



Future risk

Defusing the demographic timebomb

Centenary Future Risk Series: Report 5

100
1912–2012
A CENTURY OF
PROFESSIONALISM



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Foreword

This year the Chartered Insurance Institute celebrates its centenary year as a chartered professional body. To mark this achievement, we are publishing a series of reports, each of which explores some of the risks and opportunities that might face us in the decades to come, drawing on the assessment of commentators across various fields of expertise.

Whilst ‘future gazing’ doesn’t always lead to accurate predictions, it is an important exercise for the insurance industry to undertake as understanding and assessing potential risks is at the heart of what we do. Indeed, central to the role of insurance is the ability to make informed, professional judgments about the relative risks of various hazards occurring over a particular period of time. By planning for the long-term and challenging assumptions about what the future might look like, the profession will be well placed to provide expertise and insight on the risks that lie ahead.

This report is the fifth in our centenary series and focuses on key demographic risk drivers including global ageing. Rising longevity is one of the most significant challenges we face as a society. Saving more for retirement is a particularly significant part of the solution but research such as the Scottish Widows Pensions Report 2012 continues to show that few are saving enough for later life. Within this report, six leading experts provide their views about risks related to future demographic trends, including global ageing, and how they can be addressed. Using this expert analysis, the report seeks to outline three possible scenarios and their potential implications for the insurance sector and beyond. We hope this penultimate report in the series, provides food for thought about some of the key insurance sector and public policy challenges facing us over the years ahead.



Robert Fletcher

Life and Pensions Faculty Chair

Introduction

Over the course of the last century, the world has experienced tremendous demographic change. Since 1960, the population has more than doubled from 3 billion to over 7 billion. This rate of growth is exceptional – over the course of human history, the world’s population has only grown very slowly if at all. The 1950s saw a baby boom and increasing life expectancy which led to a population surge – the world’s population grew at peak rates of 2% per annum in the 1960s. By 2005–2010 population growth had slowed, primarily due to falling fertility rates, yet it was still growing by 1.7% per annum.¹ That said, future population growth is not the only demographic trend likely to shape our world. Its distribution and concentration are also critical to understanding the challenges that lie ahead and this report will be particularly devoted to addressing these last two issues.

Global life expectancy has risen from 46 years of age in the 1950s to just under 70 today.² This is a major human achievement that should be celebrated, but it also poses a number of problems. First, if individuals continue to retire at the same age whilst life expectancy keeps rising, they will have to make greater provision for retirement during their working lives or face a significant drop in living standards during later life. Second, governments in many countries offer a safety net, stepping in to provide citizens with a minimum level of retirement income and healthcare, but assuming life expectancy keeps rising, payments linked to these areas are likely to continue growing. And third, increasing life expectancy is likely to mean that private pensions are paid out to an increasing number of people over a greater number of years. This poses a potential risk to the solvency of pension funds if age-related liabilities continue to creep up.

Understanding how governments, industries and individuals can work together to deliver adequate retirement incomes for the elderly against this demographic backdrop is set to be one of the key political and economic issues of our time. And it is not just relevant to the developed world. As this report will show, China, for example, is also ageing at an unprecedented rate, meaning that it too will have to confront these challenges in the not so distant future.

Exacerbating the problems associated with rising life expectancy is that in many parts of the world, coinciding with longer lives is falling fertility meaning that the distribution of tomorrow’s world is likely to be significantly skewed towards the elderly. This demographic shift could change the nature and composition of labour markets around the world with implications for productivity and economic growth. It may also change the nature of politics, with democratically elected governments increasingly likely to enact policies that please the ever growing proportion of older voters. But it is important to note that, not all of the world is ageing at the same rate. Some of the poorest parts of the world continue to have low life expectancy and high fertility. Fourteen countries have fertility rates of seven children per woman or higher.³ These tend to be the least well developed economically and are most prone to violent conflict hence they face a different set of demographic challenges and risks.

This latest report in the centenary series seeks to make sense of these demographic trends. Drawing from the expertise of six leading authors, this report unravels the types of risks stemming from global demographic change, and discusses what role the insurance industry can play in mitigating some of these risks and delivering a more secure and prosperous world in the face of them.

1 UN World Population Prospects

2 Ibid

3 Ibid

Overall approach to the Future Risk series

In early February we published the first in the centenary series – ***Future Risk: Learning from History***. It set the scene for the entire CII Future Risk series by reflecting on some of the most dynamic trends of the past and their potential implications as well as discussing some initial findings from a global survey into the risk perceptions of members of the public from across the globe.

A central point made by the report was that in such a rapidly changing international environment, it is vitally important to question underlying assumptions about the world around us and re-evaluate prevailing wisdom. We qualified this statement by noting that whilst a healthy level of scepticism about prevailing wisdom and future forecasting is a good thing, it should not prevent us from developing some scenarios on the long-term to help us prepare for some of the opportunities and risks that lie ahead. Rather, it should ensure that we do not become overly confident and dependent upon any single narrative. In this context, the fifth in our series of reports looks at some future demographic risk drivers and their implications for the insurance sector and society as a whole. Crucially it also seeks to identify what role the industry can play in incentivising a secure future in light of the projected demographic changes. Our next report will be the last in the series providing an overview of the insights and findings brought to light through all of the publications.

Summary

The report begins by presenting a number of **specially commissioned essays** on future socioeconomic risks from leading experts in the field. The authors and their topics include:

- **George Magnus**, former Chief Economist at UBS, focuses on the economic implications of global longevity trends at a time of continuing economic strife and what this means for asset managers.
- **Professor Jack Goldstone** of the George Mason School of Public Policy, discusses four demographic megatrends that will shape the world including international security.
- **David Bloom, Axel Börsch-Supan, Patrick McGee and Atsushi Seike**, consider ways in which governments and employers can mitigate some of the risks posed by rising longevity.
- **Angus Hanton**, co-founder of the Intergenerational Foundation, writes about the impending political and social tensions stemming from the degree to which the elderly are dependent on those of younger working age.
- **Jon Turney**, acclaimed science writer and author of *A Rough Guide to the Future*, investigates how far advances in biomedical science might increase life expectancy and improve cognitive ability.
- **Daniel Ryan**, Head of Life and Health Research and Development and **Ron Wheatcroft**, Technical Manager, Swiss Re, highlight ways to improve how the insurance industry models future longevity and how to stimulate increased savings amongst the general public.

Taken together, these essays represent compellingly argued visions of the future which can provide the basis for the construction of three illustrative scenarios – all of which have important **implications for the insurance sector and beyond**.

In the **upside scenario**, due to the choices made by governments, insurers and employers, global ageing is not the source of the next sovereign debt crisis, or financial sector scandal. Governments are able to reduce the burden of age-related spending through reforms to state pension age and the re-skilling of the labour force, whilst insurers are able to provide their clients with adequate sources of income in retirement through improvements in modelling longevity risk and communications with consumers. Managing personal finance becomes as routine as the “weekly shop” buttressed by the efforts of employers to encourage a savings culture amongst staff.

In the **central scenario**, there is mixed success in terms of mitigating the risks of an ageing developed world. Reforms to pension age help to reduce the future burden on public spending but not enough progress is made on re-skilling the labour force to ensure that ageing is not a significant drain on government resources. And this is exacerbated by the fact that occupational pension saving remains subdued – deterred by the failure of the industry and other stakeholders to fully engage consumers and provide adequate protection from financial market risks. Pensioners are therefore worse off than in our best case scenario and so are governments.

In our **downside scenario**, the developed world experiences increasing government debt as a consequence of failing to address rising longevity. Government inaction is not solely to blame for this situation. As a result of the insurance industry failing to adequately understand longevity risk, insurers are unable to price this risk appropriately and offer their customers a fair deal. This seriously damages confidence in the industry and the ability of the private sector to take on some of the burden as the public sector seeks to limit its exposure to risks related to demographic change. In turn, the developed world’s growing fiscal predicament coupled with failures to reform international governance to accommodate the growing power of the world’s younger, vibrant economies, results in increased international tension.

The report concludes by calling for a **“New Deal” for providing for the elderly**, which includes consistent and predictable government and regulatory policy, and increased competence and transparency across the insurance industry. And to succeed, the deal must have real buy-in from all stakeholders, at all levels of society. It will be a hard bargain to strike and to commit to, but without it, governments across the developed world risk becoming the “zombie banks” of the next 100 years, only remaining solvent because they are shored up by credit from increasingly impatient developing world economies who will themselves grow older and less able (or willing) to bankroll the West.

Past trends and possible futures

Our report begins with a series of essays outlining some of the key global demographic trends and their broad implications, both in terms of economic activity and international security. It then introduces some analysis of the factors that are likely to underpin future rises in longevity and how financial services, and particularly insurance, may be able to mitigate the risks posed by demographic change. This section concludes by referring to some of the key findings of a Geneva Association report into global ageing published earlier in 2012.

Age, the economy and international security

In our first essay, **George Magnus, former Chief Economist at UBS Investment Bank** focuses on the ways in which increasing life expectancy is “colluding” with the crisis in economic growth to create serious shortcomings in the adequacy of retirement incomes, and how fiscal deficits make solving the challenge of age related spending even more pertinent.

Magnus predicts that over the next forty years, the over 60s will rise from 759 million to 2 billion, equivalent to a rise in their share of the population from 22% to 33% in advanced nations, and from 9% to 20% in emerging nations. Magnus argues that the speed at which the global population is ageing may be problematic, especially for emerging countries since they have lower GDP per capita and provide less social security. In addition, an ageing population means that there are likely to be proportionally fewer workers to finance the elderly. Magnus refers to the prediction that by 2050 there will be 2 or fewer working age adults for every older citizen.

As well as posing a fundamental macroeconomic problem in terms of productivity, Magnus also highlights that rising life expectancy and the current economic climate also threaten the adequacy of retirement saving. But since public debt as a proportion of GDP is increasing, this limits the spending that governments can make to plug any shortfalls in an individual’s provision for retirement. He concludes by outlining some of the actions that can be taken by government and financial institutions to improve retirement prospects; for example, he says that, *“asset managers must develop products that maintain financial exposure to equities and other risk products for longer, while controlling for the market volatility that older savers especially need to avoid”*.

Professor Jack Goldstone, of the George Mason School of Public Policy also discusses our global demographic future, covering in detail four “megatrends” that could change the world. These include: the decline of Europe in terms of its proportion of the global population and economic productivity, the “ageing pains” of the developed world, the bulge of youthful populations in parts of the developing world and mass urbanisation in youthful societies.

Professor Goldstone argues that these trends could have significant implications for international security. In particular he is concerned that the West is growing older just at a time when there is a bulge in the numbers of young people in certain developing countries – especially the Middle East. Some of these countries are economically weak, unable to provide employment to their young, fast growing populations. Exacerbating the problem is urbanisation which, Goldstone thinks, may provide another destabilising force. He says *“according to the research of Richard Cincotta and other political demographers, countries with younger populations are especially prone to civil unrest and are less able to sustain democratic institutions. And the more heavily urbanised, the more such countries are likely to experience poverty and anarchic violence.”* But political risk is not just related to the propensity for internal conflict and instability. Goldstone also argues that the combination of youth, poverty and urbanisation is acting to increase the degree to which some Middle Eastern countries are antagonistic towards the West and the US in particular.

Goldstone believes that sweeping changes to global governance are needed. International institutions must become more accommodating to the views of fast-growing and economically dynamic countries. *“The G-8 for example, will likely become obsolete as a body for making global economic policy. The G-20 is already becoming increasingly important, and this is less a short term consequence of the ongoing financial crisis than the beginning of the necessary recognition that Brazil, China, India, Indonesia, Mexico, Turkey and others are becoming global economic powers”.*

Angus Hanton, of the Intergenerational Foundation also views rising life expectancy as a potential threat to political stability. As the burden of looking after the elderly increases through the rising costs of pensions, housing, medical costs and long-term care, this has a direct influence on the well-being of the younger generation threatening to cause increasing tensions between the generations. Hanton argues that there is a danger that the young may well react negatively to seeing their disadvantages being “locked in” especially if their well-being deteriorates further. Indeed, the author believes that tensions between young and old were apparent during the 2011 “Arab Spring” and in the August 2011 riots.

According to Hanton, the outlook for young people may slightly improve as a consequence of two long-term trends – rising inflation and, in particular, labour shortages. With respect to the latter, Hanton argues that: *“as the working population becomes smaller [due to population ageing], workers should be able to increase their real wages and win back some economic benefits from an older generation in need of services and care”.* Hanton also argues that young people should seek to organise themselves politically – using the ballot box to change their prospects, though he thinks that this will be a challenge given the growing proportion of elderly voters.

