate, informed, busy, and involved in a kind of remote-control engagement with their community without the effort of actually being engaged. The Internet revolution is creating new communities of common interest, so the whole concept of communalism may be in the process of re-invention.

In education, parents are more involved in school decisions. People are more likely to look at education as an investment that they want a return from. The student as customer, parent as investor paradigm has also permeated universities. There is an expectation of a fee for service and expectations of that service are correspondingly higher. The switch from public education to private education has mirrored the switch from public services to private services generally and indeed the flow from government to private employment.

In 'Bowling Alone - The Collapse and Revival of American Community' Professor Robert Putnam of Harvard University, provides a wealth of detail about the rise of individualism in the USA at the expense of community. Most of the American trends he identifies are being mirrored in Australia, but a number are not yet quantified, such as:

- families don't spend as much time at the meal table together as they once did;
- collectively, the enjoyment of work has declined; and
- young people are far less trusting than older generations. In polls where people are asked if they agree with the statement that 'most people are honest', the lowest rate of agreement, by far, is among people born after 1960. Across all age groups, the social trust trend has been slowing down during the past decade.

In Australia and the USA, loss of trust mirrors a loss of safety. Employment of police and security personnel has surged in both societies. In the USA, employment of security personnel has doubled, per capita, since 1960, after remaining stable for the previous 60 years. The number of lawyers in America has doubled, per capita, since 1960 and has also surged in Australia. This seems somewhat ominous because the legal profession tends to use enforceability to make up for a decline in fellow-feeling in society.

So what is driving higher levels of social disengagement? Above all, technology. Especially the television set and the computer screen. TV and the Internet have not merely eroded direct community activity but have created what some psychologists see as a false sense of companionship. Television and Internet chat rooms can make people 'feel' intimate, informed, busy, and involved in a kind of remote-control engagement with their community without the effort of actually being engaged. The

Internet revolution is creating new communities of common interest, so the whole concept of communalism may be in the process of re-invention.

1.7 Falling Fertility, Longer Lives and an Ageing Population

Ageing of the world's population is one of the key challenges facing social policy makers, businesses and individuals. Major adjustments will need to be made in our society to accommodate the dramatic shifts in demography now occurring to formulate effective policies and programmes on ageing.

Population projections require assumptions about fertility, mortality and migration. This subject was addressed in detail, in respect of the Australian population, in a paper written in October 1999 by Craig Thorburn, a Fellow of IAAust. An abstract of the key issues addressed in that paper and its conclusions are set out below so as to provide a better understanding of this issue in an Australian context.

Fertility

Fertility, in Australia like most other countries, has been falling for a considerable period but it remains unclear the extent to which the fall will continue. The popular interest in Australian fertility levels, trends and characteristics probably reflect the fact that many of us have contributed to statistics (even if only by our own birth) and can relate to the nature of our collective humanity in the statistics of reproduction.

The greatest number of births reported in one year in Australia was 276,361 in 1971. Reported Births show a decline and recovery since 1971 but has been in further decline throughout the 1990s. These variations reflect the changes in the population of child bearing age as well as the rates of fertility. In contrast to birth numbers, age adjusted fertility peak in 1961 (3,548 per 1,000) at a higher level than the subsequent smaller peak in 1971 where the total birth numbers also peaked.

For the last two decades the Total Fertility Rate (TFR) has been relatively stable (with a downward trend) below the rate required for the long term maintenance of the size of the population by fertility alone (2,000 per 1,000). If fertility remains below replacement level then the eventual effect will be that Australia will be dependent on migration to maintain population growth or to face an eventual decline in population numbers.

Recent trends in the TFR are generally attributed to:

- increased access to oral contraceptives in the 1960s;
- increased labour force and education participation among women from the 1970s to date; and
- sharp reductions in the propensity for women to have three or more children (reduced family size).

The introduction of oral contraception and increased labour force participation has seen a trend toward more deliberate decisions being made about the timing and size of families.

Current total fertility levels also reflect growing proportions of ex-nuptial births and falling marriage rates as shown below.

Year	1977	1987	1997
Ex-nuptial births	10.3%	18.0%	28.2%
Crude marriage rates	8.1	7.0	5.8

The introduction of oral contraception and increased labour force participation has seen a trend toward more deliberate decisions being made about the timing and size of families.

Initially, reducing family sizes which had been a trend throughout the century, simply became a greater assured reality. Planned timing allowed earlier completion of fertility, often before the mother was aged 30. In 1975, the National Population Inquiry noted that there was an almost universal trend where family size could be limited to two or three children and the youngest child could be at school by the time the mother was 35 leaving a substantial time ahead for uninterrupted employment. This observation points to the relevance of the employment and economic opportunity in fertility decisions but highlights a push to earlier completion in the 1970s.

In contrast, the same economic factors at work today have driven a different response with similarly planned family sizes but accompanied by later rather than early family completion. This could be attributed to the relative advantages now available to women in employment earlier in their working lives. This trend has been coincident with increased participation in tertiary education by women. Completed and expected family size is also reducing. It is now rare to find families of three children or couples who plan to have more than two children. Coupled with the means available to make this expectation a reality, this suggests continuing falling fertility rates. Age specific fertility rates confirm the recent tendency to later child bearing in Australia. Various other statistics support this same observation. Both the median age of mothers at childbirth and the median age of mothers at their first confinement have been persistently increasing since the mid 1970s.

Whilst social factors contribute to varying fertility rates in different countries, it is sanguine to note that the TFR in capital cities in Australia is already at 1,600 per 1,000 (that is, only 80% of the replacement rate). This suggests that the most significant issue for fertility and the potential for trends in the future is the deeply institutionalised social and economic forces that are leading us toward continued falling fertility rather than any anticipation of a turnaround in this trend in the foreseeable future.

Mortality

The current Australian Life Table 1995-97 (ALT 1995-97) records life expectancy from birth in Australia at 75.7 years for males and 81.4 years for females. A rigorous analysis of mortality trends is not appropriate for the purposes of this address, but the following points should be noted.

For much of the early part of the century and for the last 25 years, rates of improvement in mortality have been relatively stable but at sharply different levels. Rates of improvement have also varied with age as the factors influencing improvement have a variable effect. In particular, improvements more recently in the treatment of cardiovascular diseases has the greatest impact on the age groups most susceptible to these diseases.

Whilst the current levels of mortality for Australia can be determined readily, expected future mortality is more difficult. It would seem conservative to assume that the experience over the last century will persist given that the greater rates of improvement seen in the last 25 years have been reliable in their continuation. Nevertheless, it is certain that future improvement at higher rates relies on continuing success in combating those illnesses that currently affect Australians. This seems quite likely given the developments in genetic engineering discussed earlier and may even prove to be conservative.

In projecting future population, there seem to be two sets of mortality improvement rates immediately available for use as assumptions. The improvement rates seen over the last century might be considered appropriate for the long term or conservative. Similarly, the rates for the last 25 years might be considered aggressive.

The easiest summary numbers to illustrate the effects on mortality rates is the expectation of life. If we consider the possible 'Life Table' life expectancy at birth then the various assumptions yield results as shown in the following table.

	Male		Female	
Improvement	**25 Year**	**Century**	**25 Year**	**Century**
Year	**Life Expectancy**			
ALT (1995-97)	75.6	75.6	81.3	81.3
2010	79.0	77.2	84.3	83.0
2025	82.2	78.8	86.9	84.6
2050	86.4	81.0	90.5	86.8
2075	89.7	83.0	93.1	88.7
2100	92.3	84.8	95.1	90.3

Of some interest, particularly for those with an eye on retirement plans, the expected (average) age of death considering current age is instructive. For example, the life expectancy for girls born today on this basis ranges between 87 and 92 years depending on the expectations of future improvements.

Continued high levels of mortality improvement would seem in particular to rest on continued scientific advancement at present rates. As a result, it seems reasonable to consider an 'optimistic' assumption of the continuation of the last 25 years of improvement.

Almost all Australians can be considered to be migrants or descendants of migrants. As a result, Australia is a nation that is today substantively a construct of past migration and the associated social, economic and cultural structures that result.

Migration

The third part of any demographic projection is not the subject of natural events. Migration is influenced by many factors and, in different countries, government policies have a varying role in the control of levels and the form of migration across national borders.

Debates on this subject usually emerge against a backdrop of a wider concern on some underlying issues (in particular, social cohesion, employment, or the environment). Public debate can be characterised as involving a series of plausible assertions which are, however, often selective and unsubstantiated.

Some commentators have focussed on migration as a solution to the ageing of the population. This is, perhaps, because the alternative solutions (higher mortality or higher fertility) are more unsatisfactory or difficult to develop.

One of the reasons that migration is such a passionate subject is the fact that around 22% of Australia's current residents were not born in Australia. This reflects decades of immigration and settlement. Almost all Australians can be considered to be migrants or descendants of migrants. As a result, Australia is a nation that is today substantively a construct of past migration and the associated social, economic and cultural structures that result.

Using the assumptions for future fertility, mortality and migration set out below, the implications for Australia's projected population can be readily examined.

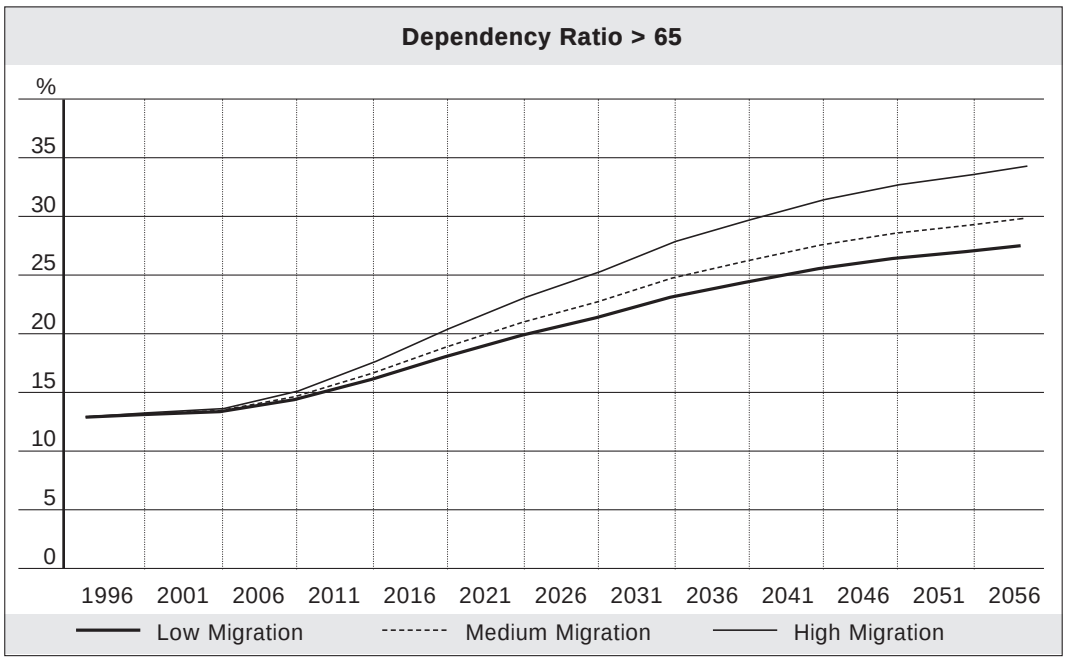
Fertility	A fertility model consistent with recent trends but subject to a minimum TFR of 1.60.
Mortality	ALT (1995-97) with allowance for mortality improvement consistent with the last 25 years.
Migration	Option 1 = 150,000 per annum (high) Option 2 = 80,000 per annum (medium) Option 3 = nil (low)
Opening Population	December 1997 estimated resident population as published by the ABS Cat No 3201.1 (1999).

The results for total population and the dependency ratio (those aged over 65 as a proportion of the whole population) are reproduced below using the three variable migration estimates.

The dependency ratio continues to grow on all assumption sets. This highlights the limited effect of migration on our ageing population.

Migration Scenario	High	Medium	Low
Population (millions)	35.6	25.8	20.7
Year Reached	After 2100	2079	2030

For the workforce, current migration levels suggest a relatively stable expectation. However, low migration would lead to a contracting workforce age group in the near future. Such an outcome would challenge the definition of retirement ages which could be envisaged as being good for some but poor for others. There would certainly be some social readjustment involved.



A falling workforce and a growing group who are reliant on (dis)saving for consumption raises other issues worth noting. Australia's age profile is, as would be expected, not aligned with its neighbours. It is in part for this reason that the OECD considers that the structures to allow international movements in capital and goods should be reviewed as part of a response to the ageing population policy.