Hanton believes that the Government should implement a number of policy measures to ensure intergenerational fairness. These include (amongst others); employment and tax policies that are “youth friendly”, fairer sharing of the costs associated with paying for the elderly and significant incentives for elderly people to downsize their properties or take in tenants.

What else can government and employers do?

In their contribution to this report, **David Bloom, Axel Börsch-Supan, Patrick McGee and Atsushi Seike**, discuss some of the myths associated with global ageing. The authors argue that future labour force participation rates might not be as concerning as some make out. They point out that the future increase in elderly dependants is likely to be offset by a decline in youth dependants as fertility rates fall. This offset suggests that *“population ageing may not pose an imminent economic crisis for the world”*, though the authors do not deny that an ageing world poses great challenges. Indeed, Bloom et al argue that government spending is likely to be put under pressure by a *“tidal wave of non communicable diseases such as cancer, diabetes and heart disease”* and publicly funded pension schemes will also act as a drain on government resources.

In response to these challenges, governments and businesses have a number of possible options. On the public policy side, governments can take action to remove incentives to retire between 60 and 65. This might include, adjusting tax and benefit policies or removing mandatory retirement ages, and banning maximum hiring ages. And perhaps the most obvious government policy measure is raising the overall retirement age. Bloom et al note that in the example of Japan, raising the eligible pension age from 60-65 increased the labour force participation rate from 71% in 2006 to 77% in 2009. The authors also note that increased immigration would be helpful though they qualify this statement by admitting that *“huge numbers of immigrants would be necessary to compensate for population ageing”*.

On the business side, the authors argue that, to begin with, attitudes must change: “...in an economy where knowledge rules, the experience of older workers grows in value, and they can serve as role models for younger workers”. In time, employers should allow more part-time work and telecommuting to entice the older workers to stay on whilst ongoing training will be necessary to help older workers “master new skills as the economy changes”. The authors also recommend that businesses move to performance based, as distinct from seniority based pay, which they believe would lead to a “relaxation of corporate norms surrounding age at retirement”.

Factors underpinning rising longevity and the role of financial services

In his contribution, acclaimed science writer, **Jon Turney**, predicts a transformation in life expectancy and cognitive ability, resulting from the increased use of complex technology alongside the development of biology.

Turney predicts that through advances in bioscience, over the next century, it is plausible that 1 person in every 100 could reach 110 years old, instead of 1 person in a billion today. He argues that “a treatment to ensure this, whether an intermittent removal of cellular garbage or a continual boost to the damage control systems of the cell, ought not to involve radical biological novelty...Even if it only works properly for people born after it is introduced, rather than undoing the damage already invisibly affecting 50 year-olds, it would have startling effects.” In this context he believes that the “painful adjustments we are beginning to make now to pension financing as life expectancy creeps into the 80s and 90s are a simple example of larger issues to come”. Turney also argues that further increases in life expectancy will increase social and economic inequalities, between those that can get access to the latest medical advances to extend life, and those that cannot.

But scientific advances will not just increase life expectancy. Turney believes that they may also improve cognitive ability. Turney writes; “some forecasters envisage an array of brain-active drugs which, in the right combinations, would enhance mood, attention, sensory acuity, and memory, if not yet actual understanding. Used in the right combinations, such drugs could enhance learning by making more efficient use of study time, and aiding retention”. Whilst this may provide obvious benefits, particularly to individuals whose work requires continual learning, Turney thinks there may be dangerous trade-offs – “attempts at enhancement of a complex system [such as the human brain] which is poorly understood can easily stumble over the annoying fact that you can have too much of a good thing”.

In this report’s final essay, **Daniel Ryan** and **Ron Wheatcroft of Swiss Re**, also consider longevity trends and carefully describe some of the factors underpinning recent improvements such as innovations in medicine and the increased understanding of lifestyle risks such as smoking and diet.

The authors argue that in order to predict future longevity it is necessary to take a multi-disciplinary approach involving many stakeholders. These include actuaries, medical experts, epidemiologists, pharmacologists, demographers and gerontologists. And the authors note the importance of national statistics alongside more extensive sources of information that can provide full patient medical details capturing the history of investigation, diagnosis and treatment.

An example of this is the General Practice Research Database which has details of over 5 million patients in the UK. Using this data it is possible to build a disease “mosaic” which “identifies patterns of individual disease co-morbidity by age and gender”. From this information it is possible to create different forward looking scenarios which describe how future changes may impact upon life expectancy, such as introducing professional guidelines into clinical medical practice. But crucially the authors argue that the scenarios must be “realistic about how far in the future we can make informed predictions for individual diseases”.

Moreover, the authors argue that a forward looking mortality model is just part of the solution to pricing and funding future retirement income. In their view there need to be better methods to share the risk of longevity between customers, pension funds, insurers and governments. And there must be improved communication and marketing to customers. The authors argue that *“if consumers are to move from having greater awareness of their responsibilities to the next step, taking action, clear unequivocal messages will be essential – not least from government. Many reports have shown the low level of financial capability in the UK. Clarity is, therefore, key if this is ever to change”*.

Key findings from the Geneva Association report into global ageing⁴

Earlier in 2012, the Geneva Association undertook its own investigation into global ageing. A key theme running throughout its report was the so called “four pillars” of a pensions system, a framework for thinking about pensions that has gained traction in recent times. The pillars include:

1. A state pension to meet basic needs.
2. A private occupational pension.
3. Voluntary individual savings.
4. Part-time post retirement work.

The report argues that with state pensions being reigned in, and occupational schemes less generous and less predictable, pillars 3 and 4 are set to become increasingly important and will need to be “strengthened markedly”. In the authors’ view insurers have a clear role here. They are in a *“unique position to enhance pillar 3 (savings) by a transfer of longevity risk. Insurers also have the skills and experience to design (innovate) products specifically catering to those who opt to work beyond formal retirement age [pillar 4]”*.

One of the report’s authors, Kai-Uwe Schanz, Special Advisor Strategic Research at The Geneva Association argues that *“longevity risk presents the insurance industry with massive opportunities [...] Biometric risk being a core business for life insurers, the industry clearly has the expertise, skills, data and diversification to address longevity risk”*.

He concludes by arguing that in order to enhance the role of insurers in helping societies manage longevity risk, *“insurers should support the development and design of innovative risk mitigation solutions, optimise product pricing and design, rethink existing business models (in particular if they focus on financial market risk protection) and educate the public on the cost of longevity”*.

Schanz also emphasises the importance of employers regarding the implementation of pillar 2 (occupational pension schemes) and pillar 4 (post retirement work). He argues that employers must *“make retirement and pension issues a cornerstone of employee communication and communicating firmly and openly on what the company can afford and, last but not least, capturing the potential of ‘silver workers’”*.

Building scenarios on the future

The expert analysis outlined above provides an indication of the kinds of risks posed by demographic change. The insurance industry can play a role in mitigating many of these risks, and in particular those associated with rising longevity. Later in this report, we set out three possible future scenarios and their implications for insurance and financial services. They examine how the world might look under different sets of policy decisions (national and international) and given different types of action by financial services firms and practitioners.

⁴ The Geneva Reports: Risk and Insurance Research, “Addressing the challenge of global ageing – funding issues and insurance solutions”, eds. Patrick M. Liedtke and Kai-Uwe Schanz, (June 2012)

Global longevity trends and their potential economic and social implications⁵

George Magnus, Independent Economist and Adviser to UBS and author of the “Age of Ageing” (2008)⁶, and “Uprising: will emerging markets shape or shake the global economy?” (2010)

According to the Global Ageing report 2010 from rating agency, Standard and Poors’, “No other force is likely to shape the future of national economic health, public finances, and national policies as the irreversible rate at which the world’s population is growing older”.

No one disagrees global ageing is having, and will continue to have, profound consequences, as suggested. But ‘no other force’ seems a little over the top. The global system, and our societies are facing their biggest challenges in peacetime perhaps since the Industrial Revolution as a result of the rise of China and other emerging and developing countries. And the protracted and fractious consequences of the financial crisis for the economic, social and regulatory environment certainly qualify as ‘game-changers’. Who knows for how long Western countries are going to have to deleverage their economies, or what the multi-year consequences will be? And how can we predict what Europe is going to look like in the next few months, let alone in the longer-term? These phenomena will shape the future too, but with even less certainty, and much less predictable consequences, than global ageing, itself.

Demographic dynamics

In advanced economies, the crossover between the number of people aged over 60 and those aged under 14 as a share of the population was reached about 10 years ago. By 2050, there will be twice as many older citizens as there are children. By contrast, in emerging countries, there are still three times as many children as there are older citizens and the crossover is not predicted to happen until 2040. There are some notable exceptions, where age structure is changing extremely rapidly, almost on a par with the West, including in China, Russia and Eastern Europe.

By 2050, the number of over 60s in advanced nations is expected to rise by 2.5 times to around 418 million, and the number of over 80s will rise 6 times to over 120 million. In the emerging world, the number of over 60s will grow by more than 3 times to 1.4 billion, and this includes a 6-fold increase in the expected population of those aged over 80, to 262 million. Altogether, the over 60s will rise from 759m to 2 billion, equivalent to a rise in their share of population from 22% to 33% in advanced nations, and from 9% to 20% in emerging nations.

The most astounding feature of global ageing nowadays is its speed. It took France over a century for the over 60s to double from 7% to 14% of the population. In most other developed countries it has taken, or is taking, between 40–80 years. But most emerging nations will accomplish this shift in roughly 20 years, with China already the fastest ageing country on Earth. Its population of over 60s will grow from 144 million or 11% of the population, to 438 million or 31% by 2050. Some cities, for example, Shanghai, already have an age structure similar to that of Japan, which is the oldest Western country.

“The most astounding feature of global ageing nowadays is its speed. It took France over a century for the over 60s to double from 7% to 14% of the population...but most emerging nations will accomplish this shift in roughly 20 years.”

⁵ Based on an address to the 7th Chief Risk Officer Assembly, Swiss Re, Zurich, 16th November 2011. This essay was also included within an earlier report within the Centenary series: *Future Risk: Social and Economic Challenges for Tomorrow*

⁶ <http://georgemagnus.com/books/the-age-of-ageing-how-demographics-are-changing-the-global-economy-and-our-world>

The problem for China and other emerging countries is that they are starting to encounter the longevity challenge at levels of per capita income and social security provision that are substantially lower than was the case for Western nations when they had a similar median age and other demographics to those of emerging markets today.

The challenge of rising longevity is a darker prospect than the traditional perspective which celebrates longer life expectancy as self-evidently good. The reason is because of the economic implications of the collapse in, and sustained low levels of, fertility. Put another way, there are not enough babies being born to become the workers who will support and finance the rising population of older citizens. In most advanced countries, the 3–4 working age people per older citizen will become 2 or less by the middle of the century, while in China, for example, the 10 workers who support each older citizen will become just 2.5.

It is the implied change in age structure, that is, the soaring numbers of older citizens in relation to working age people, that is the root of the problem, and boils down to the fundamental economic problem of a stagnant or diminishing labour supply, and skill shortages. Boeing's senior vice-president of human resources, for example, told an audience in 2010 that by 2015, 40% of the aircraft maker's workers would be eligible to retire. Recruitment and staff retention are becoming a major problem for a growing number of businesses, as evidenced in recent times by announcements at Siemens and BMW, and, therefore, for the economy. In the US, about 19% of US manufacturing workers are aged 54 or more, which is roughly the same as for the workforce as a whole. But only 7% of manufacturing workers are under 25, which is half that of the total workforce.

“With Western countries having already banked their [demographic] dividend, the headwinds to these benefits are going to gather inexorably, unless we can find new coping mechanisms to address the shortfalls in labour supply and skills.”

From an economic perspective, the significant change, then, is on the coming crunch in the working age population, and on the payback from what demographers call the 'demographic dividend'. This is the phase during which child dependency is declining, and the working age population is expanding from prior higher fertility rates, but before rising old age dependency kicks in. It is where advanced countries were for much of the post-WW2 era until a few years ago, and where most emerging countries are now. This dividend is associated with strong trends in income and consumption growth, increasing asset market development and asset returns, and economic expansion. With Western countries having already banked their dividend, the headwinds to these benefits are going to gather inexorably, unless we can find new coping mechanisms to address the shortfalls in labour supply and skills.

The collusion of rising longevity and the financial crisis

From a financial markets' standpoint, the crisis has cemented a low interest rate environment, weaker equity returns, and a worrying uncertainty as to what constitutes a risk-free rate, all in the context of more stringent regulation, and increasingly of financial repression, that is, policies designed to ensure that domestic investors continue to fund government deficits.

But demographic change does some of these things too, as suggested already by Japan's experience with ageing over the last 22 years. After all, as the age structure of society rises, more and more people move out of productive work into retirement, but are not being replaced because of weak fertility rates. This tends to shift income distribution from capital to labour, underpinning weaker equity returns. Or, as now, it causes companies to continuously look for labour cost savings, which in turn, depress aggregate demand with similar consequences. In a macabre way, we could argue that rising longevity and other demographic factors are colluding with the crisis over economic growth to create serious shortcomings in the adequacy of individual retirement funding and of private pension and insurance schemes, and in sovereign solvency, given both existing budgetary conditions and the unaffordability of public age-related spending, based on existing commitments.

“ In a macabre way, we could argue that rising longevity and other demographic factors are colluding with the crisis over economic growth to create serious shortcomings in the adequacy of individual retirement funding. ”

It is possible that financial services companies could play an important role in developing new savings and insurance products that will help the growing numbers of retirees meet their changing financial needs, and providing pension and related services as financially stretched governments pass financial provision and care responsibilities back to individuals.

Financial products and services demanded by individuals, for example, will continue to shift from those that accumulate savings during working lives to those that facilitate their draw-down during ever longer years of retirement and old age care. The longevity phenomenon is changing the standard life-cycle hypothesis that lies at the heart of things we have taken for granted in financial services for a long time, including patterns of savings behaviour and lifestyle financial products. Put another way, rising life expectancy, longer years at work, and perhaps as much as 20 years or more in retirement require people to retain at least some exposure to risk assets for longer than has been the case until recently. Evidence for the Federal Reserve's four-yearly Survey of Consumer Finances confirms that households, headed by older citizens, continue to have more conservative asset allocations than their younger peers, but retain higher levels of risk exposure than their predecessors. Asset managers will have to develop products that maintain financial exposure to equities and other risk products for longer, while controlling for the market volatility that older savers especially need to avoid.

“ Asset managers will have to develop products that maintain financial exposure to equities and other risk products for longer, while controlling for the market volatility that older savers especially need to avoid. ”

There are ways in which governments can also mitigate the consequences of rising longevity for the economy. Immigration is an obvious example, except for the fact that for the time being, the politics are hostile – and in the case of most European countries and Japan, the scale of immigration needed to compensate for the effects of rapid ageing is unimaginable in practice. Other mechanisms are about keeping and bringing into work people whose participation rates in the work force is low, specifically older workers, and women.

Keeping older workers at work and enticing more into some form of work cannot be addressed by age discrimination legislation alone. Other than in Japan, where high older worker employment rates are the norm (but not for women), this requires governments and citizens to take a realistic view about the ability to work longer. To an extent, this is already evident in the spate of policies designed to raise the retirement age in steps or align it with longevity, or to raise other eligible ages for access to pension and healthcare benefits.

Governments are now raising retirement ages either because they are forced to do so under IMF programmes or because they are self-imposed for reasons of financial duress. But even higher retirement ages won't solve the longevity problem totally. This will require a comprehensive shift in thinking about the nature and flexibility of work and the workplace, the introduction of phased retirement schemes, new occupational and compensation structures to suit older workers, and a strong commitment to life-long skill formation and retraining.

“But even higher retirement ages won't solve the longevity problem totally. This will require a comprehensive shift in thinking about the nature and flexibility of work and the workplace.”

The position of women in ageing societies will become increasingly significant. It is worth emphasising that the demographic challenge is less in countries that have higher fertility, and it is no accident that countries, such as the US, Canada, the UK and Sweden that have higher fertility rates also have the highest proportions of women at work. This is essentially, of course, about affordable and widely available systems of child care. But higher female participation in the labour force is also about systems that better protect younger women, who head up the vast majority of single parent families, and all women to the extent that they tend to dominate part-time and less well paid work, and are at risk from financial penalties associated with career breaks, having children and getting divorced.

It should be noted also that because of greater female longevity, the female proportion of the older citizen age group is going to rise, and women are typically disadvantaged compared to men, especially if they live alone, and as they grow older. In the UK, about a third of women aged over 55 have no retirement savings at all, and of those that do, over half have nowhere nearly adequate provision.

Inadequacy of retirement savings, however, is a common problem. The consequences of falling house prices, low interest rates, and weak equity markets aside, insufficient retirement savings were a cause for concern before the financial crisis. In the US just before 2008, the Federal Reserve found that 60% of households in the bottom third of the income distribution had insufficient savings for retirement, and almost 50% of the middle third and 42% of the top third were in a similar position. These numbers are bound to have risen with higher unemployment and weaker economic and stock market conditions.

A massive issue arising from rising longevity in current circumstances is precisely how older workers can save for retirement, especially if they are struggling with too much debt or unaffordable mortgages, but generally when interest rates are at generational lows and equity returns are meagre and volatile. This applies in particular to those not covered by private pension plans, or relying on pay-as-you-go pension systems. Only 6 countries accounted for the vast majority of the \$31 trillion in pension assets at the end of 2010. They were the US with a 63% share, the UK (9%), and Canada, Japan, the Netherlands and Australia (17%). Some countries, such as Denmark, Switzerland, and Finland had high pension assets as a share of their own GDP, as did Chile and Korea. But in much of Europe, including Spain and France, as indeed in much of the emerging country universe, pension assets are small by comparison.

Public sector savings, or the lack of them, are now the focus of attention on an unprecedented scale in Western countries. The rise in the ratio of public debt to GDP to well over 100% that we have seen since 2008 is indeed unprecedented in peacetime. Most governments face many years of deleveraging, or restructuring their fiscal balances and policies, so as to stabilise and then lower the public debt burden. Some, such as Greece, Ireland, and Portugal face insolvency risks that have shut down their access to private markets, and forced them into IMF programmes. We cannot know how this sovereign crisis is going to end up, especially in the Eurozone, not least because solutions are heavily dependent on the political willingness and capacity of governments and citizens to deal with the consequences. Suffice to say, that the scale of the task is enormous. The net present value of age-related spending over the next 40 years in advanced nations is roughly 5 times their 2010 GDP.

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Conclusion

Rising longevity conveys a standard fare for actuaries, demographers and pension fund consultants. It only sounds threatening in a financial sense for pension plan providers and beneficiaries. In a wider context, though, it is also about broad-based financial security in societies experiencing an unprecedented rise in age structure. It is about fault lines in the way our economies work. And it is, pressing, about the financial viability and possible solvency of governments, entailing a politically fractious debate about the redrawing of entitlement rights and responsibilities of citizens and the state. And these are just some of the economic consequences. There are social implications too for public policy as it applies, for example, to immigration, education, and care in the community, and for families, as yesterday's two generation family structures with siblings and cousins become multiple so-called 'beanpole' families.

“After a period in which banks and financial service providers, among others, have been pilloried for their role in creating the crisis, it would be fitting indeed if the industry played a strong role in devising at least some of the answers to the challenges posed by rising longevity.”

We have to find new coping mechanisms in the creation of jobs, especially for women and older workers, in the way we think about the nature of work, the work place and retirement, and in the systems that encourage people to save more for retirement and allow them to manage their savings for the decade or two in which they spend their twilight years. The financial crisis has certainly retarded the process, and aggravated the economic consequences of rapid societal ageing. After a period in which banks and financial service providers, among others, have been pilloried for their role in creating the crisis, it would be fitting indeed if the industry played a strong role in devising at least some of the answers to the challenges posed by rising longevity.

Four demographic megatrends to change the world⁷

Jack A. Goldstone, Virginia E. and John T. Hazel, Jr., Professor at the George Mason School of Public Policy, and Senior Fellow at the Mercatus Center and the Brookings Institution

There are four historic shifts that will fundamentally alter the world's population over the next four decades: the relative demographic weight of the world's developed countries will drop by nearly 25%, shifting economic power to the developing nations; the developed countries' labour forces will substantially age and decline, constraining economic growth in the developed world and raising the demand for immigrant workers; most of the world's expected population growth will increasingly be concentrated in today's poorest, youngest, and most heavily Muslim countries, which have a dangerous lack of quality education, capital, and employment opportunities; and, for the first time in history, most of the world's population will become urbanised, with the largest urban centres being in the world's poorest countries, where policing, sanitation, and health care are often scarce. Coping with these trends will require nothing less than a major reconsideration of the world's basic global governance structures.

1. Europe's reversal of fortunes

At the beginning of the eighteenth century, approximately 20% of the world's inhabitants lived in Europe (including Russia). Then, with the Industrial Revolution, Europe's population boomed, and streams of European emigrants set off for the Americas. By the eve of World War I, Europe's population had more than quadrupled. In 1913, Europe had more people than China, and the proportion of the world's population living in Europe and the former European colonies of North America had risen to over 33%.

But this trend reversed after World War I, as basic health care and sanitation began to spread to poorer countries. In Asia, Africa, and Latin America, people began to live longer, and birth-rates remained high or fell only slowly. By 2003, the combined populations of Europe, the United States, and Canada accounted for just 17% of the global population. In 2050, this figure is expected to be just 12% — far less than it was in 1700. (These projections, moreover, might even understate the reality because they reflect the “medium growth” projection of the UN forecasts, which assumes that the fertility rates of developing countries will decline while those of developed countries will increase. In fact, many developed countries show no evidence of increasing fertility rates while growth rates in many developing nations are remaining stable or even rising.)

“The portion of global GDP produced by Europe, the United States, and Canada in 2050 will then be less than 30% — smaller than it was in 1820.”

The West's relative decline is even more dramatic if one also considers changes in income. The Industrial Revolution made Europeans not only more numerous than they had been but also considerably richer per capita than others worldwide. According to the economic historian Angus Maddison, Europe, the United States, and Canada together produced about 32% of the world's GDP at the beginning of the nineteenth century. By 1950, that proportion had increased to a remarkable 68% of the world's total output (adjusted to reflect purchasing power parity).

⁷ This is an abridged and updated version of an article first published for Foreign Affairs – The New Population Bomb: The Four Megatrends that Will Change the World. Adapted with permission of FOREIGN AFFAIRS, (January/February 2010). Copyright (2010) by the Council on Foreign Relations, Inc. www.ForeignAffairs.com

This trend, too, is headed for a sharp reversal. The proportion of global GDP produced by Europe, the United States, and Canada fell from 68% in 1950 to 47% in 2003 and will decline even more steeply in the future. If the growth rate of per capita income (again, adjusted for purchasing power parity) between 2003 and 2050 remains as it was between 1973 and 2003—averaging 1.68% annually in Europe, the United States, and Canada and 2.47% annually in the rest of the world—then the combined GDP of Europe, the United States, and Canada will roughly double by 2050, whereas the GDP of the rest of the world will grow by a factor of five. The portion of global GDP produced by Europe, the United States, and Canada in 2050 will then be less than 30%—smaller than it was in 1820.

“...the developing world’s middle class alone will be larger than the total populations of Europe, Japan, and the United States combined. From now on, therefore, the main driver of global economic expansion will be the economic growth of newly industrialised countries, such as Brazil, China, India, Indonesia, Mexico and Turkey.”

These figures also imply that an overwhelming proportion of the world’s GDP growth between 2003 and 2050—nearly 80%—will occur outside of Europe, the United States, and Canada. By the middle of this century, the global middle class—those capable of purchasing durable consumer products, such as cars, appliances, and electronics—will increasingly be found in what is now considered the developing world. The World Bank has predicted that by 2030 the number of middle-class people in the developing world will be 1.2 billion—a rise of 200% since 2005. This means that the developing world’s middle class alone will be larger than the total populations of Europe, Japan, and the United States combined. From now on, therefore, the main driver of global economic expansion will be the economic growth of newly industrialised countries, such as Brazil, China, India, Indonesia, Mexico and Turkey.

2. Ageing pains

Part of the reason developed countries will be less economically dynamic in the coming decades is that their populations will become substantially older. In 2050, approximately 30% of Americans, Canadians, Chinese, and Europeans will be over 60, as will more than 40% of Japanese and South Koreans.

Over the next decades these countries will have increasingly large proportions of retirees and increasingly small proportions of workers. As workers born during the baby boom of 1945–65 are retiring, they are not being replaced by a new cohort of citizens of prime working age (15–59 years old). Industrialised countries are experiencing a drop in their working-age populations that is even more severe than the overall slowdown in their population growth. South Korea represents the most extreme example. Even as its total population is projected to decline by almost 9% by 2050 (from 48.3 million to 44.1 million), the population of working-age South Koreans is expected to drop by 36% (from 32.9 million to 21.1 million), and the number of South Koreans aged 60 and older will increase by almost 150% (from 7.3 million to 18 million). By 2050, in other words, the entire working-age population will barely exceed the 60-and-older population. Although South Korea’s case is extreme, it represents an increasingly common fate for developed countries. Europe is expected to lose 24% of its prime working-age population (about 120 million workers) by 2050, and its 60-and-older population is expected to increase by 47%. In the United States, where higher fertility and more immigration are expected than in Europe, the working-age population will grow by 15% over the next four decades — yet that is still a steep decline from its growth of 62% between 1950 and 2010. And by 2050, the United States’ 60-and-older population is expected to double.