Thorburn also considered the implications of population projections such as those set out above for the national capacity to afford existing pension benefit arrangements. Possible solutions considered for a viable scheme which depended on the demographic imperative outlined above included :

- contributions can be altered to meet the challenge; or
- benefit levels could be constrained to meet the challenge – unilaterally; or
- means test adjustments can be imposed to deliver the requirements; or
- the second pillar (private sector superannuation guarantee) can be arranged so that, interacting with the existing means test, viability is maintained; or (presumably)
- a combination of some or all of these.

Thorburn concluded that :

- the means test for pension eligibility, as it operates in Australia, affords the opportunity to provide for wage index based increases in pension levels without undermining the viability of the age pension scheme even though it is unfunded and operates in an environment where the demographic changes are unfavourable;
- rather than simply restricting age pension access punitively, the measures currently in place associated with encouragement of private sector saving provide a structure which offers the opportunity to meet the demographic challenges ahead maintaining viability and income security in retirement for the population throughout; and
- maintenance of a viable unfunded arrangement in respect to demographic pressures in Australia can be achieved through a balance of responses which include the combined effect of increased asset accumulation and a means test for the age pension. Unilateral reduction of benefits in real terms is not a specific requirement as the means test permits a response which is targeted. In addition, responses designed to alter workforce participation and the size of the workforce such as changing retirement dates and 'part-time retirement' can be used to mitigate the demographic challenge.

The IAAust Committee on Financing the Ageing in a paper prepared on this subject in June 1999 concluded that the possible share of Government annual budgets in Australia, expressed as a Proportion of GDP, represented

Year	2001	2011	2021	2031
% of GDP	6.9	7.9	8.9	10.5

by health care and aged care (excluding the age pension) would increase as set out above from 6.4% in 1996. These increases are significant and could not be sustained without either increased taxes or a reduction in spending in other areas, such as education - which may become possible if fertility continues to decline.

These conclusions demonstrate that population ageing will have an enormous impact on the Australian community raising issues related to the demand for education and work at various ages, the quality of care provided to the elderly, rising health care costs, patterns of inheritance and changing family structures. It will also give rise to the need for new visions in providing the built environment, recreation and leisure across the life course. Commercial businesses will need to review what these demographics will mean to them, both in terms of anticipating changes in underlying demand and in determining their response to the shift in market dynamics and consumer needs.

Part 2 : What Does This Imply for Actuaries and Those They Advise?

The forces at work in our society that will shape the future role of actuaries and the concerns of those they advise can be summarised by observing the intersections where the forces already described meet and interact. The forces likely to have the greatest influence over the next ten years and beyond include 'longevity', 'web connectivity', 'sustainability' and 'individualism'. These changes, already in evidence in our community, will be the forces that shape both the demand and supply for many services. Over the next decade the interaction of these forces will also re-confirm the central importance of trust and transparency, often reflected in a reputation or a brand name, as a key competitive factor for commercial success. This is because the central tenet of the study of 'irrational' human behaviour tells us that human beings are loss averse and are disproportionately influenced by the fear of feeling regret – so they are likely to be more comfortable dealing with someone with a good reputation that they recognise as offering a low risk of loss.

The forces likely to have the greatest influence over the next ten years and beyond include 'longevity', 'web connectivity', 'sustainability' and 'individualism'.

This leads to several propositions of interest to actuaries about the next decade and beyond. Several of these were advanced in a speech given by Graham Bradley, Managing Director of Perpetual Trustees Limited at the IAAust 'Actuary of the Year' presentation function earlier this year. The first is that the health care, superannuation and funds management industries will be alive and well in the year 2010 thanks to the longevity revolution. Compared to 50 years ago, most adults in the first and second world nations, at any rate, now expect to live healthy active lives well into their mid-80s rather than their early 70s. Many of them will live well into their 90s. One noted professor of demography recently produced the attention grabbing statistic that two-thirds of all the human beings who have ever lived in human history to be 65 years or over are still alive today.

The longevity revolution dramatised by that statistic is changing both the patterns of work and life and redefining the notion of retirement. We have, in the 20th century, generally accepted 65 to be the traditional age for retirement from work but people in the next decade and beyond are going to need to have a lifetime saving plan to enable them to live at their desired lifestyle for 30, 40 or even 50 years following retirement at that age from full-time employment. Because retirees will be healthier longer this is likely to lead to changes in the nature of work at this age. When coupled with the rapidity of change in a technological era this will mean that people will have to design lifetime savings and insurance plans for periods of work, non-work, study, retraining and then re-employment over a considerable proportion of their life and many people will, of course, be self employed throughout their entire lives. But what of some more detailed likely developments ? I have set out to suggest a few below.

2.1 Genomics and Health Care

Having just experienced the spectacle of the Sydney Olympics at first hand, it seems easy to predict that by the year 2016 or 2020 a controversy is bound to have erupted over whether athletes who have either been conceived with or benefited from genetic engineering techniques should be allowed to compete on even terms against 'normal' athletes at the Olympics. Such a controversy will be much harder to deal with fairly than the current controversies over the use of drugs in sport! It could even lead to the creation of a third

The emphasis will move in health care from cure to prevention. The availability of cheap genetic screening tests will enable doctors to advise patients on how to avoid or mitigate the conditions that both will know the patient is genetically susceptible to. It will be a doctor's job to tell us in advance what will go wrong with our bodies – not what already has.

major class of athlete - male, female and genetically engineered. At another level, the possibility of creating a new generation of 'genetically enhanced' human beings who possess both high intelligence and above average physical attributes raises a whole new array of potential issues that are well beyond the scope of this address.

In considering the impact of genomics on health care, in broad terms, it is likely that the emphasis will move in health care from cure to prevention. The availability of cheap genetic screening tests will enable doctors to advise patients on how to avoid or mitigate the conditions that both will know the patient is genetically susceptible to. It will be a doctor's job to tell us in advance what will go wrong with our bodies – not what already has. Then, of course, we will want to be fixed up in advance of becoming ill ! This trend will be accentuated by the ready availability of health information on the Internet so that many consumers of health care will be much better educated about their own current and prospective health than at present.

To finance this it is likely that health expenditure will grow but the pattern of costs will change as treatments change in response to new technological developments. For example cancer screening programmes are likely to reduce the incidence of expensive invasive surgery and better targeted rehabilitation spending could reduce the need for expensive care and institutionalisation. On the other hand, the incidence of diseases such as Alzheimer's and dementia, which are often associated with old age, will increase and demand increased expenditures.

2.2 Funds Management and Investment

All of this will dictate strong growth for the funds management industry across all asset classes but particularly in the growth asset classes as individuals look to maximise long term returns. The need for a greater proportion of growth assets in retirement savings coupled with a world-wide trend towards member directed retirement savings will inevitably increase the risk profile of most people's asset accumulation plans and develop demand for products and advice that can mitigate this risk and be delivered cost effectively. At the same time there will be a much wider array of asset choices available for investors including not only the more esoteric forms of investment such as stable securities, perpetual notes, infrastructure bonds, annuities of various kinds, warrants and options, many of which we see today, but also an increasing preponderance for Australians to invest abroad.

Over the last year we have seen in Australia an unprecedented interest by retail investors in investing in international shares and international asset classes generally through managed funds. Australians are actually heeding their financial planner's advice to diversify their asset allocation across national boundaries. As if these developments were not enough, it seems likely that technology will create greater volatility in share prices of traditionally stable companies and industry sectors increasing the risk and complexity involved in selecting growth assets for portfolios. This will be accentuated by lower financial asset trading costs and increasing prevalence of individual shareholders and day traders.

Again, this will drive demand patterns for the funds management industry and at the same time the web connectivity revolution is giving more investors greater access to investment options via the internet. Electronic broking, which has effectively turned investment in direct equities into a commodity and an almost costless exercise in terms of transactions costs for consumers, web-based portfolio planning services and a proliferation of Internet based information about investing is giving investors a greater choice and, of course, adding to the complexity of their options and decisions.

Looking at how investors will navigate through both the complexity and risks of their choices moving forward, two things will stand out. Firstly, they will seek advice and secondly, they will look for trusted reputations and brands. So for actuaries and others, the business of providing professional financial advice should be alive and well in the year 2010. A great deal of that advice, however, will probably be face to face between an adviser and a client and an essential ingredient in the success of that advice will be the relationship of trust and confidence established between the adviser and the client. Purely electronic advice based services will probably struggle, although some innovations including video phones may make this a more viable delivery channel. It is interesting to note in this regard that Charles Schwab, the most successful discount broker in the United States, has increased its physical branch presence by 15 to 20 per cent per year for the last three years and is planning to continue to grow its physical branch network. They have found that savers may well be prepared to commit $10,000, $20,000 or even $30,000 of their investments via an electronic channel but they are reassured by access to real people in real offices around

the country when it comes to investing larger amounts relative to their life savings. In other words, it will be a 'clicks and mortar' strategy that succeeds in the coming era. It's also interesting to observe that a few months ago Charles Schwab, one of the pioneers of Internet-based broking and investing, acquired the largest trust company in the United States, US Trust, which specialises in giving personal financial advice, in order to strengthen its ability to continue to provide person to person quality advice to affluent clients.

'Developing and sustaining powerful and trusted brands will be an essential ingredient of success in financial services strategies of all kinds a decade from now. Investors will gravitate to brands that connote trust, consistency, reliability and independence.' – *Graham Bradley, Managing Director, Perpetual Trustees Limited*

Developing and sustaining powerful and trusted brands will be an essential ingredient of success in financial services strategies of all kinds a decade from now. Investors will gravitate to brands that connote trust, consistency, reliability and independence. New and purely Internet based brands will struggle just as purely Internet based services such as electronic stock broking are now struggling to avoid becoming a commodity and to maintain their competitive edge. Reputation or brand is a subtle, complex and powerful force and it is not just a matter of the size of the promotional spend. It is important that the brand really stands for something. History, physical presence, personal experience, those all important moments of truth, organisational culture and general reputation all combine to create a brand image and awareness. The power of the media, rating agencies, stock analysts, and advisers, must be harnessed positively to create and sustain the reputation of a powerful brand. The totality of a company's actions and its own governance are important in securing and maintaining its successful brand.

So, in summary, successful competitors in the market for financial services in the year 2010 are likely to be those that have built an integrated clicks and mortar business system on the foundation of a powerful brand secured by trust based advice relationships with their customers. Competitors that rely too heavily on purely electronic plays, at the expense of brand and relationship building, will struggle as will competitors that ignore the connectivity revolution.

2.3 Convergence of Insurance, Risk, Finance and Capital Markets

Apart from the likely trends in investment, funds management and advisory markets, what are the expected developments in insurance and financial markets? In recent years, theoretical breakthroughs have enabled financiers to invent and price many new types of securities and computing and telecoms technologies have helped investors to allocate their capital more efficiently. As noted by the Economist magazine in a relevant article late last year, the result has been an explosion of markets, deals and innovation. Over the next decade, it is likely that financial markets will continue to dis-aggregate risk by breaking down financial instruments into their smallest constituents to give powerful insights into the pricing and allocation of even the most complex risks. This promises to re-shape the future of both finance and insurance.

Once financiers can tailor risks with specialised financial instruments, businesses of all kinds will be able to lay off the precise kind of risk they want to, and to just the degree they want to. In the same way, investors will be able to take on precisely the risk that most suits them. The forward and options contracts that are the building blocks of modern financial risk management have already led to the development of formative markets in weather-linked contracts, telecommunications bandwidth and corporate-earnings insurance which are the forerunners of risk markets to come. The spread of these risk management tools will hasten an upheaval among financial institutions, making it easier for risk to be borne by those most able and willing to bear it.

This promises to allow the risks of corporations to be unbundled in new ways. When financiers package business risks as securities of some form or other, they are tinkering with the components of existing securities, such as debt and equity, that today pass aggregated risks to investors. Given the new technology of finance, some of the financial instruments that are taken for granted today may eventually become obsolete. Equity, for example, might be replaced by a series of risk-linked contracts offering specific payouts. Loan agreements might routinely include contingencies that affect the interest rate.

To understand why, consider the situation of a typical business manager. The odds that catastrophe might wipe out the entire business are very small. But there is a bigger chance of some event that may not be readily controllable that might seriously dent profits. Financial markets hate such unexpected events. Securities traders and analysts, who will discount a surprise gain as a one-off, often tend to panic if presented with an unexpected loss. From the firm's perspective, therefore, an unexpected loss may be even worse than it looks. This gives a company an incentive to lay off any risk that is not intrinsic to its core business. This sort of insurance is being sought by companies, but it is also being promoted by sophisticated insurers who

specialise in pricing the tiny odds of very rare events. They can do this effectively because these risks are uncorrelated with normal insured risks. By packaging them, the insurer creates a portfolio that is more attractive for an investor. In other words, these are 'win-win' deals. This broad trend is sometimes known as Alternative Risk Transfer (ART). It involves the convergence of insurance and the capital markets, once almost entirely separate activities.