“The forces that fuelled economic growth in industrialised countries during the second half of the twentieth century—increased productivity due to better education, the movement of women into the labour force, and innovations in technology—will all likely weaken in the coming decades.”

All this will have a dramatic impact on economic growth, health care, and military strength in the developed world. The forces that fuelled economic growth in industrialised countries during the second half of the twentieth century—increased productivity due to better education, the movement of women into the labour force, and innovations in technology—will all likely weaken in the coming decades. College enrolment boomed after World War II, a trend that is not likely to recur in the twenty-first century; the extensive movement of women into the labour force also was a one-time social change; and the technological change of the time resulted from innovators who created new products and leading-edge consumers who were willing to try them out—two groups that are thinning out as the industrialised world’s population ages.

Overall economic growth will also be hampered by a decline in the number of new consumers and new households. When developed countries’ labour forces were growing by 0.5–1.0% per year, as they did until 2005, even annual increases in real output per worker of just 1.7% meant that annual economic growth totalled 2.2–2.7% per year. But with the labour forces of many developed countries (such as Germany, Hungary, Japan, Russia, and the Baltic states) now shrinking by 0.2% per year and those of other countries (including Austria, the Czech Republic, Denmark, Greece, and Italy) growing by less than 0.2% per year, the same 1.7% increase in real output per worker yields only 1.5–1.9% annual overall growth. Moreover, developed countries will be lucky to keep productivity growth at even that level; in many developed countries, productivity is more likely to decline as the population ages.

“...just as ageing developed countries will have proportionally fewer workers, innovators, and consumerist young households, a large portion of those countries’ remaining economic growth will have to be diverted to pay for the medical bills and pensions of their growing elderly populations.”

A further strain on industrialised economies will be rising medical costs: as populations age, they will demand more health care for longer periods of time. Public pension schemes for ageing populations are already being reformed in various industrialised countries—often prompting heated debate. In theory, at least, pensions might be kept solvent by increasing the retirement age, raising taxes modestly, and phasing out benefits for the wealthy. Regardless, the number of 80- and 90-year-olds—who are unlikely to work and highly likely to require nursing-home and other expensive care—will rise dramatically. And even if 60- and 70-year-olds remain active and employed, they will require procedures and medications—hip replacements, kidney transplants, blood-pressure treatments—to sustain their health in old age. All this means that just as ageing developed countries will have proportionally fewer workers, innovators, and consumerist young households, a large portion of those countries’ remaining economic growth will have to be diverted to pay for the medical bills and pensions of their growing elderly populations. Basic services, meanwhile, will be increasingly costly because fewer young workers will be available for strenuous and labour-intensive jobs.

3. Youth in the developing world

Even as the industrialised countries of Europe, North America, and Northeast Asia will experience unprecedented ageing this century, fast-growing countries in Africa, Latin America, the Middle East, and Southeast Asia will have exceptionally youthful populations. Today, roughly nine out of ten children under the age of 15 live in developing countries. And these are the countries that will continue to have the world's highest birth-rates. Indeed, over 70% of the world's population growth between now and 2050 will occur in 24 countries, all of which are classified by the World Bank as low income or lower-middle income, with an average per capita income of under \$3,855 in 2008.

Many developing countries have few ways of providing employment to their young, fast-growing populations. Would-be labourers, therefore, will be increasingly attracted to the labour markets of the ageing developed countries of Europe, North America, and Northeast Asia. Youthful immigrants from nearby regions with high unemployment—Central America, North Africa, and Southeast Asia, for example—will be drawn to those vital entry-level and manual-labour jobs that sustain advanced economies: janitors, nursing-home aides, bus drivers, plumbers, security guards, farm workers, and the like. Current levels of immigration from developing to developed countries are paltry compared to those that the forces of supply and demand might soon create across the world.

These forces will act strongly on the Muslim world, where many economically weak countries will continue to experience dramatic population growth in the decades ahead. In 1950, Bangladesh, Egypt, Indonesia, Nigeria, Pakistan, and Turkey had a combined population of 242 million. By 2009, those six countries were the world's most populous Muslim-majority countries and had a combined population of 886 million. Their populations are continuing to grow and indeed are expected to increase by 475 million between now and 2050—during which time, by comparison, the six most populous developed countries are projected to gain only 44 million inhabitants. Worldwide, of the 48 fastest-growing countries today—those with annual population growth of two percent or more—28 are majority Muslim or have Muslim minorities of 33% or more. It is, therefore, imperative to improve relations between Muslim and Western societies. This will be difficult given that many Muslims live in poor communities vulnerable to radical appeals and many see the West as antagonistic and militaristic. In a 2009 Pew Global Attitudes Project survey, for example, whereas 69% of those Indonesians and Nigerians surveyed reported viewing the United States favourably, just 18% of those polled in Egypt, Jordan, Pakistan, and Turkey (traditionally US allies) did. And in 2006, when the Pew survey last asked detailed questions about Muslim-Western relations, more than half of the respondents in Muslim countries characterised those relations as bad and blamed the West for this state of affairs.

“Strategists worldwide must consider that the world's young are becoming concentrated in those countries least prepared to educate and employ them. Any resulting poverty, social tension, or ideological radicalisation could have disruptive effects in many corners of the world.”

But improving relations is all the more important because of the growing demographic weight of poor Muslim countries and the attendant increase in Muslim immigration, especially to Europe from North Africa and the Middle East. (To be sure, forecasts that Muslims will soon dominate Europe are outlandish: Muslims compose just three to ten percent of the population in the major European countries today, and this proportion will at most double by midcentury.) Strategists worldwide must consider that the world's young are becoming concentrated in those countries least prepared to educate and employ them. Any resulting poverty, social tension, or ideological radicalisation could have disruptive effects in many corners of the world. But this need not be the case; the healthy immigration of workers to the developed world and the movement of capital to the developing world, among other things, could lead to better results.

4. Urban sprawl

Exacerbating twenty-first-century risks will be the fact that the world is urbanising to an unprecedented degree. The year 2010 will likely be the first time in history that a majority of the world's people live in cities rather than in the countryside. Whereas less than 30% of the world's population was urban in 1950, according to UN projections, more than 70% will be by 2050.

Lower-income countries in Asia and Africa are urbanising especially rapidly, as agriculture becomes less labour intensive and as employment opportunities shift to the industrial and service sectors. Already, most of the world's urban agglomerations—Mumbai (population 20.1 million), Mexico City (19.5 million), New Delhi (17 million), Shanghai (15.8 million), Calcutta (15.6 million), Karachi (13.1 million), Cairo (12.5 million), Manila (11.7 million), Lagos (10.6 million), Jakarta (9.7 million)—are found in low-income countries. Many of these countries have multiple cities with over one million residents each: Pakistan has eight, Mexico 12, and China more than 100. The UN projects that the urbanised proportion of sub-Saharan Africa will nearly double between 2005 and 2050, from 35% (300 million people) to over 67% (1 billion). China, which is roughly 40% urbanised today, is expected to be 73% urbanised by 2050; India, which is less than 30% urbanised today, is expected to be 55% urbanised by 2050. Overall, the world's urban population is expected to grow by 3 billion people by 2050.

This urbanisation may prove destabilising. Developing countries that urbanise in the twenty-first century will have far lower per capita incomes than did many industrial countries when they first urbanised. The United States, for example, did not reach 65% urbanisation until 1950, when per capita income was nearly \$13,000 (in 2005 dollars). By contrast, Nigeria, Pakistan, and the Philippines, which are approaching similar levels of urbanisation, currently have per capita incomes of just \$1,800–\$4,000 (in 2005 dollars).

“...countries with younger populations are especially prone to civil unrest and are less able to create or sustain democratic institutions. And the more heavily urbanised, the more such countries are likely to experience Dickensian poverty and anarchic violence.”

According to the research of Richard Cincotta and other political demographers, countries with younger populations are especially prone to civil unrest and are less able to create or sustain democratic institutions. And the more heavily urbanised, the more such countries are likely to experience Dickensian poverty and anarchic violence. In good times, a thriving economy might keep urban residents employed and governments flush with sufficient resources to meet their needs.

More often, however, sprawling and impoverished cities are vulnerable to crime lords, gangs, and petty rebellions. Thus, the rapid urbanisation of the developing world in the decades ahead might bring, in exaggerated form, problems similar to those that urbanisation brought to nineteenth-century Europe. Back then, cyclical employment, inadequate policing, and limited sanitation and education often spawned widespread labour strife, periodic violence, and sometimes—as in the 1820s, the 1830s, and 1848—even revolutions.

International terrorism might also originate in fast-urbanising developing countries (even more than it already does). With their neighbourhood networks, access to the Internet and digital communications technology, and concentration of valuable targets, sprawling cities offer excellent opportunities for recruiting, maintaining, and hiding terrorist networks.

5. Defusing the bomb

Averting this century's potential dangers will require sweeping measures. Today's population bomb is the product less of absolute growth in the world's population than of changes in its age and distribution. Policymakers must, therefore, adapt today's global governance institutions to the new realities of the ageing of the industrialised world, the concentration of the world's economic and population growth in developing countries, and the increase in international immigration.

During the Cold War, Western strategists divided the world into a "First World," of democratic industrialised countries; a "Second World," of communist industrialised countries; and a "Third World," of developing countries. These strategists focused chiefly on deterring or managing conflict between the First and the Second Worlds and on launching proxy wars and diplomatic initiatives to attract Third World countries into the First World's camp. Since the end of the Cold War, strategists have largely abandoned this three-group division and have tended to believe either that the United States, as the sole superpower, would maintain a Pax Americana or that the world would become multipolar, with the United States, Europe, and China playing major roles.

Unfortunately, because they ignore current global demographic trends, these views will be obsolete within a few decades. A better approach would be to consider a different three-world order, with a new First World of the ageing industrialised nations of North America, Europe, and Asia's Pacific Rim (including Japan, Singapore, South Korea, and Taiwan, as well as China after 2030, by which point the one-child policy will have produced significant ageing); a Second World comprising fast-growing and economically dynamic countries with a healthy mix of young and old inhabitants (such as Brazil, Iran, Mexico, Thailand, Turkey, and Vietnam, as well as China until 2030); and a Third World of fast-growing, very young, and increasingly urbanised countries with poorer economies and often weak governments.

“Strategists...must fundamentally reconsider the structure of various current global institutions. The G-8, for example, will likely become obsolete as a body for making global economic policy. The G-20 is already becoming increasingly important, and this is less a short-term consequence of the ongoing global financial crisis than the beginning of the necessary recognition that Brazil, China, India, Indonesia, Mexico, Turkey, and others are becoming global economic powers.”

To cope with the instability that will likely arise from the new Third World's urbanisation, economic strife, lawlessness, and potential terrorist activity, the ageing industrialised nations of the new First World must build effective alliances with the growing powers of the new Second World and together reach out to Third World nations. Second World powers will be pivotal in the twenty-first century not just because they will drive economic growth and consume technologies and other products engineered in the First World; they will also be central to international security and cooperation. The realities of religion, culture, and geographic proximity mean that any peaceful and productive engagement by the First World or Third World countries will have to include the open cooperation of Second World countries.

Strategists, therefore, must fundamentally reconsider the structure of various current global institutions. The G-8, for example, will likely become obsolete as a body for making global economic policy. The G-20 is already becoming increasingly important, and this is less a short-term consequence of the ongoing global financial crisis than the beginning of the necessary recognition that Brazil, China, India, Indonesia, Mexico, Turkey, and others are becoming global economic powers. International institutions will not retain their legitimacy if they exclude the world's fastest-growing and most economically dynamic countries. It remains essential, therefore, despite European concerns about the potential effects on immigration, to take steps such as admitting Turkey into the European Union. This would add youth and economic dynamism to the EU—and would prove that Muslims are welcome to join Europeans as equals in shaping a free and prosperous future. On the other hand, excluding Turkey from the EU could lead to hostility not only on the part of Turkish citizens, who are expected to number 100 million by 2050, but also on the part of Muslim populations worldwide.

NATO must also adapt. The alliance today is composed almost entirely of countries with ageing, shrinking populations and relatively slow-growing economies. It is oriented toward the Northern Hemisphere and holds on to a Cold War structure that cannot adequately respond to contemporary threats. The young and increasingly populous countries of Africa, the Middle East, Central Asia, and South Asia could mobilise insurgents much more easily than NATO could mobilise the troops it would need if it were called on to stabilise those countries. Long-standing NATO members should, therefore—although it would require atypical creativity and flexibility—consider the logistical and demographic advantages of inviting into the alliance countries such as Brazil and Morocco, rather than countries such as Albania. That this seems far-fetched does not minimise the imperative that First World countries begin including large and strategic Second and Third World powers in formal international alliances.

Never since 1800 has a majority of the world's economic growth occurred outside of Europe, the United States, and Canada. Never have so many people in those regions been over 60 years old. And never have low-income countries' populations been so young and so urbanised. But such will be the world's demography in the twenty-first century. The strategic and economic policies of the twentieth century are obsolete, and it is time to find new ones.

Does intergenerational unfairness threaten political stability?

By Angus Hanton of the Intergenerational Foundation (if.org.uk) a research charity

The rapid rise in life expectancies has widespread implications for the insurance industry, affecting annuity rates, life policies and long-term returns on investments. However, increased longevity also puts great strain on intergenerational fairness: as the burden of looking after the elderly increases through rising costs of pensions, housing, medical costs and care, this has a direct influence on the well-being of the younger generation. Young people are rapidly waking up to the fact that prospects are worse for them than they were for the “baby boomer” generation but they are also realising that many of the older generation’s comforts are now contributing to their own discomforts. The danger is that the young may well react negatively to seeing their disadvantages being “locked in” especially if their well-being deteriorates further.

Longer life expectancies are being experienced across the western world, but these in turn contribute to a higher “dependency ratio” – a higher proportion of the population is dependent on those of working-age. Whilst this was always going to be a challenge for the younger generation, other factors have been working to create further economic tensions between the generations. This article argues that without determined action by governments to address intergenerational unfairness there may be significant social unrest over these issues. Whilst this article concentrates on the UK situation, the issues are similar across Europe and beyond.

Costs of elderly care increasing

Health costs have always been heaviest for the older generation but these are now rising even more than might have been expected: there are more available treatments for elderly patients, which are increasingly expensive, and advances in medical technology make it possible to keep people alive for much longer. On top of these medical costs, the demand for nursing care is increasing inexorably.

“The number of dementia sufferers worldwide is expected to increase from the current level of 35–40 million people to about 115 million by 2050. In the UK the figure is 750,000 with over one million sufferers expected nine years from now.”

The rapid rise in the incidence of both dementia and diabetes illustrates how much medical costs of the elderly are likely to rise. The number of dementia sufferers worldwide is expected to increase from the current level of 35–40 million people to about 115 million by 2050. In the UK the figure is 750,000 with over one million sufferers expected nine years from now. The caring and medical costs of dementia in the UK are estimated by some to be already as high as £20 billion per annum.

Diabetes is also rising very rapidly and in the UK the increase has been from 1.4 million in 1996 to 2.6 million today with expectations that by 2025 it will be over 4 million, with much of this increase in the elderly population. In the UK, diabetes is already estimated to consume 10% of the NHS’s £106 billion budget and there are also significant additional costs in demand for social services.

Unexpectedly high costs of past pension promises

This is important because so many pensions are, in effect, blank cheques to be paid by the next generation – these pensions pay out on a pre-determined basis – typically a proportion of an individual's final salary, indexed to inflation. At the heart of this is the commitment to pay pensions for government employees, which in the UK cover 12 million people: here the unfunded liability is about £1.2 trillion, equivalent to £45,000 of debt per UK household.

In addition there is the cost of the state pension which is also an unfunded liability and amounts to a further £75,000 per UK household.

Both these government liabilities have increased rapidly in recent years mainly as a result of increases in life expectancy, but the rising costs for future taxpayers have received relatively little attention. Furthermore, the affordability of these liabilities is dependent critically on a high rate of economic growth, with a rate of 3% per year (real) being typically assumed in government accounting. If this economic growth fails to materialise, which looks increasingly likely, then the unaffordability of these promises will become obvious.

Apart from future costs for care of the elderly and pension payments there are also potentially divisive issues of intergenerational fairness in the labour market which are attracting increasing interest.

Do people working in retirement take younger people's jobs?

This question is often asked and the broad consensus amongst labour market economists seems to be “they do in a recession, but not if the economy is buoyant”. If one considers that there is a fixed amount of work to do then those who stay in work beyond retirement are stopping younger people getting work, but this idea of a fixed amount of work is the “lump of labour fallacy”. In reality the economy is more dynamic and if more people are working this should actually increase the total size of the economy – and, incidentally, raise tax revenues. However, the situation is different in an economic recession where someone working beyond retirement age is more likely to be depriving a younger person of work. But, perversely, in a recession people in retirement are more likely to seek work and compete with younger people for jobs.

“Older workers often have advantages over younger applicants in the labour market – they have experience, a proven track record, are less likely to switch jobs, travel for free on public transport, and can sometimes afford to work for lower wages.”

Older workers often have advantages over younger applicants in the labour market – they have experience, a proven track record, are less likely to switch jobs, travel for free on public transport, and can sometimes afford to work for lower wages. They also benefit from the insider vs. outsider advantage in that they are often already in work and are continuing beyond retirement age, where they now have strong legal rights to retain their employment. Some advantages for older people at work derive from the tax system – in the UK they have a higher personal allowance and they don't have to pay any National Insurance over the state retirement age.

In the UK and elsewhere, those in the baby-boomer generation (in the UK this is roughly those born in the years 1946 to 1964) have largely organised society around their own interests and this is particularly apparent in the taxation of housing and town planning regimes.

Housing under-occupation – millions of unused bedrooms in older households

People living longer will very often stay in the family home which, whilst totally understandable, means that they are likely to retain two or more spare bedrooms for many years: their longer lives will mean they will retain these unoccupied rooms for much longer than would have been the case in the past. The logical consequence is that with increased life expectancies demand for housing is growing much faster than could be met through new home building. Indeed, in the UK annual housebuilding is running at less than 0.5% of the total housing stock whilst the population is expected to grow at about 0.6% each year. So even without the problem of under-occupation in older households, the new housing supply is running behind the new housing demand. Apart from the practical and emotional reasons for not moving, we have created large unintended financial incentives for older people to retain family homes – holding housing represents a good investment which is lightly taxed, it is a hedge against inflation, housing is a scarce and tangible resource and, when realised, the gain on the investment is tax-free. All this may sound rather arcane, but to many younger people it is a major, but somewhat hidden, contributor to “their” housing crisis.

Planning systems tend to be stacked against new development

The recent Localism Bill is intended to create a presumption in favour of sustainable development (as were so many measures before it!) but the planning system devolved to local authorities is most unlikely to allow the creation of anything like the amount of new housing which is required. Some campaigners have suggested that the individuals involved (such as planning committee members and others) are mostly from the baby-boomer generation and do not give much priority to the housing needs of younger people. It could also be said that rationing of planning permissions works to the advantage of older people who hold property assets because it maintains or increases the value of these assets.

Attitudes towards young and old

A recent survey of 29 countries across Europe asked some searching questions about people’s attitudes to those in other generations. The results, which have been analysed by the Intergenerational Foundation, show clearly that people in the UK are less tolerant both towards young people and towards the elderly. For example, in this survey the UK came out at the bottom for the amount of respect and value given to young people. Compared to other countries, people in the UK also believed that their young people were contributing least to society. Such results do not suggest intergenerational harmony, yet these concerns are only just appearing on the policy agendas of the political parties.

Is intergenerational tension already showing itself?

Tensions between younger and older generations were very apparent in the Arab Spring 2011 uprisings in the Middle East where the old regime was seen to represent an older and over-privileged generation. In London too, whilst no serious commentator condones the August 2011 riots, it was clear that these were partly the result of the frustration and anger of many in the younger generation without a stake in society.

“ *Their perceptions [the young] are dominated by personal contacts and, as most people socialise with those in the same age group, they feel that the economic difficulties they face are the same for everyone and they assume it has always been this tough...this may account for why we have, so far, seen relatively little protest about the economic discrepancies between the generations.* ”

But there is also an interesting phenomenon in how young people perceive their own position – they are generally brought up to be both trusting and optimistic. Their perceptions are dominated by personal contacts and, as most people socialise with those in the same age group, they feel that the economic difficulties they face are the same for everyone and they assume it has always been this tough: they don't know just how much easier it was for their parents' generation to find jobs and affordable housing. This may account for why we have, so far, seen relatively little protest about the economic discrepancies between the generations.

Is the outlook for the young so very bleak?

Longer term, there are two factors which should, at least in theory, bring some balance between generations' well-being: inflation and labour shortages.

Inflation is increasing in most western economies and can be said to help governments in various ways, including reducing the burden of their debt. It can also help younger people in that inflation confiscates from savers but rewards borrowers. However, against this is the fact that the baby-boomer generation, having lived through the 1970s, is acutely aware of the dangers of inflation and has largely protected itself by insisting that its pensions are index-linked and by investing heavily in property. Neither of these options is available to most young people.

In principle where younger workers should gain from demographic changes is from a shortage of labour as the dependency ratio moves in their favour. As the working population becomes smaller workers should be able to increase their real wages and win back some economic benefits from an older generation in need of services and care. But even here the likely outcome is very unclear as the older generation may find alternatives to paying higher wages to the younger cohorts. One possible way to keep down wages is to encourage immigration: there are many potential immigrants who would willingly take jobs in industrialised countries such as the UK. To some extent we have already seen this in the UK where Eastern Europeans have kept down wages in the construction industry and domestic sector. Whilst the subject is emotive and one on which people hold strong opinions, we simply observe that government decisions on immigration will affect labour costs and wages and the economic balance between old and young.

What can the young do about intergenerational unfairness?

“...younger people are extremely good at communicating electronically and in organising themselves through mobile phones and the Internet. As a result they may well look to effect change in ways that do not fit in with conventional democratic means.”

The obvious response is for them to organise themselves and work through the ballot box for measures that improve their relative position, but this seems unlikely to be effective for two reasons. First, older voters are more numerous and they are also more inclined to vote. Secondly, for a variety of reasons, younger people are disillusioned about the democratic process and a high proportion are apathetic and do not vote. Despite this, younger people are extremely good at communicating electronically and in organising themselves through mobile phones and the Internet. As a result they may well look to effect change in ways that do not fit in with conventional democratic means.

“...threats to political stability could very well come from both old and young.”

As benefits and health services are squeezed by budget constraints and by cuts in spending, we are also seeing protests from the older elements of society, so threats to political stability could very well come from both old and young.

How might this affect the investment market?

From an investment point of view there are several areas of concern:

- Would political instability undermine all investment values?
- Will healthcare and other age-related spending really increase as rapidly as projections of demand suggest?
- Will the governments want to restrain inflation when it is needed by them and by a generation of borrowers?
- As the dependency ratio worsens and growth becomes slower or negative, will this push down stock market valuations?
- If pension promises turn out to be unaffordable how will governments react? If they significantly reduce these or tax them severely this will drastically reduce the spending power of the retired, which would otherwise be expected to grow.

What is to be done?

There may well be things that can be done to improve the position of younger generations and hence reduce the risks of political instability. Here are some suggestions for the UK:

- Where the employment market favours older workers significant changes could be made to reduce unemployment amongst the young. Employment and tax policies will need to be made youth-friendly.
- Younger people can publicise much more widely how much they have been disadvantaged. Most policy makers have children and will want to improve things for them, yet many older people are still unaware of the tensions emerging.
- There could be much more measurement by age cohort of where resources go and where taxes come from. Policies and budgets could be systematically measured for their intergenerational impacts.
- There needs to be a fairer sharing of care costs for the elderly between generations, as the recent Dilnott report implies, whether as a charge against home values or an insurance policy of some sort.
- There are many areas where the interests of the young could be made to coincide. For example, more of the housing stock could be made available to young people by giving older people significant incentives to downsize or incentives to take in tenants.

In conclusion, the increasing burden of an older population creates distributional questions between existing generations and further tempts all current generations to borrow from the future through the continuing build-up of liabilities. The tensions created must be addressed explicitly if intergenerational strife is to be avoided.

Population Ageing: Facts, Challenges and Responses⁸

David E. Bloom, Axel Börsch-Supan, Patrick McGee and Atsushi Seike

Introduction

The world's population is growing older, leading us into uncharted demographic waters. There will be higher absolute numbers of elderly people, a larger population share of the elderly, longer healthy life expectancies, and relatively fewer working-age people. There are alarmist views – both popular and academic – regarding what these changes might mean for individuals, businesses, and national economies. However, the effects of population ageing are not straightforward to predict. Population ageing does raise some formidable and fundamentally new challenges, but they are not insurmountable. These changes also bring some new opportunities, because people have longer, healthier lives, resulting in extended working years, and different capacities and needs. The key is adaptation on all levels: individual, organisational and societal. This article explores some potentially useful responses from government and business to the challenges posed by ageing.