On its own, ART may well be confined for some time to specialist markets. But there is also a second revolutionary influence at play: technologies that are external to the industry, particularly in telecommunications and computing. As these become more powerful, they enable information and ideas to be communicated across vast numbers of people at very low cost enabling a conventional financial exchange - useful for 'price discovery' (matching buyers and sellers to find the market-clearing price) - to be created for risk bearing financial instruments. This could be globally available on the Internet. Intelligent matching-systems mean that there is almost no cost to finding the best price available at a given time. Moreover, intelligent automated asset managers might seek out the instruments that best fit an investor's desired risk profile.

These technologies enable the financiers to exploit their unbundling skills to the full. Harnessing the Internet, ART providers and other firms will parcel risks into different classes of securities. They may keep some themselves, but mostly they will sell them on to different types of investor. Corporations' insurance programmes will routinely include coverage of non-standard contingencies. Business risks such as strikes, productivity or the failure of oil and gas exploration will in due course be covered as routinely as are property and workers' liability today.

Over the next decade, it is likely that financial markets will continue to dis-aggregate risk by breaking down financial instruments into their smallest constituents to give powerful insights into the pricing and allocation of even the most complex risks. This promises to re-shape the future of both finance and insurance.

Furthermore, firms will strike financial deals with a greater variety of institutions. Large pension funds, for example, have distant time horizons, and so are well-equipped to absorb risks that extend far into the future. These funds might directly sell a derivative contract giving protection against some specified catastrophe – an earthquake, say. If it happens, the insured company has the right to sell new shares to the pension fund at a set price. At present this cushion against misfortune is provided by common equity, hence such contracts would become a partial substitute for equity.

For today's financial intermediaries, all this promises turmoil, as well as innovation. The engineering and pricing techniques needed to operate in the high-margin, sophisticated markets of ART and structured insurance are costly to assemble and maintain. The skills of the best firms a decade from now, above all, will lie in packaging and marketing. Investors will measure their performance not simply in terms of their returns on capital, but also in terms of how risky they are.

If these trends play out, the rewards will go to those who assume the risk of doing badly in bad times. There will be an unprecedented degree of risk-sharing. Far more risks will end up with those investors most willing and best able to hold them. These developments could deliver a new level of efficiency and stability in the global economy. However this vision may not be realised if access to the vast amounts of data needed to achieve a mass market and price risks accurately is denied because of insufficient trust that the data will be held securely and privacy will be protected. There is also the risk that the risk sellers may know more about the risks being sold than the investors who will have to be confident that they are not being sold exposure to risks that are far nastier than they appear. To get a lower price, for example, a risk seller might be tempted to withhold information, or misrepresent the risks involved. There is also the possibility that systemic risks could arise from such developments so that fears of a widespread meltdown might lead regulators to constrain full cross-border financial activity of this kind.

2.4 Environmental Management and Reporting

Environmental reporting is a good example of where, in our changing world, existing skills of actuaries can be adapted to fill a new, growing need. Environmental data is usually uncertain. The value of 10 tonnes of carbon dioxide emissions can be variable. Understanding the nature of the emission, and its source and method of measurement or calculation is important when reporting it (and it has to be said that many environment reports give no indication of the variability inherent in the published data). This means actuaries can work with other disciplines to gain a reasonable understanding of the relevant organisation's environmental impacts.

Report verification is yet another key area of opportunity. The ideal would be to have environment reports audited to the same standard as financial reports, but few if any organisations have yet developed

sufficiently good processes, systems and controls to make this possible. Verification statements varying in scope and quality are currently issued by environmental consultants as well as by some of the 'Big 5' auditing firms. A lot of work still needs to be done in this area (both by the auditing profession and by industry) before professional opinions anywhere approaching the standard of financial audit reports can be issued. However, actuaries could be excluded from environmental reporting work as other professionals adapt their own skills. Environmental consultants already compete strongly, but as the environment increasingly becomes a mainstream business issue, other professional skills will become more relevant in this area.

2.5 Corporate Governance and Risk Management

For the actuarial profession, these visions have a number of implications, particularly as to how risk will increasingly be managed in the future. These developments also have implications for the currently topical subject of best practice corporate governance generally. In a recent interview, Stan Wallis, Chairman of AMP Limited and previously the chairman of the Australian Government's Financial System Inquiry, was quoted as saying, 'Business progress has always been about taking risk and you can never make any big moves forward and eliminate risk by excessive reliance on governance and due process.'

The characteristics pervading the changes occurring in corporate governance and risk management are summarised in the table below.

Risk Management	
How it Was	**How it Will Be**
Abdicated to the Internal Audit Function	Owned by the Board
Ad hoc and reactive	Systematic and proactive
Fragile	Robust
Linear	Dynamic
Annual	Continuous
Qualititive	Quantitative
Compliance driven	Value driven

Today, risk management is a somewhat crowded field, where roles are frequently claimed by various finance and investment professionals, insurance brokers, economists, lawyers and auditors.

For the actuarial profession, the trends highlighted above are encouraging because they play to the quantitative strengths of actuaries. Nevertheless there will be a continuing need to focus on 'high probability and high impact' areas rather than 'low probability and low impact' issues of detail. The focus will be on value adding/stakeholder value issues and performance measurement and monitoring - not just compliance. The actuarial capacity to quantify and measure risk to assess performance, rather than just use qualitative assessments of risks and controls as has often been the case in the past, will become increasingly valuable. Using the combination of quantitative techniques, commercial skills and professional accountability that actuaries bring to this field should enable them to realise the goal of 'turning risk into value'.

'Business progress has always been about taking risk and you can never make any big moves forward and eliminate risk by excessive reliance on governance and due process.'
– Stan Wallis, Chairman, AMP Limited.

Part 3 : How is the Australian Actuarial Profession Changing?

As outlined earlier, the actuarial profession operates in an increasingly dynamic environment. The industries actuaries serve and emerging areas of opportunity are being reshaped by major forces of change – such as technology developments, the ageing of the population, globalisation, industry convergence, legislative development, privatisation and prudential regulation.

Where once the actuarial profession could be mostly identified with life insurance and superannuation, there are no longer identifiable boundaries to the applications of actuarial skills. This is borne out by the increasing demand for actuaries in general insurance, health financing, banking, investment, funds management, infrastructure funding, telecommunications, power markets, environmental industries, and management consulting.

These developments have led to changes in the international recognition of actuarial qualifications, to growth in the size of the profession and to changes at the IAAust itself. Each of these is discussed in greater detail below.

3.1 International Mutual Recognition Achieved

The development of mutual recognition agreements, signed with the Society of Actuaries (SoA) in the USA and the Canadian Institute of Actuaries (CIA) in May 2000 marked a major step forward for Australian actuaries in meeting the challenges of globalisation. These agreements added to existing arrangements which provided for a qualified Fellow of the IAAust (FIAA) to be recognised by the Institute of Actuaries and the Faculty of Actuaries in the United Kingdom, which, in turn provided recognition for the FIAA qualification in the European Union.

The Society of Actuaries will now waive its examinations and admit to Fellowship an FIAA in good standing provided the FIAA was obtained by examination, the candidate is a Member of the Academy of Actuaries(MAAA) or an FCIA and has passed the SoA Fellowship Admissions Course (two – three days) or equivalent in the last five years and has satisfied SoA Professional Development requirements.

Where once the actuarial profession could be mostly identified with life insurance and superannuation, there are no longer identifiable boundaries to the applications of actuarial skills. This is borne out by the increasing demand for actuaries.

The CIA will admit as a Member (also known as Fellows) of the CIA, an FIAA in good standing on the proviso that the FIAA was obtained by examination, the candidate has passed the CIA's Practice Education Course (which may be attended after 12 months of relevant Canadian experience), completed 12 hours of CIA approved professional development in the previous 12 months and can demonstrate three years of practical actuarial work experience, including at least 18 months of specifically Canadian practical actuarial work experience.

These agreements effectively allow Fellows of IAAust to have their professional qualifications recognised internationally and materially enhance the capacity of Australian actuaries to work overseas and be recognised appropriately by international employers, especially in developing regions including Asia. Entering into these agreements has also facilitated further recognition by the IAAust of international actuarial qualifications thereby making it easier for actuaries who have qualified in North America to work in Australia and facilitating a more globally integrated profession. The actuarial profession is undoubtedly one of the leading professions in achieving an effectively global qualification.

3.2 Growth of Member Numbers

Membership of IAAust has grown continually over the past 10 years. Membership figures for the last decade 1990 – 2000 are set out below. The real rate of growth in the number of both fully qualified members and all members has exceeded 6% per annum compound over the last ten years.

In 1999, 15% of all qualified members of IAAust lived in 34 countries outside Australia and New Zealand. The proportion of IAAust's members living outside Australia and New Zealand has almost doubled from 8% five years ago. This reflects IAAust's success in extending its representation in South East Asia in particular.

This increase in member numbers has been achieved without any reduction in the value attributed to actuarial skills in the marketplace. Regular salary surveys conducted over the last decade in Australia demonstrate that the value of the core actuarial qualification has at least been maintained in real terms (after adjustment for inflation). This indicates that the increased supply of actuaries over this period (which has almost doubled) has been absorbed in the market by expansion of the fields in which actuaries are finding valuable new uses for their skills and by geographic expansion.

Year	Fully Qualified Members	Other Members	Total
1990	629	662	1,291
1991	687	682	1,369
1992	728	742	1,470
1993	789	776	1,565
1994	848	786	1,634
1995	905	792	1,697
1996	958	792	1,750
1997	1,025	803	1,828
1998	1,082	963	2,045
1999	1,122	1,117	2,239
2000	1,177	1,179	2,356

3.3 Developments at IAAust Itself

The IAAust represents the actuarial profession, expanding and maintaining an environment where the skills of actuaries are widely used and valued.

Its mission is to position the profession so that wherever there is uncertainty of financial outcomes, actuaries are sought after for valued advice and authoritative comment.

The IAAust:

- establishes professional standards for the protection of the public;
- provides pre-qualification and continuing professional education;
- provides forums for discussion of issues of contemporary interest;
- promotes research and development of actuarial science; and
- contributes to and informs debate on public policy.

Structure of the IAAust

With the significant voluntary involvement of hundreds of members of the profession, supported by 13 professional staff, the IAAust conducts its business – strengthening the profession, developing actuarial expertise through education and extending the influence of the profession.

Council, consisting of members who are elected for a three year term, is the body charged with overall responsibility for the corporate governance and strategic direction of the IAAust. The President and two Vice Presidents together with the two senior staff form an Executive Committee that monitors the strategic plan, allocates resources and establishes priorities.

Members elected by Council to the Presidential Group have two years as a Vice President and then hold office as President for 12 months. The Immediate Past President continues to serve for a further 12 months as the IAAust delegate to the IAA.

Six major committees reporting directly to Council cover the range of the IAAust programmes:

- Education – overseeing the development and delivery of actuarial education either through accreditation of universities or the delivery of the IAAust courses.
- Finance and Administration - handling the management, financial reporting and investment issues for the IAAust.

- International – providing the link with the IAA and communications between the IAAust and its overseas ambassadors and representatives.

- Professional Affairs – facilitating the development of professional standards and other services for actuaries, and provision of research for relevant industries.

- Public Awareness – marketing and promotion of the IAAust, its activities and the achievements of actuaries and overseeing the IAAust publications.

- Public Policy – co-ordinating and initiating the IAAust response to a wide range of social policy, legislation reforms and industry regulation issues.

Members contribute to the work of these committees and initiate programmes in policy development, education and CPD for the benefits of actuaries in particular practice areas through seven major practice committees:

- Banking and Finance

- General Insurance

- Greenhouse Gas and Energy Markets

- Health

- Investment and Funds Management

- Life Insurance

- Superannuation and Other Employee Benefits

Maintaining and Enhancing Professionalism

It is fair to say that for most of the last 100 years the purpose of the IAAust did not need to be stated. It was implicit and understood by all, and it was to provide the educational qualifications for the profession, to set educational standard and to uphold professionalism and ethics of the profession.