Trends and patterns in population ageing⁹

Population ageing is taking place in every country in the world. Three factors underlie this trend:

- **Increased longevity:** In most parts of the world, people are living significantly longer than in previous decades. For the world as a whole, life expectancy at birth has increased by two decades since 1950 (from 48 years in 1950–55 to 68 years in 2005–10). The UN Population Division projects that during the current half century, global life expectancy will rise further to 76 years.
- **Declining fertility:** The world's total fertility rate fell from 5 children per woman in 1950 to roughly 2.5 today, and it is projected to drop further to about 2.2 by 2050. As families have fewer children, the elderly share of the population naturally increases.
- **The ageing of “baby boom” generations:** the ageing of large cohorts of children born after World War II in the United States – paralleled by similar booms elsewhere at various times – is leading to high shares of elderly people.

At the global level, the number of those over age 60 is projected by the UN Population Division to increase from just under 800 million today (11% of world population) to just over 2 billion in 2050 (22% of world population). World population is projected to increase 3.7 times from 1950 to 2050, but the number of those aged 60 and over will increase by a factor of nearly 10. Among the elderly, the “oldest old” – i.e., those aged 80 and over – is projected to increase by a factor of 26.

⁸ This article is revised and updated from an original article by the same authors: “Population Ageing: Facts, Challenges, and Responses”, *Benefits & Compensation International*, magazine, Volume 41, Number 1 July/August 2011, pp 22–28. © Pension Publications Limited, London, England. Tel: + 44 20 7222 0288. Fax: + 44 20 7799 2163 Website: www.benecompintl.com

David E. Bloom is Clarence James Gamble Professor of Economics and Demography at the Harvard School of Public Health, and Director of Harvard University's Program on the Global Demography of Ageing. Axel Börsch-Supan is Professor for the Economics of Ageing, Technical University of Munich, Germany, and director of the Munich Center for the Economics of Ageing at the Max Planck Institute for Social Law and Social Policy. Patrick McGee is a senior research analyst at the World Economic Forum in Geneva. Atsushi Seike is president of Japan's Keio University and a professor in its Faculty of Business and Commerce. He is also president of the Japan Association of Private Universities and Colleges

⁹ The quantitative demographic data in this section are derived from United Nations Population Division (2011)

Accompanying these projected increases in elder shares throughout the world is another salient trend: the “compression of morbidity”. Anti-ageing technologies – from memory-enhancing drugs to high-tech joint replacements – and healthier lifestyles have not merely increased longevity but have also made old age healthier. As a result, the morbid years – when people lose their functional independence and their minds and bodies break down – are compressed into a smaller part of the life cycle, either relatively or absolutely. Thus, in addition to lifespans growing longer, potential working lifespans are longer still. Indeed, it may be reasonably anticipated that in the coming decades, employees in significantly growing numbers – *particularly those who are not doing manual labour* – will be able to work productively into much later ages than currently.

Although population ageing is occurring in both developed and developing countries, Table 1 shows that the 10 countries with the highest shares of 60+ population in 2011 are all in the developed world (or are countries in transition, such as Bulgaria and Croatia). The picture will change by 2050, when perhaps most notably Cuba will enter the list – and Finland and Sweden, for example, will no longer be on it. Most remarkably, the UN projects that in 2050 there will be 42 countries with higher shares of 60+ population than Japan has now.

Table 1: Countries with the highest shares of 60+ population in 2011 and 2050 (percent)
(among countries with 2011 population of 1 million or more)

2011		2050	
Japan	31	Japan	42
Italy	27	Portugal	40
Germany	26	Bosnia and Herzegovina	40
Finland	25	Cuba	39
Sweden	25	Republic of Korea	39
Bulgaria	25	Italy	38
Greece	25	Spain	38
Portugal	24	Singapore	38
Belgium	24	Germany	38
Croatia	24	Switzerland	37

Source: United Nations Population Division (2011).

For another perspective, Table 2 shows that the most rapid ageing is taking place primarily in relatively newly industrialised or developing countries.

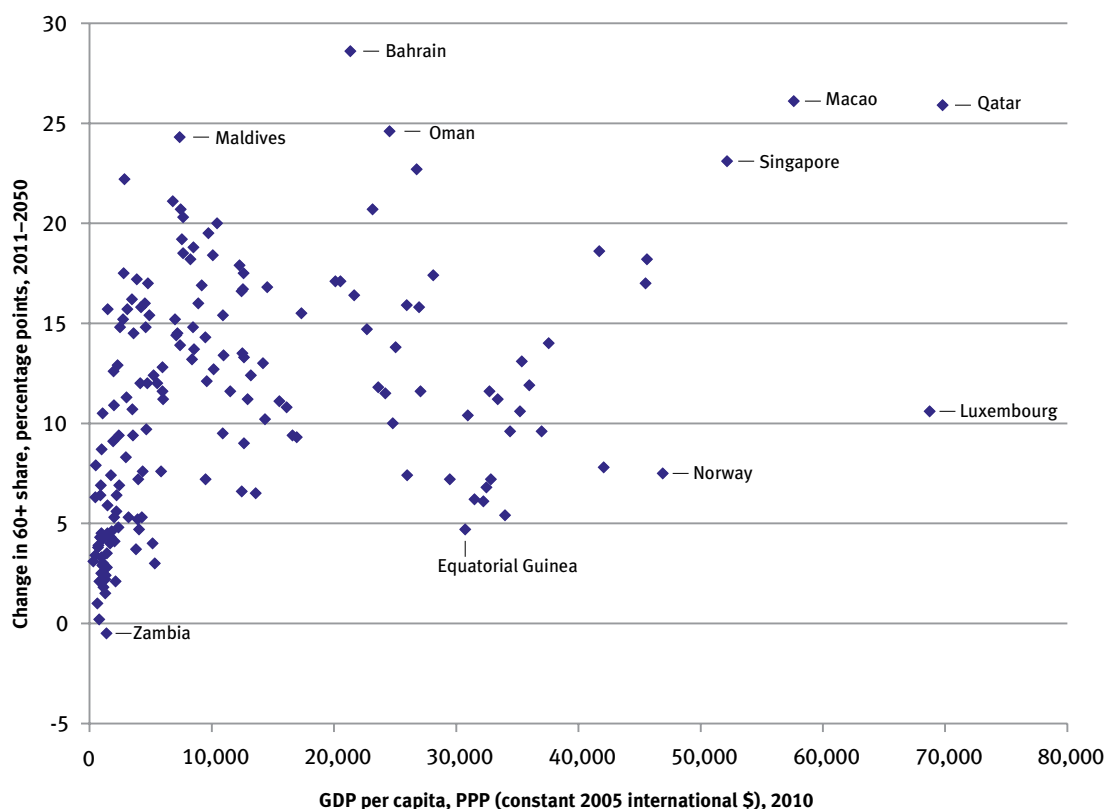
Table 2: Countries with largest percentage point increase in 60+ share, 2011–2050
(among countries with 2011 population of 1 million or more)

	Increase, 2011–2050	60+ share, 2050
United Arab Emirates	35	36
Bahrain	29	32
Iran	26	33
Oman	25	29
Singapore	23	38
Republic of Korea	23	39
Vietnam	22	31
Cuba	22	39
China	21	34
Trinidad and Tobago	21	32

Source: United Nations Population Division (2011).

Figure 1 shows that population ageing is taking place in virtually all countries, with considerable variation in the projected rate of increase of those aged 60 and above found across all levels of income.

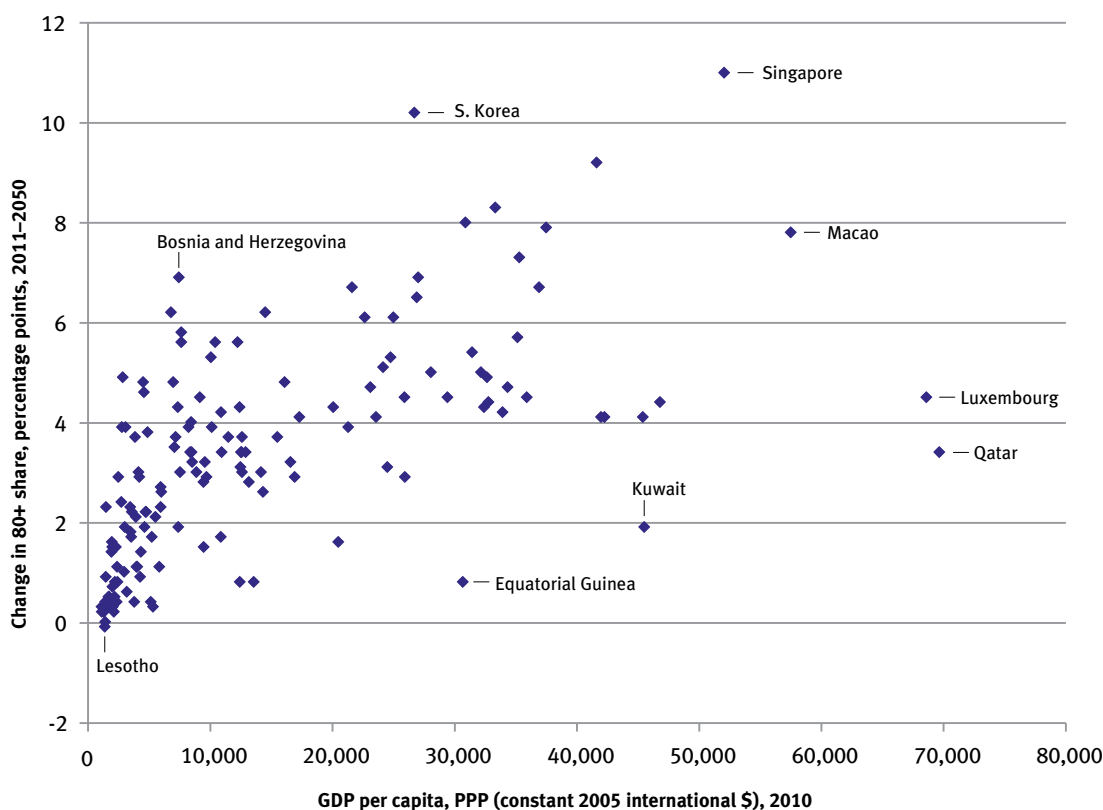
Figure 1: Change in 60+ share, 2010–2050, versus income level



Source: United Nations Population Division (2011). World Population Prospects: The 2010 Revision. New York: UN Population Division and World Bank (2012). World Development Indicators 2012. Washington: The World Bank.

While ageing is taking place in almost all countries of the world, rich and poor, very high longevity is still highly correlated with very high income levels. This holds not only for the level but also the change in the proportion of the “oldest old”. Figure 2 shows the clear-cut relationship between population ageing and income level: more developed countries can expect to see a more rapid rise in the 80+ share of their populations.

Figure 2: Change in 80+ share, 2010–2050, versus income level



Source: United Nations Population Division (2011); World Bank (2012).

Challenges

Population ageing generates many challenges and sparks concerns about the pace of future economic growth, the operation and financial integrity of healthcare and pension systems, and the well-being of the elderly.

The size and quality of the workforce

Economic prosperity depends crucially on the size and quality of the workforce. As people pass through their 50s and beyond, their likelihood of participating in the labour force tends to decrease. The stock of assets in an economy could also decrease as the elderly increasingly rely on their savings to finance their spending. The combination of possible labour market tightening and dissaving raises concerns that the steeply ageing countries (cf. Tables 1 and 2) will experience slower economic growth.¹⁰ Some countries' economies may even shrink.

“...because of falling fertility rates, the labour force as a share of total population has been increasing and is expected to continue increasing through 2050. Thus, one of the most widely cited fears about population ageing – that there will be a crushing rise in elderly dependency...appears to be unfounded for the world as a whole.”

¹⁰ Börsch-Supan, A., and A. Ludwig (2009). “Ageing, Asset Markets, and Asset Returns: A View from Europe to Asia.” *Asian Economic Policy Review* 4: 69–92

Analysis by Bloom, Canning, and Fink¹¹ counters the specific argument about a shrinking labour force. It is true that the global labour force participation rate (LFPR) has been declining and is expected to decline further by 2050 (see Table 3), and part of this change can be attributed to population ageing. However, because of falling fertility rates, the labour force as a share of total population has been increasing and is expected to continue increasing through 2050. Thus, one of the most widely cited fears about population ageing – that there will be a crushing rise in elderly dependency unless the labour force participation of the elderly drastically increases – appears to be unfounded for the world as a whole, notwithstanding very steep increases in particular countries such as Italy and Japan.

Table 3 illustrates this point, by providing actual global labour force rates in 1960 and 2005 and projected rates in 2050. The projections are formed by assuming each country's age- and sex-specific labour force rates in 2005 remain constant and applying them to projected demographics in 2050.