Professions and professional associations are under the microscope of public and political scrutiny. In many cases they are not only having to compete in ill-defined areas with industry associations that have been established for commercial as opposed to professional reasons, but in the interests of competition policy are losing their capacity to self-regulate. During 2000 initiatives have been taken to bring the actuarial professional up to date in this regard, particularly with respect to Professional Indemnity Insurance (PII), Continuing Professional Development (CPD) and IAAust's disciplinary process.

Council has investigated and committed the IAAust to the introduction of compulsory PII for members providing advice to the public and to support this has also established a voluntary PII scheme. With the increasingly litigious nature of society generally, Council had become concerned that members providing actuarial advice are properly covered against legal liability arising from any professional negligence. A survey of actuarial consulting firms in Australia conducted in late 1999 revealed that approximately 20% had no cover and a further 20% has less than $1.5 million cover. Whilst claims incurred against such firms were also found to be very low compared to most other professions, Council determined to implement recommendations from its Finance and Administration Committee to make PII cover compulsory for members providing services and/or advice to external parties by January 2002 and to adopt minimum standards for such insurance covering security, policy wording and amounts. IAAust also resolved to implement a voluntary insurance scheme, including a blanket policy for retired and part time consultants from 1 October 2000 and to publicise and promote risk management and loss prevention strategies for IAAust members.

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There has also been a review of the professional standard outlining new requirements for CPD. As actuaries progress through their careers they benefit from actively pursuing advanced skills development and maintaining currency with trends in professional practice. IAAust

members will be encouraged to plan and document their CPD programmes, ultimately for the overall improvement of the skills and knowledge of the actuarial profession. IAAust will also be improving the range of CPD activities presented to facilitate increased CPD participation by members. An annual return from each qualified practicing member certifying their compliance with the IAAust's CPD requirements will now be required, thereby highlighting the importance of CPD for all members in a practical manner.

What has been a closely knit, learned profession reliant on a high degree of camaraderie, is gradually evolving into a globally integrated profession whose members also compete in the wider market for professional services.

IAAust's Council has also initiated a review of the IAAust's disciplinary procedures. A taskforce charged with this review has had its recommendations accepted by Council at its meeting in August 2000. This will ensure that the IAAust's disciplinary process is brought up to the standards expected by the Australian Consumer and Competition Commission on behalf of the general public, once IAAust's constitution has been amended to give effect to the changes. One of the main results of this review, will be that the previous IAAust practice where Council was the final appeals body in disciplinary proceedings will be replaced by a body which includes other professionals as well as actuaries. Although it is hoped these procedures will not be called on too frequently, this is a further indication of the IAAust's commitment to raising and maintaining its professional standards to be consistent with recognised best practice.

A central function of any professional association is to provide opportunities for members to network with each other and to network with other professionals working in associated industries. In meeting these needs the IAAust organises a wide range of meetings, forums and conferences to discuss research and development, current industry practice and policy issues. These events are always open to members and frequently also extended to include affiliated professionals and representatives from government and industry bodies. Other forms of communication and dissemination of information produced by the IAAust are the Actuary Australia magazine, the quarterly Australian Actuarial Journal and the IAAust web site.

The IAAust until quite recently relied almost entirely on the voluntary involvement of its members to conduct its business. Over the last three years there has been a shift towards the engagement of professional staff to meet the increasing demands placed on the IAAust. As our members come under increased pressure within their own work environments and as a by-product of the rapidly changing business environment, the number of volunteer hours readily and reliably available for IAAust work is reducing over time. In order to provide the resources required to properly service the needs of members, IAAust has re-organised its management structure and appointed, over the last year, a new Chief Operating Officer, a new Director Public Affairs and a new Events Officer. All these positions were newly created and are now held by full-time suitably qualified professionals.

These changes are gradually altering the culture of the actuarial profession in Australia. What has been a closely knit, learned profession reliant on a high degree of camaraderie, is gradually evolving into a globally integrated profession whose members also compete in the wider market for professional services. The positive outcomes of this shift are evidenced in the increased diversity of work opportunities for actuaries, an improved media profile enjoyed by the IAAust, the development of alliances with other associations servicing affiliated professionals, and the international acknowledgement of the educational achievements of the Australian profession.

Education – Developing Actuarial Expertise

Actuarial education in Australia is well regarded internationally. The educational process includes four parts and can take some years to complete. Part I is undertaken through a university under-graduate degree or by correspondence from the UK Institute of Actuaries. The IAAust currently accredits the actuarial departments of four Australian universities offering Part I subjects.

Part II of actuarial education is the Actuarial Control Cycle, which is an innovative means for learning how to apply actuarial skills to business situations. Developed by the IAAust this programme is taught by universities in Australia. The concepts and processes of the Control Cycle underpin study of the Part III specialist subjects, offered by the IAAust. Students are required to complete two of five subjects offered. To finalise Fellowship studies, students are required to attend the Part IV IAAust Professionalism Course after which they receive their accreditation as FIAAs. Members of IAAust completing Parts I and II achieve Associateship of the IAAust (AIAA).

Because of the integral role of universities in the education of actuarial students, the IAAust continues to provide significant financial support to the education of actuarial students and actuaries at Australian Universities. In 1999 a review was conducted of the manner in which the IAAust provides ongoing financial support to Australian Universities for the education of actuarial students.

The outcome of this policy review was a new Policy Statement 12 'IAAust Financial Support for Actuarial Education at Universities' which was adopted by Council on 24 June 1999. The Policy provides that Universities receiving support from the IAAust must continue to meet the IAAust's ongoing requirements to be a Centre of Excellence of Actuarial Education (CoE) as defined by the IAAust from time to time.

The Policy notes that Macquarie University, the University of Melbourne and the University of NSW are currently recognised as CoEs and that no other university is eligible for financial assistance before 1 January 2002. The Policy also sets out the criteria to be used to determine the extent of financial support to be given to a particular CoE.

The financial support is provided to a Foundation established for each approved CoE with a Trustee board comprising a majority of trustees appointed by the IAAust and the balance appointed by the relevant university. The Foundation's Trustee board oversees the application by the CoE of any financial support provided.

The funding provided by the IAAust to university foundations of current CoEs over the years ending 31 December 2000, 2001 and 2002 will be $375,000 per year (a total of $1,125,000.00 over three years). This is a significant financial contribution to university education by the profession, representing in excess of $300 per annum per qualified actuary belonging to the IAAust or more than 1/3rd of a qualified actuary's annual IAAust membership subscription. It is a significant investment in the future of the actuarial profession about which the IAAust and the profession can be rightly proud. The cost of these payments are partially financed through examination exemption fees charged to students who have completed the IAAust accredited university courses, but a significant proportion is borne from within the IAAust's general revenues.

There is little doubt that the extent of support given to universities by the actuarial profession in Australia is unusual by comparison to either other professions in Australia or amongst actuarial bodies internationally, but it is also clear that the IAAust will need to continue to provide substantial support to university based education as the Australian government has persistently withdrawn resources from this sector in recent years and the vocational demands on our membership make voluntary 'part-time' education less viable as a means of providing 'core' actuarial education.

A great deal of consideration and professional expertise has gone into the development and refinement of the Part III specialist subjects over the last three years. However, in terms of its delivery, the Part III educational process is quite conventional. For each subject there are printed subject and reading materials, regular assignments submitted and marked with solutions provided, tutorials delivered by professionals in the CBDs of Sydney and Melbourne, and two three-hour hand written examinations at the end of the year.

It is not unusual for students to repeat Part III subjects as they juggle the demands of their full-time jobs with their studies out-of-working hours. Moreover, the traditional learning process used does not utilise the most recent thinking in techniques for adult learning. With the development of a new web site for the IAAust there is considerable expectation that it may create opportunities for electronic management and delivery of courses.

In 2000 the IAAust Council initiated reviews of the Part II actuarial programme (Actuarial Control Cycle) and the Part III Specialist Courses. These two reviews are necessarily interrelated. It would be fair to say that many members have strong views about the function of these courses in preparing actuaries for professional practice. Issues include the balance between technical and strategic business skills development, specialist versus more general studies, and undertaking a mix of subjects covering assets and liabilities rather than one or the other. The recommendations of these reviews will be debated at the IAAust biennial convention in May 2001.

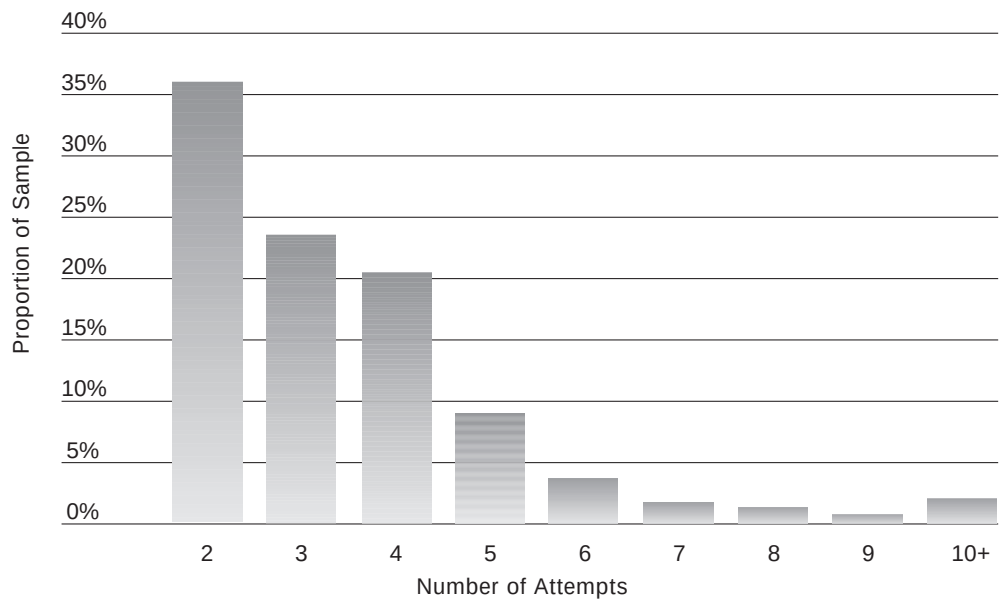
In order to focus this debate it is useful to consider an analysis conducted for Council's Education Committee of the results and experience at Part III (professional qualification) examination level for a group of 231actuaries qualifying between1996 and 1999 (inclusive). This analysis showed that the average duration taken to successfully complete the two Part III examinations required was 3.7 years (in addition to the time taken to pass the Part I and Part II examinations required to attempt Part III). In order to complete the Part III examinations, candidates must pass two subjects chosen from five possible specialist courses (Investment, Life Insurance, General Insurance, Superannuation and Finance). There are no restrictions on the combination that a candidate may select.

Candidates showed a variation between those at one extreme who pass both subjects on their first attempt to the other extreme where candidates persist at great length. This obviously has an impact on the time taken to

qualify once a candidate commences Part III. Candidates make, on average, 3.5 attempts to obtain their necessary two passes. The distribution is, as would be expected, more illustrative than the average score.

Whilst a small proportion of candidates pass two examinations in their first year, a good proportion secure their first pass in the first year, and then pass their second examination the following year. The burden of continued attempts on eventual successful candidates and on the IAAust's provision of education services to such candidates remains an issue worthy of consideration.

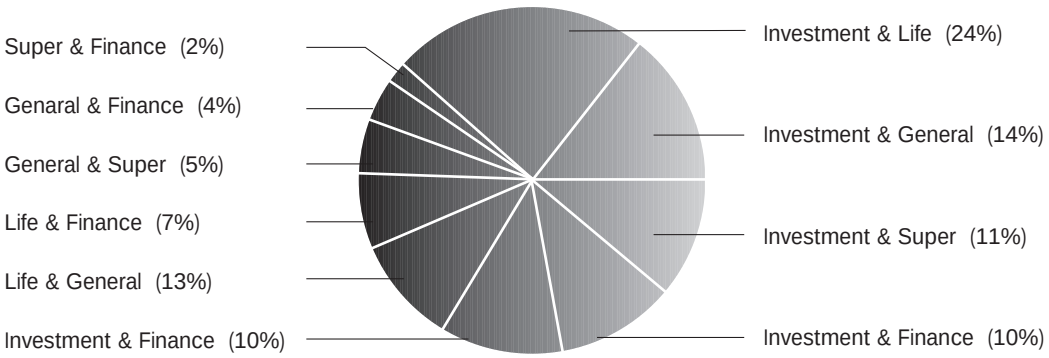
Number of Examinations Attempted to Qualify



Following the 1999 examinations, Council took an interest in what combinations of subjects students were selecting on their path to qualification as an actuary. In particular, there is some interest in the effect that might have flowed from the introduction of the Finance course, and the change to require just two subjects, that a candidate can now choose to complete the qualification requirements without undertaking a traditional 'liabilities' subject (Life Insurance, General Insurance or Superannuation).