Table 3: Global labour force: 1960, 2005, and 2050

	1960 Actual	2005 Actual	2050 Projected
LFPR (labour force/population 15+)	67.4	65.8	61.4
LFTP (labour force/total population)	42.3	47.1	49.0

Source: Bloom, Canning, and Fink (2010).

The first row shows the global labour force participation rate as a summary statistic. This is the ratio of the labour force to the population aged 15 and over. The second row shows the global labour force-to-population ratio as a summary statistic. This is the ratio of the labour force to the total population. Note that the global labour force participation rate is projected to fall 4.4 percentage points from 2005 to 2050 (from 65.8 to 61.4). This is the labour force indicator that many analysts find so alarming.

Note that the alternative labour force indicator in the second row shows a very different pattern. This indicator – the size of the labour force expressed as a ratio to total population – will actually increase by about two percentage points (from 47.1 to 49.0). This is mainly because of falling fertility in developing countries. In fact, this projection of the labour-force-to-population ratio likely underestimates the actual increase that will take place since it does not account for the likely positive effect of lower fertility on female labour force participation.¹² The key point here is that the increase in elderly dependants will be more than offset by a decline in youth dependants. This offset suggests that population ageing does not pose an imminent economic crisis for the world.

“...such low participation rates provide a chance to counter the negative economic effects of population ageing, because they leave considerable scope to increase a population's total labour force participation by taking steps to encourage people to retire later.”

This is different for particular economies, such as those countries of the Organisation for Economic Cooperation and Development (OECD) in which fertility is already low. However, these economies (e.g., Germany) typically have low labour force participation rates at old age. Ironically, such low participation rates provide a chance to counter the negative economic effects of population ageing, because they leave considerable scope to increase a population's total labour force participation by taking steps to encourage people to retire later.¹³ Indeed, labour force participation among the elderly has increased recently in many OECD countries, including Japan.

11 Bloom, David E., David Canning, and Günther Fink (2010). “Implications of Population Ageing for Economic Growth”, *Oxford Review of Economic Policy*, Vol. 26, No. 4, 583-612

12 See Bloom, David E., David Canning, Günther Fink, and Jocelyn Finlay (2009). “ ‘Fertility, Female Labor Force Participation, and the Demographic Dividend’”, *Journal of Economic Growth*, Vol. 14, No. 2, June 2009, 79-101

13 Börsch-Supan, A., and A. Ludwig (2010). “Old Europe is Ageing: Reforms and Reform Backlashes,” In: Shoven, J. (Ed.), *Demography and the Economy*, Chicago: University of Chicago Press, 169-204

Noncommunicable diseases

Population ageing signals the advent of a tremendous challenge: the tidal wave of noncommunicable diseases (NCDs). NCDs are currently responsible for roughly 60% of all deaths and nearly half of the loss of actual and effective life years due to disability and death. They range from a significant to a dominant cause of disability and death in high- and low-income countries in every world region, and among people who are classified as old and not old (working-age adults). The most important NCDs are cardiovascular disease, cancer, diabetes, and chronic respiratory disease. These diseases share four modifiable risk factors – tobacco use, physical inactivity, unhealthy diets, and the harmful use of alcohol – and one non-modifiable risk factor: age. Especially concerning is the fact that many people living with NCDs are undiagnosed, which often results in later and more costly treatment. Indeed, treatment and care costs tend to be relatively high for NCDs, with the prospect of even greater costs as expensive new medical technologies are introduced and access to public healthcare increasingly becomes universal. In order to counterbalance these cost increases, we may expect to see greater emphasis on disease prevention, including the spread of workplace wellness programs. Business ingenuity and effort may also be expected to usher in a wave of products and services to promote health.

Financial issues

In recent decades, much attention has been given to the potential effect of population ageing on asset prices. Specifically, there have been concerns that asset prices will fall as the elderly sell off their assets (an “asset meltdown”). Some analysts predicted asset meltdowns in housing markets due to decreased demand from ageing members of the post-World War Two baby boom generation.¹⁴ Fortunately, this and other dire predictions have proven overly pessimistic; mitigating factors such as the potential for policy change suggest a rather moderate effect on asset prices.¹⁵

Population ageing has implications for various types of pension systems. Publicly funded pay-as-you-go (PAYG) pension systems face serious challenges, as the number of beneficiaries will increase while the number of contributors will decline. Fully funded systems are not necessarily a panacea, since they need a long time until they can deliver substantial pensions; for the baby boomers who have not saved so far, it is simply too late to accumulate sufficient funds. Moreover, voluntary funded pension systems suffer from procrastination, while mandatory funded systems create governance problems. A mix of both systems is thus the risk-minimising solution.

Some countries, such as Germany and Sweden, have successfully solved their pension problems by effectively converting their defined benefit systems into a special form of defined contribution system, where actual pensions depend on the ratio of workers to retirees, augmented by a compensating funded system. The Swedish system relies explicitly on “national defined contribution” accounts; in Germany, the defined benefit formula was amended by a “sustainability factor” that reduces the annual pension increase in proportion to population ageing. Both reforms have been mimicked by other countries. Switzerland has taken the unusual step of allowing the establishment of a pension fund for a child when he or she is born. In addition, changes in the statutory retirement age are under way in most developed countries, although they are often highly contested and accompanied by popular protests.

¹⁴ Mankiw, N.G., and D. Weil (1989). “The Baby Boom, the Baby Bust, and the Housing Market.” *Regional Science and Urban Economics* 19: 235-258

¹⁵ See Börsch-Supan, A., and A. Ludwig (2009) and Poterba, J. (2004). “Impact of Population Ageing on Financial Markets in Developed Countries.” Federal Reserve Bank of Kansas City Annual Symposium, Jackson Hole, WY

Responses

Public policymakers and the business community are just beginning to acknowledge the coming acceleration of population ageing. Thus far, there has been little need for rapid policy changes, because population ageing has been slow and because large baby-boom generations have been fuelling business activity and economic growth. But the need for policy adaptations to an ageing population will become more important as baby boomers retire, slowing labour force growth, and the rising costs of pension and healthcare systems, especially in Europe, North America, and Japan. Businesses will soon have little choice but to be more attentive to the needs and capacities of older employees; their ability to adapt could become a source of competitive advantage. The United Nations Population Fund and HelpAge International¹⁶ discusses the substantial challenges brought by population ageing and calls for global and national action plans to respond to them. As an example of a country-level response, Shannon¹⁷ proposes an agenda for healthy ageing specific to Ireland. The World Economic Forum provides a comprehensive discussion of population ageing throughout the world and proposes an array of responses in different arenas.¹⁸

It is worth noting that, to a considerable extent, natural market adjustments will offset the impact of changing demographics (e.g., capital substitution for labour, or development and use of labour-saving technologies).

On an economy-wide scale, responses to longer lifespans will require a series of reforms to both public policy and business practices.

Public policy

Allowing people more freedom of choice regarding the timing of retirement is a good starting point for public policy reform. Between 1965 and 2005, life expectancy in 43 selected countries rose an average of 9 years; for the same period, the average legal retirement age rose by roughly 6 months.¹⁹ Various countries (e.g., France, Ireland, Greece, and the United Kingdom) have recently raised the normal legal retirement age. While these changes have been generally accepted in some countries (e.g., Germany and the USA), they have led to significant social conflict in others, indicating that further moves in this direction are possible but may not be easy. It is also important to note the distinction between actual and legal retirement ages; the former is influenced by the incentives offered by employers and existing policies.²⁰

“In order to avoid these negative effects of the public pension’s earnings test and mandatory retirement on the labour supply behaviour of the elderly,²¹ the Japanese government has started to raise the pension-eligible age from 60 to 65... This has had a significant impact, with the labour force participation rate for men aged 60-64 increasing from 71% in 2006 to 77% in 2009.”

16 United Nations Population Fund and HelpAge International (2012). *Ageing in the Twenty-First Century: A Celebration and a Challenge*. United Nations Population Fund, New York, and HelpAge International, London. <http://www.helpage.org/resources/ageing-in-the-21st-century-a-celebration-and-a-challenge/>

17 Shannon, Sinead (2012). *The New Agenda on Ageing: To Make Ireland the Best Country to Grow Old In*. Dublin: Ageing Well Network. <http://ageingwellnetwork.com/The-New-Agenda-On-Ageing>

18 Beard, John R., Simon Biggs, David E. Bloom, Linda P. Fried, Paul Hogan, Alexandre Kalache, and S. Jay Olshansky, eds., “Global Population Ageing: Peril or Promise”, Geneva: World Economic Forum, 2011

19 Bloom, David E., David Canning, and Günther Fink (2010)

20 Gruber, J., and D. A. Wise, (Eds.) (1999), *Social Security and Retirement Around the World*. Chicago, London: University of Chicago Press

21 Seike, Atsushi (2008). “Pensions and Labour Market Reforms for the Ageing Society,” in Conrad, Harald, Victoria Heindorf, and Franz Waldenberger, (eds.), *Human Resource Management in Ageing Societies*, Palgrave Macmillan: 29-42

There are several policy adjustment options that can encourage extended working years. Public pension systems in many countries could be reformed to remove incentives to retire between the ages of 60 and 65. Tax and benefit policies can also be adjusted so as to encourage, and capture the benefits of, prolonged careers. In Japan, the labour force participation rate for men aged 60–64 (about 77%) is considerably higher than in Australia, Canada, and the United States. But Japan’s public pension system still uses an earnings test, which encourages early retirement and part-time work and thus deprives the country of a capable and willing older workforce. Compounding this problem is the predominance of mandatory retirement practices, typically at age 60, in Japanese firms. According to a survey by Japan’s Ministry of Health, Labour and Welfare, workers in general still have a strong motivation to continue working after age 60. In addition, Japanese workers over age 45 seeking new employment are often deterred by maximum hiring ages. In order to avoid these negative effects of the public pension’s earnings test and mandatory retirement on the labour supply behaviour of the elderly,²² the Japanese government has started to raise the pension-eligible age from 60 to 65 and to require employers to extend employment to age 65. This has had a significant impact, with the labour force participation rate for men aged 60–64 increasing from 71% in 2006 to 77% in 2009.

“In most developing countries...the legal retirement age applies in practice to only a small proportion of the labour force, and pensions are relatively uncommon. People very often work until they can no longer do so and are then dependent on their children or remittances from abroad.”

In most developed countries, retirement itself is a complex process, which is often more of a transition involving early retirement, phased or partial retirement, or even unretirement. Changes in the legal retirement age will interact with this process in complicated ways. In most developing countries, by contrast, the legal retirement age applies in practice to only a small proportion of the labour force, and pensions are relatively uncommon. People very often work until they can no longer do so and are then dependent on their children or remittances from abroad.

Pension reform – under way in many countries – usually takes place in a slow process of many small steps and typically with many dimensions: a reduction in benefits; an increase in contributions of the PAYG part of the pension system; an expansion of individual accounts; and a gradual change in the statutory retirement age. Well-designed reforms affect the entire system and do not create loopholes (e.g., through disability or unemployment insurance), which can have work disincentive effects. Index schemes (e.g., linking benefits to the dependency ratio, and retirement age to life expectancy) can reduce political opposition.

Financing healthcare systems is extremely problematic in many countries, such as in the United States, where healthcare coverage is still not universal, there is considerable proclivity to use expensive new medical technology, and a significant portion of healthcare spending is accounted for by third-party payers. New financing systems will have to account for the greater healthcare needs of the elderly, especially in light of their increased numbers, older ages, and the continued development of expensive medical technologies.

22 Seike, Atsushi (2008). “Pensions and Labour Market Reforms for the Ageing Society,” in Conrad, Harald, Victoria Heindorf, and Franz Waldenberger, (eds.), *Human Resource Management in Ageing Societies*, Palgrave Macmillan: 29–42

Of theoretically possible benefit for both sending and receiving countries is the immigration of working-age people to ageing societies. To be fair to migrant workers, this solution would require institutionalisation of a system of portable benefits. However, huge numbers of immigrants would be necessary to compensate for population ageing.²³ Such numbers would likely face enormous political and social opposition by the electorates in Europe (and to a lesser extent, in the United States). Immigration is, therefore, unlikely to be a significant contributor to the problems posed by population ageing.

“...a consensus has now developed in favour of greater immigration of skilled foreign workers. Indeed, the number of professional workers from abroad has been rising, though the pace has been a bit slower than expected.”

Similar anti-immigrant feelings have long prevailed in Japan. Nevertheless, a consensus has now developed in favour of greater immigration of skilled foreign workers. Indeed, the number of professional workers from abroad has been rising, though the pace has been a bit slower than expected. Recently, Japanese companies have started increasing the recruitment of international students from both foreign and Japanese universities. The case for unskilled foreign workers is more difficult, because of the effect on domestic workers' wages, but also because of the danger of creating a dual labour market and therefore eventually a dual social structure, with the tensions that implies. It may be possible to overcome these problems by paying careful attention to the extent and timing of labour market opening, by enforcing labour standards (including minimum wages), by ensuring that social security applies to all workers, and by providing subsidies or other incentives to employers to provide adequate training to foreign workers so that they will not be locked at the bottom of the labour market.