From an analysis of the results set out below, it is clear that only 10% of candidates have adopted a combination of subjects that does not include a traditional 'liability' subject. By far the greatest proportion of candidates take at least one traditional 'liability' subject and either Investment or Finance as their other subject.

All Combinations



The analysis also showed that very few candidates changed subject area during the course of the examinations. It is also possible to consider on a subject-by-subject basis, the pass rate of candidates as set out below.

Subject	Attempts	Passes	Pass Rate %
Investment	220	131	59
Life Insurance	191	121	63
General Insurance	152	79	52
Superannuation	143	62	43
Finance	77	55	71

From this analysis it does not appear that candidates are choosing to sit for the Finance examination on the basis that it currently has the highest pass rate. In fact the opposite is true as it is still the least popular option with candidates of the five subjects currently offered. An alternative explanation is that the Finance exam may be attracting the best candidates who perceive the growing opportunities in the marketplace for those with such skills.

The main challenges in actuarial education and Continuing Professional Development for the future are:

Maintaining the Quality of the Specialist Subjects

The process of members developing and writing the material taught in the Specialist Courses is under increasing pressure because of restrictions on the time of members available to contribute to the IAAust. However the invaluable professional content provided by members practicing and expert in the particular area, together with innovative approaches to structuring the material for better learning outcomes has traditionally ensured the success of each programme.

As the work of practising actuaries changes so too must the content of the subjects to ensure relevance, and appropriate preparedness of people entering the profession. An important aspect of maintaining the quality of the programme is incorporating a continuous improvement process of evaluation and revision. Recent course revisions have experienced delays due to the reliance on the availability of practising actuaries to write the subject units on a voluntary basis. This problem could be overcome by contracting specific actuaries with the skills required on a project basis and paying them for their services to write and develop subject material.

Extending the Application of the Actuarial Qualification

The constantly changing business environment places demands on professionals to be flexible in their skills and knowledge transfer between a range of industries. Response to changes in the external environment is essential for the survival of actuaries. Actuarial training and expertise is potentially transferable across a wide range of applications however to fully exploit such opportunities actuaries require high level business skills to enhance the highly developed technical skills.

Much has been written about the importance of communication for actuaries. This need is expressed across all professions, but perhaps even more so in highly technical fields. The modelling and forecasting processes that are second nature to actuaries need to be translated and presented to other professionals and business leaders in plain language. This is indeed a challenge given the complexity of the information.

There is a need to incorporate some training in communication skills into actuarial education. This could be incorporated into the current review of the Part II syllabus and also involve providing CPD opportunities for practising actuaries to maintain and enhance their communication and presentation skills.

There is also growing evidence of the need to develop new Part III specialist subjects to cater for the demand by and for actuaries to work in new industries such as Health, Finance and Banking. This is an exciting time for actuaries in gaining recognition beyond the traditional areas of employment. Much of the work of professionals in these 'new areas' is pioneering. CPD courses and ultimately new specialist programmes are designed to meet these needs.

The resources required to develop curriculum, write subject material, collate appropriate reading material, present tutorials, set and mark assignments and examinations should never be underestimated. The process in place within the IAAust for subject development has ensured high quality subject material and continuous improvement. However, because of the extent of voluntary time commitment required from practising professionals to ensure its success, there is a degree of vulnerability about the current IAAust education process.

Actuaries working in health financing have pioneered the application of actuarial methodology in this new industry. To build their influence through numbers and skills and knowledge, the Health Practice Committee of the IAAust has developed a CPD course comprising pre-reading, written work and a practical workshop. This process provides a benchmark for the development of new subjects in the future.

Continuing Professional Development/Education

An important area for strategic development, is the function of Continuing Professional Development (CPD) for members as a means for maintaining professional standards, enhancing career opportunities and meeting the needs for life-long learning by actuaries.

Most practice areas hold an annual or biennial forum for debating current practice, industry issues, changes to regulations and government initiatives. Apart from these events there are the regular bi-monthly sessional meetings and ETDG meetings designed to discuss a research paper or a current topic for discussion across the profession. Other workshops and seminars are generally held in response to changes in legislation or perceived needs for particular skills development.

In response to this improvement of professional standards, the IAAust has a responsibility to increase the range and quality of its CPD activities. Strategic alliances with other educational bodies that have appropriate courses for actuaries in a range of areas can also be used without the IAAust having to expend its own resources. Indeed, where appropriate this process can be reciprocal.

In addressing this issue, the IAAust Council during 2000 reviewed its professional standard for CPD. This has resulted in recommendations to improve processes for monitoring self-regulation and provision of more activities by the IAAust so that members can meet their CPD needs. A newly constituted CPD committee together with the staff appointment of an Events Co-ordinator has given a boost to planning and development of the CPD programme.

Supporting Research and Development Which is Intrinsic to Actuarial Practice

Research and development is vital to national growth and enterprise success in business. It is a fundamental skill for professional practice, however, it is assumed this skill is being developed at universities. Research conducted in professional practice and at universities is different.

There is a need for the actuarial profession to harness this intellectual output through the IAAust programmes and publications. Time and resources necessary for practising actuaries to conduct research and write papers are under pressure. The IAAust research grants programme is being re-activated to generate interest in and support for research and the Australian Actuarial Journal (AAJ) has been up-graded to meet international standards with the expectation of attracting high quality papers for publication.

The IAAust also has a role to play in supporting the universities in their quest to improve research output. Few PhD students have come out of the university actuarial centres, and yet these are the professionals who enter academic life and provide the intellectual rigour the profession needs for its future.

Part 4 : Current Developments of Professional Interest to Actuaries

Over the past three years the IAAust has taken a more pro-active approach to its obligation to represent the profession. While the objects for which the IAAust was established included determining matters for public comment, conferring and collaborating with other organisations and commenting on the actuarial aspects of legislation, these objects were not pursued in a particularly public or vigorous way prior to 1997 and the IAAust was not structured to be outward looking and pro-active.

In 1997, the IAAust's centenary year, the IAAust initiated changes including the appointment of an Executive Director who was not an actuary but who had considerable media experience. Then in 2000 a new senior staff position of Director, Public Affairs was created to address the growing role for the IAAust in public and media debate on social issues and legislative reforms. Accordingly, the IAAust is now well positioned to prepare submissions to major enquiries and provide advice to governments and government organisations, thus fulfilling a key responsibility on behalf of the profession. In addition, regulators, government ministers, opposition spokespersons, government advisors and associated industry representatives have increasingly been invited to present or contribute to debate at the IAAust forums and conferences.

This trend towards a more outward looking and active profession is reflected in the extent of recent areas of IAAust interest and activity which are described more fully below.

4.1 Genetics

In March 2000, the IAAust established a genetics task-force which is drawing on the expertise of professionals other than actuaries, including Paula Stapleton, a geneticist and Kristine Barlow-Stewart, Director of the Genetics Education Program of NSW. Broadly stated, the objectives of the IAAust genetics task-force are to examine the emerging impact in Australia of the Human Genome Project and genetic research in general. Its aims include, but are not necessarily limited to, impacts of immediate interest to members of the actuarial profession and the public interest.

One of the roles of the actuarial profession is to inform public debate by helping to clarify the possible technical, statistical and financial implications of particular policy decisions. Actuarial research and skills can make a positive contribution to discussions on these issues.

The task-force has an ongoing educational responsibility to IAAust members and will be presenting a detailed paper and discussing policy at the IAAust Biennial Convention in May 2001. In the meantime, the task force is actively engaged in the current public debate regarding genetics and insurance. Advances in genetics have the potential to provide more specific information about the mortality and morbidity prospects of individuals. Genetic information may indicate a higher than normal probability of contracting a particular condition and experiencing a correspondingly higher morbidity and/or reduced expectation of life.

There is community concern about the likelihood of insurance companies discriminating on the basis of such information. Doctors want to make sure that concerns about insurance do not interfere with clinical decisions. Insurance companies are concerned about the possibility and implications of adverse selection if genetic information is available to their customers but not to them.

Public assertions of discrimination against healthy Australians on the basis of genetic tests in insurance and employment contexts have already prompted calls for legal reform. Australia lags behind Europe and most American States by not having specific laws regulating the use of genetic testing in employment and insurance.

Senator Natasha Stott Despoja has been prominent in the political push in Australia for legislation in this area. She has been supported by High Court Judge Michael Kirby, a member of the ethics committee of the Human Genome Organisation, who has spoken out on the need for laws and practices to avoid irrational and unfair genetic discrimination. The Federal Government is aware of the potential for discrimination and has recently announced an enquiry into the issue.

The DNA test for haemochromatosis is the first genetic test to be included on Australia's Medicare schedule and for which a rebate is available. There is no doubt that life insurers in Australia will see an increased number of DNA test results for haemochromatosis. It will therefore be important for the life insurance industry to demonstrate its capability to handle disclosed genetic test results.

One of the roles of the actuarial profession is to inform public debate by helping to clarify the possible technical, statistical and financial implications of particular policy decisions. Actuarial research and skills can make a positive contribution to discussions on these issues. Actuaries can explain that the relationship between genes and insurance risk is complex and that it is likely to be some time before the relationships are

better understood and before any tests with real predictive value are developed (other than for a few single gene disorders) and are able to be adopted for underwriting purposes. Actuarial modelling can be used to explore the magnitude of the effects of anti-selection from these developments and where necessary make adjustments to current risk classification and management frameworks.

4.2 International Insurance Accounting Standard and Solvency Requirements

Insurance accounting is an area where there are many developments of interest to actuaries. The IAAust has been providing regular input to the International Actuarial Association (IAA) for its submissions on these developing issues. The IAIS has also recently produced its submission on the insurance accounting issues paper produced by the International Accounting Standards Committee late last year.

The IASC began looking at insurance accounting in April 1997 and an issues paper containing some controversial proposals was made public in December 1999. This project is aimed at accounting for insurance contracts rather than all aspects of accounting for insurance enterprises, so it may lead to a mix of accounting treatment within an insurance enterprise.

It is proposed that assets and liabilities that arise because insurance contracts are entered into are measured and then profit is derived from the change in the value of assets and liabilities over time. This contrasts with the current approach of measuring income and expense and deferring items to match the periods in which they are measured to determine profits.

Working on the assumption that IAS 39 will be replaced by a new International Accounting Standard requiring full fair value accounting for the substantial majority of financial assets and liabilities, it is proposed that insurance liabilities should be measured at fair value, but the detail of how this could or should be done will be controversial and take some time to work through. It is difficult to see how such a standard can reasonably be developed in less than three to five years and it may take longer – especially as the aim is to produce one standard to cover both general and life insurance.

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Associated with this is a separate initiative of the IAIS to coordinate the regulation and capital adequacy/solvency requirements of insurers globally in a manner similar to the regime already being developed by BIS for banks internationally. Australia's Craig Thorburn, a member of the Council of IAAust, is chairing the IAIS's Solvency Sub-committee which has the task of producing internationally accepted solvency requirements by 2002.

4.3 General Insurance

In 1998, the newly formed Australian Prudential Regulation Authority (APRA) commissioned an assessment of the prudential supervisory requirements for general insurers with a view to eventually making recommendations to the Government on ways of modernising and improving the general insurance regulatory regime in Australia.

In early 1999, two working groups of the IAAust made recommendations to APRA on establishing consistency and reliability in outstanding claims provisioning; and on the development of a practical minimum solvency standard which is more responsive to the variations in risk facing general insurers with different business portfolios.

The IAAust's input was incorporated into the discussion paper issued by APRA in September 1999 entitled 'Study of the Prudential Supervisory Requirements For General Insurers in Australia'. Comments were invited and the IAAust provided a response in December 1999. In April 2000 APRA issued a policy discussion paper on its proposed reforms to the prudential supervisory requirements for general insurers in which it set out a refined version of the reform proposals in the September 1999 papers, taking into account feedback from the industry in recent months.

This has been followed by a seminar held by APRA in May 2000 to present and discuss their proposals and the release of draft standards on liability valuation, reinsurance, capital adequacy and risk management. A third round of consultation is expected prior to the introduction of legislation and regulations in 2001 which will give effect to the proposals which will take effect over a transition period that may extend up to five years from mid 2002.

The relevant expertise of the actuary lies in the identification and assessment of financial risk, in all its forms, and in the application of the principles of control cycles to the management of financial entities which carry risk. The actuarial paradigm involves a prospective orientation, and focuses on the likelihood of particular outcomes.

APRA is proposing an amended and simplified Insurance Act that will have high-level principles for prudential supervision and a power for APRA to make standards to carry out that responsibility. The standard-making power would be qualified by obligations to consult and conduct cost-benefit assessments whenever significant changes were contemplated.

The APRA proposals are in line with the direction of international developments in regulatory requirements, in particular to have capital and solvency requirements attuned to the risks of the underlying business conducted and to reflect asset as well as liability risks. This is consistent with the global trend towards regulation that requires institutions to put in place their own market based policies and procedures for controlling risks which are material to the solvency and on-going viability of the institution thereby allowing the regulator to place more reliance on the institution's self assessment of its own risk management practices.

The aim is to introduce new arrangements that:

- improve policyholder security for customers of general insurers operating in Australia;
- are both more discriminating and comprehensive in addressing the risks that companies underwrite than at present – differentiating more between high and low risk business, and covering risks that are not now addressed in solvency calculations;
- are more flexible and capable of being adapted over time as required;
- allow more reliance to be put on companies' internal risk management systems, and generally give more weight to the responsibility and accountability of a company's board and senior executives for its prudent management;
- will improve the consistency and transparency of indicators of companies' strength providing, in particular, for more consistency in calculations of provisions for policy liabilities;
- are fully consistent with developments internationally; and
- are closer in structure to the more modern supervisory arrangements for life insurers and deposit-takers.

The APRA proposals have introduced a requirement for regular actuarial certification of outstanding claims and unexpired risk reserves for all but the smallest general insurers operating in Australia. This is a significant development for the actuarial profession which recognises the increasing influence of the profession in the general insurance industry over the last two decades. It does however also place those actuaries asked to accept these statutory roles with the added responsibility of ensuring that the objects of the regulation are realised.

The IAAust believes that the actuarial profession has much to offer in the further development and implementation of a satisfactory framework for prudential regulation of general insurance and other businesses regulated by APRA. The relevant expertise of the actuary lies in the identification and assessment of financial risk, in all its forms, and in the application of the principles of control cycles to the management of financial entities which carry risk. The actuarial paradigm involves a prospective orientation, and focuses on the likelihood of particular outcomes. We believe this is a particularly fruitful approach for regulators to adopt, to complement the reporting of historical events.

These methods have typically been applied in the past in the management of financial risks associated with life insurance, superannuation and various investment products. The consistent application of the principles underlying these methods and models, across the various sectors of concern to financial regulators enable the relative strengths, weaknesses, and potential areas of exposure in each sector to be better understood. This will need to remain as one of the key issues in the harmonisation of the intensity of prudential regulation in Australia if the potential for regulatory arbitrage is to be avoided.

4.4 Health Insurance

Over the last few years, the IAAust has had significant input into the reform of private health insurance in Australia. This has included the development of unfunded lifetime community rating (now labelled by the Government as Lifetime Health Cover), reform of the health insurance reinsurance arrangements (now

deferred by the Government) and the preparation of Solvency and Capital Adequacy Standards for the industry.

Lifetime Health Cover was introduced by the Government on 1 July 2000. The introduction of Lifetime Health Cover was a key recommendation of the Industry Commission's Report into Private Health Insurance which was released in April 1997. Following the release of the report, an IAAust Task-Force prepared a report on Lifetime Health Cover which was presented to a number of industry participants and significantly raised the profile of the IAAust within the industry.

The growing professional involvement of actuaries in recent years in the health field is an excellent example of what can be achieved by the profession applying its skills and resources in new practice areas.

The co-existence of Medicare and universal community rating for private health insurance had been a major factor in causing membership of the privately insured population to gradually fall from around 50% to around 30%. The introduction of Lifetime Health Cover aimed to change paradigms in order to try to change behaviour and was thought to be capable of reversing past trends. The IAAust projected that the adoption of an appropriate Lifetime Health Cover model should make private health insurance more affordable, more attractive and hence more popular, thereby enhancing the viability of the private health insurance system and helping to reduce pressure on Medicare.

Subsequent to the Task-Force's report, the IAAust was invited to make submissions and presentations to a number of government and departmental committees in respect of the introduction of Lifetime Health Cover. Similarly the IAAust's input into the reinsurance reform process was actively sought and highly regarded by the Department.

The wider health field offers significant opportunities for the profession. The IAAust has held a seminar on health financing and is currently discussing a joint research opportunity with the Australian Private Hospital's Association. Issues associated with long term care and health financing are also being explored.

Over the past few years the IAAust has also formed a strong mutually beneficial relationship with the health insurance regulator, the Private Health Insurance Advisory Council (PHIAC). The IAAust has actively involved PHIAC in the development and presentation of its health education courses.

PHIAC has provided a regulator's perspective to the education of actuaries and enabling actuaries to identify with PHIAC's concerns in respect of risks and prudential management of the industry. IAAust's most recent involvement with PHIAC has been in respect of the solvency and capital adequacy standards which were developed by PHIAC. The IAAust made three submissions during the consultation process and the input of the profession was well regarded by PHIAC.

The IAAust's increased involvement in the industry has been supported by PHIAC which sees actuarial input contributing to the prudential management of the industry. The excellent relationship developed with PHIAC is evidenced by the fact that at a recent PHIAC seminar for health insurance finance staff on the practical application of the solvency and capital adequacy standards, six members of the profession were invited to make presentations.

Coinciding with these developments, the last few years have seen an increasing involvement of actuaries in the private health sector. Most of the major health insurance funds currently use actuaries to assist in their pricing and prudential management. The increasing complexity of health insurance and the introduction of the new solvency and capital adequacy requirements are likely to result in the increased involvement of actuaries in the private health insurance industry.

To provide further support the increased involvement of actuaries working in the health insurance area the IAAust developed, in conjunction with PHIAC and the Department of Health, a major Health CPD course – held twice in November 1998 and March 2000. This is expected to lead to the development of a sixth Part III IAAust professional qualification course. In addition, the IAAust is developing guidance notes and professional standards for actuaries working in this field covering technical aspects of outstanding claims, solvency and capital adequacy.

In the wider health field, health financing is becoming a significant issue. Whilst actuaries do not have a major involvement in this area currently, the IAAust is working to develop our education system to equip actuaries for the challenges and opportunities that exist in this field.

The growing professional involvement of actuaries in recent years in the health field is an excellent example of what can be achieved by the profession applying its skills and resources in new practice areas.

4.5 Life Insurance

The IAAust has provided (and continues to provide) considerable input to the Australia Tax Office (ATO) during the development of legislation to implement the Business Tax Reform measures affecting life insurance companies.

The Government announced its overall tax reform strategy with the release on 13 August 1998 of the document A New Tax System, which outlined a strategy for business tax reform and some specific reforms relating to the taxation of income from entities. This was followed by the establishment of the Review of Business Taxation (RBT), chaired by John Ralph.

The IAAust made an initial submission to the Treasurer in October 1998 and then a further submission to the RBT in April 1999, which included detailed comments in relation to the taxation of collective investment vehicles, pooled superannuation trusts, superannuation funds and life insurers and their policyholders.

The IAAust suggested identifying an agreed set of principles and objectives to guide such consultation including:

- life insurance superannuation business and deferred annuities should be taxed consistently with all other forms of superannuation;
- other life insurance savings and investment business should be taxed consistently with widely held collective investment vehicles;
- risk insurance should be taxed on consistent principles with general insurance;
- only shareholders of life insurers should be taxed on an entity taxation basis, while customers should be taxed on a similar basis to customers of other financial institutions, such as banks, unit trusts, etc;
- grandfathering rules for existing policyholders should be subject to the provisions of existing contracts; and
- transitional rules should apply to the calculation of taxable income to ensure that shareholders are not unfairly disadvantaged due to the imposition of a new tax system on long term contracts.

The main IAAust submission to RBT was followed up with more detailed technical submissions on specific issues.

The report 'Review of Business Taxation: A Tax System Redesigned' noted that, 'Currently, life insurers – that is, life insurance companies and friendly societies – are exempt from tax or are taxed at concessional rates on some management fees, underwriting profit and the profit they derive on immediate annuity business'. The system was described as 'complex, distortionary and inequitable'. The report said, 'To ensure competitive neutrality and consistency with similar entities, life insurers should be taxed on all the profits they derive, at the company rate of tax.'

The report recommended moving from the existing regime for taxing insurers to a new corporate regime on 1 July 2000. Transitional arrangements allowed one third of management fees to be excluded from the taxation of life insurance companies for the next five years. In response to the report of the RBT the Government introduced the New Business Tax System (Miscellaneous) Bill (No.2) 2000 to amend the Income Tax Assessment Act 1936 (ITAA 1936) and the Income Tax Assessment Act 1997 to ensure that life insurance companies are taxed on all the profit made from their different activities in broadly the same way as activities in other entities that are similar in economic substance.

The last Parliamentary sitting day in June 2000 (29 June 2000) saw the passage of five New Business Tax System (NBTS) Bills, with Royal Assent following on 30 June 2000. Although a majority of measures were passed in their original form, some amendments were made to remove the measures that relate to superannuation funds, including the contentious provisions which deal with the application of CGT when self-managed superannuation funds convert from an accumulation fund to a pension fund. These provisions were removed pending further debate. It is intended that these provisions will be re-introduced in a subsequent Bill. Following the removal of the proposed changes (to the tax exemption of investment income related to pension liabilities) from the final Bill passed, the ATO requested further input on alternative ways in which the Government's objectives could be achieved and the IAAust continues to be involved in discussions with the ATO on a number of practical implementation issues.

In July 2000 Tony Regan, Assistant Commissioner, ATO wrote to the IAAust to express his appreciation for the IAAust's contribution during the development of the legislation to implement the Business Tax Reform measures affecting life insurance companies.

To assist in the implementation of these changes, the IAAust has recently issued current Discussion Notes concerning the impact of tax reform on life insurance financial reporting covering:

- Change of Tax Basis and Life Insurance Financial Reporting
- New Tax Rules and Profit Allocation for Participating Super Business
- Timing Aspects of Profit Margin Calculations
- Treatment of Transitional Tax Relief and Varying Tax Rates

If future governments expect the well-off to be more self-reliant – perhaps the ultimate extension of mutual obligation – we need to address the structures needed and the incentives and/or compulsion to be provided to save for retirement.

4.6 Superannuation

At the IAAust Superannuation Forum held in May 2000, the Federal Government's proposed choice of fund legislation was debated, particularly in the context of the draft IAAust policy document on disclosure prepared by the Superannuation and Employee Benefits Practice Committee. Taking into account the input received at the Forum, the contentious issues were discussed by the IAAust Council and the document was finalised in August 2000.

Currently the choice of superannuation funds legislation is delayed in the Senate. However, the Government has a firm commitment to providing choice of superannuation funds to employees. It has also stated that the choice of fund legislation will be accompanied by enhanced disclosure requirements in line with the new CLERP 6 framework.

The IAAust welcomes a focus on disclosure in a choice of fund environment. Implementation of the choice of fund legislation will have a significant impact on the provision of superannuation for Australians. It is extremely important that appropriate disclosure standards are settled before choice of fund legislation comes into effect.

Once the disclosure standards are settled there also needs to be sufficient lead time before the legislation is implemented to enable superannuation providers to meet the requirements. This will ensure that when choice is implemented, employees will be able to make informed choices.

Choice must be implemented in an environment where employees are provided with easy to read, accurate and reliable information, prepared on a consistent basis to allow them to appropriately compare different superannuation funds.

The classic case of how things can go wrong if disclosure rules do not operate properly is provided by the recent pension mis-selling scandal in the UK. Hundreds of thousands of employees were persuaded by pension salesmen and the companies they represented (including major banks and insurance companies) to switch from occupational pension schemes provided by their employers into personal plans provided by the companies. It turned out that in many cases, the employees were much worse off than if they had stayed in their original schemes. The banks and other pension providers stood accused of failing to give their customers suitable advice and sufficient information on the costs and benefits of making the switch. The end-result is that the offending companies have been 'named and shamed' by the Government and required by regulators to pay many billions of pounds in compensation. Some industry commentators have estimated the compensation cost to the industry to be as high as 18 billion pounds. The reputation of these firms has suffered as a result.

In the UK, as in Australia now, rules took effect about the same time personal pensions became available whereby pension sellers were required to 'know' their customers by obtaining detailed information from them and provide an adequate comparison between the client's existing plan and a personal one, but many UK companies found that their customer records in this respect were in disarray or nonexistent.

The UK debacle suggests that if Australians are to be allowed to choose who will manage their superannuation savings, the way this is done will have to be structured so as to protect consumers. High standards of disclosure in sales documentation will materially assist this objective.

On a separate but related issue, the Treasurer made some comments, after bringing down the Federal Government Budget in May 2000, along the lines that after the current tax reform changes are bedded down, superannuation reform is the next challenge. The IAAust supports the need for such a review and took the opportunity to correspond with the Treasurer making some suggestions in this regard. IAAust also canvassed the concept of an industry coalition to work towards 'speaking to the Government with one voice' on the issue of a superannuation review.

Following this initiative, the first 'Super Round Table' meeting took place in June 2000 involving senior representatives of IAAust, the Association of Superannuation Funds of Australia (ASFA), Investment and Financial Services Association (IFSA), the Financial Planning Association (FPA), the Australian Retirement Income Streams Association (ARISA), the Institute of Chartered Accountants, and the Law Council. The value of determining areas of commonality was discussed with a view to having a co-ordinated voice and subsequently it was decided that other appropriate industry bodies should be approached with a view to expanding support for a set of agreed 'principles'. The principles developed were put to the Government, the Opposition and the Democrats and will be useful for benchmarking options for any superannuation reform, although the Government now seems to be backing away from further discussion about a review of superannuation, while the Opposition has indicated its intention to undertake a full scale review. A statement of these principles is set out in Appendix 2.

The IAAust believes that a wide enquiry is needed to address, in addition to the simplification of tax and other aspects of superannuation, broader questions such as Australia's national retirement savings policy and whether the current level of contributions will be adequate given the impact of demographic factors and the likely impacts of the genetic revolution.

If future governments expect the well-off to be more self-reliant – perhaps the ultimate extension of mutual obligation – we need to address the structures needed and the incentives and/or compulsion to be provided to save for retirement. A major part of the review may need to look at what improvements can be made to the present so-called three pillar system – a government, means-tested pension as a safety net, the savings generated in the compulsory system and extra self-provision by people above the compulsory system.

The three pillars system is generally admired by the rest of the world but it could do with some fine-tuning. For instance, as more retire with superannuation savings, integration of the private system with the government pension will become more critical. Then there is the major questions of whether the present superannuation savings model – often based on 1950s and 1960s assumptions about work patterns and lifestyles – needs to be upgraded to cope with the 21st century. For instance, how should interrupted work patterns (especially mothers) be handled and how to cope with people who want to retire gradually rather than abruptly?

The IAAust's immediate past president, David Knox, has also suggested a fourth pillar – part time employment in semi-retirement. Why shouldn't people after 60 scale down and work only two or three days or take the winter off? By not formally retiring, they maintain an interest and an income and avoid being a liability to the Government.

An associated area for review and reform is the taxation of superannuation and retirement income. The superannuation industry as a whole argues that the present system is complex, inefficient and costly – and hence off-putting. At a time when Australia badly needs a savings culture to avoid relying on the rest of the world financing our deficits, saving for the future via superannuation is a long term, targeted source of national savings.

At present, the Government realises at least $4 billion to $5 billion a year from taxes on superannuation fund contributions and earnings. Superannuation is taxed at the contributions stage, while it is invested and earning money and in many cases when paid out as a benefit. Other comparable countries such as the USA, UK, Canada and many European countries don't tax contributions and allow earnings to accumulate tax-free (Denmark, New Zealand and Britain tax earnings but the USA, Canada, Ireland and the Netherlands don't).

Any large-scale tax reform that shifts the present taxes onto end-benefits will require a transition plan that doesn't leave a 'black hole' in government revenue and which also doesn't significantly penalise existing superannuation fund members and pensioners.

4.7 Banking and Finance

Since 1988, the Basel Committee on Banking Supervision (the Basel Committee) has been developing improved methods of regulating the financial position of banks around the world. The need to measure risk-based capital for bank's credit risk was first recognised by regulators in the original Basel Accord issued in 1988.

This was followed in 1995 and 1998 respectively by regulations covering capital required for market risk and for credit derivative contracts. In Australia, the Wallis Committee Financial System Inquiry led to the creation of the Australian Prudential Regulation Authority (APRA), bringing together for the first time one regulator covering all prudential regulation of different types of Australian financial institutions. The introduction in recent years of sophisticated internal computer models also allowed banks to measure risk and set capital requirements tailored to their individual needs once these models and processes were approved by relevant national regulators, including APRA in Australia.

The work and responsibilities of a group risk manager in a banking group are very similar in concept to those of an appointed actuary in life insurance or the proposed approved valuation actuary in general insurance.

In June 1999 the Basel Committee issued a further consultative paper introducing a new capital adequacy framework to replace the original 1988 Accord. Coinciding with this development, in February 1999, the Joint Forum issued discussion papers on capital adequacy issues affecting financial conglomerates and APRA issued a Policy Discussion Paper on similar issues in March 1999. The IAAust responded to these developments with submissions to both the Joint Forum and APRA on the Basel Committee, Joint Forum and APRA discussion papers in July and September 1999 and March 2000, based upon the work of the IAAust's Prudential Regulation Taskforce.

The common themes recurring within these recent developments are the need to:

- promote and secure the safety and strength of the world's financial system;
- enhance competitive neutrality both geographically and between different types of financial institution;
- assess capital adequacy with a comprehensive approach to addressing risks;
- apply the principles of regulation adopted at varying levels of complexity and sophistication; and
- address the effects of both financial innovation and convergence of financial services entities in recent years to ensure that capital requirements match a financial institution's true risk profile.

In applying these principles in the future, the actuarial profession will need to work with others to develop a common lexicon and methodologies to monitor and control risk in what were once two different businesses – banking and insurance.

Consistent with this need, David Knox, in his Presidential Address last year (p.33 'Broadening our Membership') raised the issue of whether the IAAust should broaden its membership beyond those who have completed a set of actuarial examinations through a similar organisation. He noted that the UK Institute and Faculty have introduced two new membership categories, namely Honorary Fellows and Affiliates.

He noted that APRA's prudential regulation of Authorised Deposit Taking Institutions in Australia requires a series of statements involving a 'group risk manager'. The work and responsibilities of a group risk manager in a banking group are very similar in concept to those of an appointed actuary in life insurance or the proposed approved valuation actuary in general insurance.

As a profession, we need to establish ways to link up with individuals who clearly have the training and experience to accept the significant responsibilities associated with group risk management roles. Exploratory discussions have established that a willingness does exist to explore ways of how we could amend our membership such that these individuals could join the IAAust with appropriate recognition, and receive corresponding benefits.

The IAAust Banking and Finance Practice Committee has been asked to consider this matter further by contemplating the possible creation of special class of member who could demonstrate that they had passed an appropriate examination. In this context it is worth noting that the Society of Actuaries in the USA has recently acknowledged the examination used by the Global Association of Risk Professionals ('GARP') as suitable for CPD purposes for SoA members. As the name implies, GARP is a global organisation but it is also active in Australia with over 140 members in this country who attend its regular meetings and forums. Its focus is on risk management education, particularly in banks, covering credit risk, market risk, operations risk, capital allocation and quantitative analysis. Unlike the IAAust however, membership of GARP is currently free, its operations being financed by corporate sponsorship. It is expected that the IAAust and GARP may well jointly sponsor functions of mutual interest in future.

4.8 Investment - CLERP

A major development of interest to actuaries working in the investment and funds management areas has been the Corporate Law Economic Reform Program (CLERP). This comprehensive Federal Government initiative to improve Australia's business and company regulation is part of the Government's drive to promote business, economic development and employment. The scope of CLERP covers a wide range of financial products including securities, derivatives, general and life insurance, superannuation, deposit accounts and non-cash payments. The regime will apply to the activities of existing financial intermediaries such as insurance agents and brokers, securities advisers and dealers, and futures brokers, as well as any other person carrying on a financial services, financial planning or financial advisory business.

The aim of the regime is to achieve a competitively neutral regulatory framework which provides more uniform regulation, thus reducing compliance and administrative costs and removing unnecessary distinction between products. Further, consumers will enjoy a more consistent system of consumer protection. The draft Bill proposes a regulatory framework for the financial services industry that facilitates innovation and promotes business, while at the same time ensuring adequate levels of consumer protection and market integrity. It is intended that the flexible and adaptable framework proposed will encourage innovation and competition in markets and clearing and settlement facilities.

CLERP was originally announced by the Treasurer in March 1997 and will result in reforms in a number of key areas of corporate and business regulation. The programme has been carried through with the aid of the various publications, including a Policy Framework document, followed by seven Proposals for Policy Reform papers (the CLERP papers). The IAAust made submissions in response to the various papers, the last one being 'Implementing CLERP 6 – Response to Consultation Paper' dated 19 April 1999.

Actuaries are recognised by the Government as being ... already subject to a range of strict professional requirements including competence and ethical standards and are subject to disciplinary procedures where they breach those standards.

On 11 February 2000 the Minister for Financial Services and Regulation, Joe Hockey, released the draft Financial Services Reform Bill (the FSR Bill) and Commentary. He noted that the draft legislation puts into effect proposals contained in the Government's CLERP 6 consultation paper 'Financial Products, Service Providers and Markets – An Integrated Framework' released in March 1999, and will implement a number of recommendations of the Financial System Inquiry (perhaps better known as the Wallis report).

The draft legislation provides for:

- uniform regulation of all financial products;
- a single licensing framework for financial service providers;
- minimum standards of conduct for financial service providers dealing with retail clients;
- uniform disclosure obligations for all financial products provided to retain clients; and
- flexibility for authorisation of market operators and clearing and settlement facilities.

The Parliamentary Joint Statutory Committee on Corporations and Securities sought submissions in the course of its inquiry into the FSR Bill. The Department of Treasury also sought comments by way of submission.

In April 2000 the IAAust made a submission to Treasury in relation to the FSR Bill. Overall the IAAust supports the legislation, and believes that to a large extent it reflects the concerns and requirements expressed in its previous submissions.

The key concerns of the IAAust related to ensuring that:

- the legislation establishes the same framework for all products, and that no special conditions are included in the legislation;
- the application of the licensing requirements on employers and trustees is clarified, and that this issue is revisited when the Choice of Fund legislation is introduced; and
- the disclosure requirements are extended when the Choice of Fund Legislation is introduced.

There is a significant development in the recognition of the actuarial profession included in the FSR Bill. Previously the Corporations Law allowed an exemption from holding a financial products dealers' licence, or a proper authority from a licensed dealer, where a person was merely giving incidental advice in the course of their professional practice. Only two professions were recognised for the purpose of this exemption – lawyers and accountants. The FSR Bill proposes that the equivalent exemption should be widened. ASIC will be able to nominate members of what are called 'declared professional bodies' to be exempt from the new licensing requirements. It is clear from the commentary on the FSR Bill that the exemption is intended to include actuaries, alongside lawyers and accountants.

IAAust welcomes this development. Our April 2000 submission to Treasury on the FSR Bill said: 'The IAAust notes with approval that actuaries are recognised by the Government as being … already subject to a range of strict professional requirements including competence and ethical standards and are subject to disciplinary procedures where they breach those standards.' (paragraph 5.45).

Nevertheless, ASIC cannot be expected to lightly approve a 'declared professional body'. Substantial safeguards will have to be in place. The FSR Bill commentary material indicates that these were likely to be in the fields of training, supervision, compensation arrangements (for losses from bad advice), dispute resolution processes, conduct and disclosure requirements and disciplinary powers. No details are yet available of what those requirements would be but the IAAust is likely to seek an appropriate declaration from ASIC once the full requirements and procedures are known and will be consulting on these issues with ASIC.

The Government is committed to enactment of the FSR Bill in 2001. However, there may be some delays because of the High Court decision in Hughes case which has thrown into doubt the Commonwealth Government's constitutional power in relation to aspects of the administration of the Corporations Law scheme.

4.9 Emerging Actuarial Activities

Energy Trading

Following the adoption of the recommendations of the Hilmer report the Electricity industry in Australia has been the subject of extensive industry restructuring over the last five years. The objectives of this reform, which have created a national electricity market where previously no competitive market existed were to provide lower sustainable electricity prices to consumers, increase industry efficiency to world's best practice, maximise customer choice, encourage efficient investment, protect customer service and safety standards through an appropriate regulatory environment and ensure long-term security of supply.

The reforms introduced have provided a framework for a sustainable and effective competitive energy market. Because electricity cannot be cost effectively stored in large quantities, the prices quoted in the market can be quite volatile. This creates considerable financial risk for market participants depending upon the factors affecting supply and demand for power from time to time. These risks, in turn, have created opportunities for actuaries to assist market participants to manage their commercial exposures consistent with the operating imperatives of their businesses. In the July edition of Actuary Australia, Raymond Yeow, one of several members of the IAAust working in this area, wrote about his work in electricity trading and the associated area of weather derivatives contracts. He noted that the commercial electricity market is only four years young in Australia. Previously, electricity markets were regulated by the relevant government departments in each state. On a global basis, some parts of Europe (particularly the UK) have also been deregulated and Japan will deregulate within the year 2000.

The factors affecting supply and demand for power from time to time ... have created opportunities for actuaries to assist market participants to manage their commercial exposures consistent with the operating imperatives of their businesses.

There are already several actuaries and students involved in this field in Australia, advising generating companies, retail and distribution companies and electricity trading companies. Near term power prices are very volatile, and subject to a multitude of variables such as temperature, supply factors including generation capacity, and a competitive auction process by generators to supply electricity every five minutes (power prices in the wholesale market are set – and therefore vary – every five minutes). This means that there are over 100,000 different prices in a calendar year for each region.

Some of the items to be considered include:

- Analysis of physical factors such as daily weekly and seasonal cycles.

- Will the temperature be hot or cold? Will there be an unusual number of extremely hot days?
- Supply features – is there enough water in the dams?
- Can the mean failure rate of generators be predicted?
- Can we discern from the auction process the future intentions of participants?

The ability to think logically and account for interaction and feedback processes in the analysis is very important. With such volatile prices, generators and retailers hedge with electricity derivatives such as swaps and options. A knowledge of stochastic calculus is absolutely essential and it is fortunate that the IAAust introduced the Finance specialist subject in the mid1990s to capture this trend. However, electricity derivatives are even more complex than foreign exchange and interest derivatives, both in specification of the underlying price process, and in the nature of the optionalities.

Weather derivatives are a natural extension of a presence in the power market as temperature is a key driver of demand for power, especially in summer when demand for air-conditioning rises. This is an example of de-composing risk into its smallest possible homogeneous fragments so as to enable more accurate measurement and management of the risk. Weather contracts have mostly involved temperature, but rainfall and wind-strength contacts have also been traded.

Greenhouse Gas Advisory Work

The international moves commenced in 1997 in Kyoto to reduce greenhouse gas emissions has the potential to impact many industries as the previously free right to emit greenhouse gas will come at a price in the future. This has important competitive cost implications for many commercial enterprises. Given the long term risks and uncertainties involved, there are opportunities for actuaries to assist those likely to be affected to:

- develop their corporate climate change strategy;
- assess the expected impact of emissions trading on existing operations;
- analyse the commercial and financial impact of 'Clean Development Mechanism' projects that can be used to transfer emission credits between parties; and
- assess the impact of climate change policy on the economics of new investment projects.

In the July 2000 edition of Actuary Australia a Fellow of the IAAust, Stewart McCarthy wrote about his experience providing climate change advice. He noted that over the past few years, a variety of international and domestic policy initiatives that seek to reduce emissions of greenhouse gases have been developed.

The Kyoto Protocol, an international treaty negotiated in 1997, imposes limits on the emission of greenhouse gases by developed countries. For example, Australia has an emissions target of 108% of 1990 levels to be achieved by the commitment period of 2008-12. While the Kyoto Protocol has not yet been ratified, it is expected that this treaty, or something similar, will enter force in the near future.

In Australia we have also seen a variety of voluntary and mandatory policy initiatives that require business to manage or reduce greenhouse gas emissions. Examples include the recently announced '2% renewables' programme, which requires wholesale electricity purchasers to lift the proportion of renewable energy purchased or face penalties. The general public sees climate change simply as an environmental issue. However, business must understand that climate change, or more correctly, the legislative response to climate change, represents a serious financial and business problem.

The basis of much climate change mitigation policy is the imposition of financial penalties for the emission of greenhouse gases. In Australia, the Government's favoured approach for achieving greenhouse targets is through a national emissions trading scheme. Emissions trading is claimed as the least cost mechanism to achieve a defined emissions target because it harnesses the power of the market to seek out the cheapest emission reductions in the economy. While emissions trading attracts much popular attention, it represents only a small part of a bigger picture.

Stewart's work has involved assisting clients to understand the issues, manage risks and take advantage of the opportunities arising from industry and policy developments. This work has required the application of a

range of actuarial skills including discounted cashflow modelling, risk analysis and most importantly the application of clear, logical thinking.

Infrastructure Investment and Project Finance

The Australian market for infrastructure investment has demonstrated increasing levels of sophistication in recent years as governments have sought new ways of delivering infrastructure projects without accepting the risks and financial burdens implied by traditional methods of infrastructure procurement. Many projects in Australia have now been financed by methods that involve private sector finance and risk taking for a diverse range of assets that serve public infrastructure purposes including toll-roads, water treatment plants, private hospitals, airports, telecommunication cables, public transport and prisons. Financial modelling for infrastructure project financing and investment for such projects is very detailed and provides opportunities for actuaries skilled in cash-flow and scenario analysis. All such projects require an allocation of the risks involved between the parties and resolution of fundamental commercial tensions that always exist between the equity participants (who generally want limited recourse finance on optimal terms and maximum returns), the providers of debt (who want minimum risk) and the ultimate project user(s)(who want minimum costs of supply).

Projects of this type (eg, a toll-road) often have an uncertain revenue stream before they are built and actuaries are frequently called upon to assess various potential outcomes and assist in the design of the most effective financial structure using stochastic modelling tools so as to assess the probability of various possible outcomes for the project participants.

Actuaries working in all these emerging fields need to be able to:

- explain the importance of the main features of the general industry environment in Australia as they affect medium to long-term commercial decisions;
- assess the risks relevant to particular commercial situations and suggest how they may be handled;
- discuss alternative designs of contracts which may be suitable for providing protection to consumers in respect of a range of commercial risks;
- use financial models for decision making purposes, to gain an understanding of the dynamics of the situation so as to create a practical solution for the client's problem;
- discuss the assumptions that need to be used in the pricing and ongoing management of products;
- monitor and assess actual experience, assess future levels of solvency and identify the sources of any profit; and
- use the Control Cycle approach and actuarial techniques to tackle commercial problems.

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Conclusion

In reading the Presidential Addresses of many of the former Presidents of the IAAust as part of preparing this address, I found that almost all have concluded with an optimistic view of the future of the profession. Even as one who has pursued a somewhat unconventional actuarial career, I also share that view. In the current dynamic environment in which we all work, actuaries will be able to exploit emerging areas of opportunity if they do what actuaries do best - turn risk into value - and communicate this for stakeholders into present day implications, strategies and action.

Although the IAAust has a vital part to play in this process, it is ultimately up to the members of the profession to make it happen. Indeed, one of the best ways of predicting the future is to actively shape and create it.

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APPENDIX 1

International Prudential and Financial Reporting Regulatory Bodies

The international prudential and financial reporting regulatory regime is becoming increasingly complex and sophisticated. A short summary of the key organisations involved in international prudential regulation and financial reporting is set out below.

The Bank for International Settlements (BIS) is the world's oldest international financial organisation, formed in 1930 to facilitate German reparations after World War I, to promote central bank co-operation and provide additional facilities for international financial operations. Nowadays it is keenly involved in fostering international financial stability.

In 1974 the G10 central bank governors set up the Basel Committee on Banking Supervision and the BIS provides its secretariat. The Basel Committee has set standards for the supervision of international banking groups and their cross-border establishments and for minimum capital adequacy for banks. More recently it has issued the *Core Principles for Effective Banking Supervision*.

The International Organisation of Securities Commissions (IOSCO) was set up in the early 1970s so the securities commissions around the world could co-operate to promote high standards of regulation to maintain fair, efficient and sound markets. It has developed a set of *Objectives and Principles for Securities Regulation.*

The International Association of Insurance Supervisors (IAIS) was formed only in 1994 by insurance supervisors around the world to enhance international co-operation in the regulation of multinational insurance groups. It has issued principles, standards and guidance notes on issues related to insurance supervision after they have been adopted by its membership in annual conference. The first set of Insurance Supervisory Principles were adopted in September 1997 in Sydney. Since then it has also issued other principles and standards. It is not mandatory for IAIS members to comply with these principles and standards to be or remain IAIS members. However the IMF and World Bank are now assessing countries against these standards of good practice, so they are likely to eventually become virtual minimum standards.

The International Accounting Standards Committee is an independent private sector body formed in 1973 with the objective of harmonising the accounting principles which are used by businesses and other organisations for financial reporting around the world. It now has 153 professional accountancy body members from 112 countries. In July 1995 IOSCO and the IASC reached an agreement that if IASC completed the major components of a core set of accounting standards IOSCO would consider endorsing such International Accounting Standards for cross-border capital raisings and listing purposes in global markets.

The International Actuarial Association which has existed for many decades was restructured in 1998 to be an association of actuarial bodies from many countries, so that it could become the international voice of the actuarial profession. This body is active in insurance accounting and insurance regulation issues and has worked with the IASC and the IAIS.

The International Monetary Fund and the World Bank have, in the last few years, become more interested in the world financial regulatory architecture and they are now conducting assessments of various country's regulatory systems against the standards laid down by the Basel Committee, IOSCO and IAIS.

In 1996 the Joint Forum on Financial Conglomerates was set up under the aegis of the Basel Committee, IOSCO and the IAIS to progress work on information exchange between supervisors, enhancing supervisory co-ordination and developing principles for more effective supervision of financial conglomerates. It has produced papers on capital adequacy, fit and proper persons, information sharing, supervisor co-ordination, risk concentrations and intra-group transactions and large exposures. These are designed to assist in supervising emerging financial conglomerates and dealing with the blurring of distinctions between the activities of firms in each of the banking, insurance and securities sectors. The Joint Forum is now working on comparing the core principles of supervision applicable to each of the three sectors, transparency and disclosure issues and risk assessment and capital issues across the sectors. APRA is represented on the Joint Forum itself and on its working group on risk assessment and capital and is expected to consider and adapt initiatives from the Joint Forum.

APPENDIX 2

Framework Principles for the Australian Retirement Incomes System

It is recognised that providing financial security for older Australians encompasses a range of important issues including housing, health, retirement incomes and aged care. This document concentrates on the principles that apply to the provision of retirement incomes for Australians.

It is agreed that the following principles can be used to benchmark any policies or initiatives.

That the overall framework:

- adopts an integrated long-term approach to ensuring adequate and sustainable retirement income for all Australians;
- encourages an overall increase in national savings to enable sustainable economic growth and an internationally competitive economy;
- encourages a savings culture within the community through education and relevant fiscal and legal structures;
- provides an environment where those who are able, are encouraged to be self-reliant;
- recognises that considerable changes are occurring in labour markets, family structures and personal desires and so establishes a framework to maximise coverage, participation and saving for retirement on an equitable basis;
- is simple to understand;
- has an efficient and effective regulatory structure; and
- has the confidence of the Australian community and support from all major political parties.

That the overall framework for the provision of retirement income:

- maintains the diversified sources of funding for retirement as reflected in the current three pillar structure for retirement incomes of a means tested age pension, compulsory superannuation (the SGC) and voluntary superannuation/savings;
- encourages coherent integration between these three pillars;
- encourages the provision of retirement benefits, primarily in the form of income streams;
- is equitable between individuals, across lifetimes and between generations; and
- recognises the importance of disclosure for consumers and a robust consumer protection regime, together with consumer education.

That in respect of each pillar:

the age pension:

- is maintained as a safety net for all Australians at no less than its current level in real terms;
- continues to be funded from general taxation; and
- together with associated means tests, provides appropriate incentives for retirees to invest their financial resources and participate in the labour force.

the compulsory superannuation system:

- has as its objective the provision of retirement incomes;

- enables a level of compulsory contributions that both supplements the age pension and reduces the long term costs to Government of retirement income provision;

- has the broadest possible coverage and participation; and

- is sufficiently flexible to accommodate, after preservation age, both the payment of contributions and the receipt of benefits, as appropriate.

voluntary saving through superannuation and other vehicles:

- should be encouraged as part of the savings culture, with particular preferences given for medium and long term savings; and

- is flexible, recognising a range of individual life-cycle positions.

That the taxation of superannuation:

- ensures that superannuation is taxed in a manner that maintains community support and confidence and recognises the costs to individuals of its long term perspective and high level of preservation;

- should be designed to provide a clear incentive to save, preferably at the point of contribution, and have a focus on taxes on benefit payments, as this provides the simplest method of achieving equity, provides increasing revenue in future years and is consistent with international practice;

- is simple to understand; and

- can be operated transparently and efficiently. 

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