Business practices

To adapt and possibly benefit from an increasingly aged world, businesses must shift organisational structures, and practices. As a start, attitudes need to change. Older workers are sometimes seen as a burden, with younger candidates preferred in recruitment decisions. But in an economy where knowledge rules, the experience of older workers grows in value, and they can serve as role models for younger workers. Employer surveys commonly reveal that workers aged over 60 are seen as more experienced, knowledgeable, reliable, and loyal than younger employees; practice should match that perception, as has occurred to some extent in smaller firms.

Older employees who wish to keep working may demand flexible roles and schedules. Allowing more part-time work and telecommuting will entice older workers to stay on, extending their careers by placing lighter burdens on their stamina. Likewise, allocating demanding physical tasks to younger employees will produce a similar benefit and may potentially reduce healthcare costs arising from workplace accidents.

“Ongoing training will help older workers master new skills as the economy changes. Moreover, longer working lives for employees allow firms the benefit of greater productivity gains from past training investments. A higher legal retirement age can increase these benefits.”

23 United Nations Population Division (2000). “Replacement Migration: Is it a Solution to Declining and Ageing Populations?”. New York: UN Population Division

Ongoing training will help older workers master new skills as the economy changes. Moreover, longer working lives for employees allow firms the benefit of greater productivity gains from past training investments. A higher legal retirement age can increase these benefits.

Investing in the health of all employees enhances productivity and avoids unnecessary costs as the workforce ages. Worker wellness programs produce healthier employees at all ages; on-site clinics save workers time and can focus care on prevention and early disease detection, further lowering costs.

Moving from pay systems that are seniority-based to ones that are performance-based (which has already occurred in many countries, including in the public sector) will invariably lead to a relaxation of corporate norms surrounding age at retirement. Careful thought and skilful negotiation will need to go into such a transition to ensure economic soundness, fairness, and political support. Moves in this direction have already taken place in Japan, with the age-based wage profile becoming less steep in the past two decades.

In designing business organisations of the future, the private sector – with appropriate public-policy support – should anticipate, rather than passively await, this trend toward longer lifespans and older employees. In one example of business opportunities spurred by ageing, media companies are hoping to profit from ageing viewers and readers by shifting their target away from the traditional range of 18–49 year olds.²⁴ Although some adaptations lie on the more distant horizon, others can be undertaken right now, to the benefit of both younger and older employees, firms, and society.

24 “Pensions: 70 or Bust.” (2011, April 7). The Economist. Available from http://www.economist.com/node/18529505?Story_ID=18529505

Biofutures and human enhancement

Jon Turney, acclaimed science writer and author of *The Rough Guide to the Future*

What will people be like in the future? In the past, the smart money was always on the answer, “much the same”. Today, an unscrupulous owner of a time machine could steal a stone-age baby away to the 21st century, and it would cope just fine in our Brave New World. But that might not be true for much longer.

Human beings have evolved, and are evolving. But old-fashioned natural selection is slow. In a relatively long-lived species like *Homo sapiens*, change is normally imperceptible. Human culture and ways of living have altered enormously over the span of history. We have extended our minds’ reach, perhaps altered our mentalities, through use of more, and more complex technologies. But the bodies, brains and nervous systems interacting with the technology remain as they were.

“*Biomedical science will offer, not just ways of making us better when we are ill, or keeping us well, but the possibility of moving to more than species normal functioning – to enhancements of our evolutionary endowment.*”

Now, though, our technology is poised to alter our own capabilities. Culture, in the shape of the biosciences, will supercede natural selection as the engine of evolution. We do not know where this will lead, but we can discern some of the early possibilities. They will emerge more clearly over the next few decades. Whichever path we take, and all the choices will generate intense controversy, the likelihood is that we will move into a genuinely new realm. Biomedical science will offer, not just ways of making us better when we are ill, or keeping us well, but the possibility of moving to more than species normal functioning – to enhancements of our evolutionary endowment.

This general prediction is founded on the remarkable half-century of biology which saw the life sciences register most of the greatest achievements in research in the second fifty years of the twentieth century.

The entire century has been dubbed the “century of the gene”. The idea of the gene – as a kind of elementary particle of inheritance – was defined roughly at the start of the century, and the structure of the genetic material DNA figured out almost exactly half way through.

The second half was then taken up with exploring the action of genes at the smallest level – a truly molecular biology. The molecules involved are an intricately poised set of nano-machines, of information carriers, and of links between them. They have all co-evolved in ways we are still elucidating. Their elementary workings were first puzzled out in simple bacteria. The eukaryotic (that is, nucleated) cells of more complex organisms mainly use the same mechanisms, but with many additional refinements.

In the last couple of decades of the century, it became possible to think about getting a complete knowledge not just of how genes work in general, but of the information encoded in all the genes of an organism. Astoundingly, that has now been done – beginning with the tiniest viruses and working up to the total complement of genes and DNA of the organism we are most interested in, the human genome.

That does not quite usher in the new age of medicine the architects of the genome project foresaw. There are many complexities of gene action and regulation yet to be teased out. And many of the traits we are deeply interested in result from small contributions of many genes. Still, the prospect of much more detailed understanding of cells, tissues, and organs, and how they develop, is better than ever.

From understanding comes informed intervention. If you know exactly what role a gene plays in some complex system, you can try modifying it, and see the effect. Sometimes, you modify it to help work out what it does. Either way, what began as decoding the genome moves toward rewriting. If that is a step too far, understanding gene products can help illuminate new possibilities for indirect action, using new natural bioactive molecules or synthetic drugs.

“*Genome-derived improvements in understanding cell biology will open the way to regenerative medicine, starting with tooth-buds perhaps, and working up to vital organs. Heart muscle renewal is a tantalising possibility.*”

Many of the applications that flow from this will look like business as usual. More and better medical treatments will appear. Knowledge of individuals' genomes, perhaps updated through life, will blend with established risk assessment and diagnostic techniques. Genome-derived improvements in understanding cell biology will open the way to regenerative medicine, starting with tooth-buds perhaps, and working up to vital organs. Heart muscle renewal is a tantalising possibility, for example.

Most experts expect real improvement in all these areas in a few decades, at most. As they work through, various kinds of enhancements will begin to become possible. There is no clear boundary between treatment and efforts to become “better than well”. Just as the relatively crude devices which now offer some sound-sensing to the deaf or a modicum of light registration to the blind could one day be refined to improve on the normal human senses, so more biologically-based interventions will gradually improve. Speculation about the ultimate possibilities, often allied with expectations of the convergence of biotechnology, nanotechnology, and information technology, runs to some pretty wild scenarios. Some look to the advent of post-humans who have, in effect, superpowers, and are immortal. But let us discount that for now, and look at just two areas where there are realistic prospects of significant developments in the medium-term, say the next 30–50 years.

Lifespan – a second great leap forward

Clean water, vaccination, improved nutrition and other public health measures and medical treatments have already led to one leap in average lifespan. Combined with lower birth rates, they also give us rapidly ageing populations in many countries. But while this has improved the life chances of billions, all we have really done is allow more people to reach the biblical span of three score and ten, with perhaps a decade or two on top for the most fortunate.

There is little reason to think that is the limit. Most evidence suggests that ageing is not programmed by the genes. Instead, it occurs because of accumulated damage and detritus, a kind of intra-cellular entropy. So small improvements in a few cellular processes could easily lead to incremental gains in lifespan. We're not talking immortality here. But there is every prospect of a seamless transition from intense research on the afflictions of old-age – a growing preoccupation worldwide – and treatments which allow a longer life. As a commentary in the British Medical Journal put it a few years ago: “The pursuit of extended healthy life through slowing ageing has the potential to yield dramatic simultaneous gains against many if not all of the diseases and disorders expressed in later life.”

The key will be to attain long lifespan without extended decrepitude. The all too familiar effects of ageing will still appear, eventually, but vigorous middle-age will continue for longer than it does now.

“Imagine...that instead of roughly one person in a billion making it to 110 we can fix things so that one person in 100 does so. Assume that goes along with a shift of the entire distribution of life expectancy, so that those currently destined to die at 90 become centenarians, and so on.”

How much longer? A moment's thought about biology suggests even a modest gain in understanding could make a big difference to us all. The existing maximum human lifespan is 120 or so. (The longest authenticated life was recorded by the Frenchwoman Jeanne Calment, who died aged 122 in 1997). Imagine first that instead of roughly one person in a billion making it to 110 we can fix things so that one person in 100 does so. Assume that goes along with a shift of the entire distribution of life expectancy, so that those currently destined to die at 90 become centenarians, and so on.

A treatment to ensure this, whether an intermittent removal of cellular garbage or a continual boost to the damage control systems of the cell, ought not to involve radical biological novelty. There are a few people who can already do the trick unaided, and several gene tweaks which extend the life of other organisms by a good deal more than this, proportionately. Even if it only works properly for people born after it is introduced, rather than undoing the damage already invisibly affecting 50 year-olds, it would have startling effects. In the nature of the result, they would take hold slowly. By the early 22nd century, there would be tens of millions of 110 year olds around the world. Before then, there would be billions who, all being well, had a reasonable expectation of living beyond 100, seeing a good chunk of the next century where once they would have discounted the possibility as fantasy. We can only guess what changes this would bring in its wake in education, finance, family patterns, housing, employment, and life plans, but they would not be small. The painful adjustments we are beginning to make now to pension financing as life expectancy creeps into the 80s and 90s are a simple example of larger issues to come. This, too, is a good problem to have, but personally and politically disruptive, nonetheless.

It is then not much of a stretch to imagine that a biology which continues to be spectacularly fruitful in the next half century will add, say, another ten per cent to the upper limit. Now the outliers are living to over 130, and a few tens of millions make it to 120.

The extension of life to this degree is not (yet) a radical change in the human condition. The end of life would be the same as always, and not so far distant. However, I suggest most are likely to see it as a good thing. More time, to make more choices, will be a chance many will want to take. So a first risk which attends the possibility is that, if some oppose this move – for whatever reason – they are unlikely to carry the day. If genetic alteration, which some view as illegitimate or “playing God”, is needed, opposition is likely to be stronger. Realistically, this is one technology which will not readily be controlled. Even if restrictions are put in place, some people, probably many people, will want it, and will do whatever it takes to get it.

“Within countries, elite access to a technology permitting longer life which is not generally available would create strong political tensions. In the worst case, it could even lead to a separate caste of extremely old oligarchs, rooted in the past, who wage inter-generational battles with their offspring, who do not come into their inheritance until what used to be retirement age.”

Wanting points to the next obvious risk, that life extension will widen inequalities, within and between societies. If medication is needed, especially if it is regular and costly, who will have access to it? If there are tricky procedures, there will be skill bottlenecks. We already tolerate startling global inequalities – average life expectancy in different countries varies now by a factor of two. But will we go further still? Within countries, elite access to a technology permitting longer life which is not generally available would create strong political tensions. In the worst case, it could even lead to a separate caste of extremely old oligarchs, rooted in the past, who wage intergenerational battles with their offspring, who do not come into their inheritance until what used to be retirement age.

It is possible that the environment could feel the benefit of a class of influential people with significantly longer lives. Treating global warming, say, as a problem for one's children to tackle is not an option if you are going to be around yourself for the better part of a century. On the other hand, unless birth rates decline rapidly, longer lives would mean a larger population than is now projected, and many of them with the consumption habits of the developed world. The various pollution and resource challenges which have to be dealt with this century would be exacerbated in that case.

None of this, to my mind, argues against trying to extend life. I do not personally advocate a crash programme of research to make it as long as possible on the grounds that death is a design flaw we ought to try and overcome, as some do. I do think a modest extension of life would be a fascinating additional ingredient in the late 21st century mix. But it would undoubtedly be a big enough change to bring some tricky issues in its wake.

Faster, longer, smarter?

We can hope the people who we imagine living longer will use the extra time to grow wiser. Will they also be smarter? We're working on that, too. Current research goals – from treatments for memory loss in Alzheimer's to drugs which allow infantry to survive long spells without sleep – lead fairly directly to the possibility of cognitive enhancement. And, again as with ageing, while the brain is a fantastically complex thing, we will not need total understanding to improve some aspects of its performance, whether for a quick boost or a lasting uplift. Genomics, for instance, will lead to a full inventory of neurotransmitter molecules, their multiple receptors and the enzymes which control their transport and turnover. This offers great scope for refining blunt instruments like the current generation of psychoactive drugs. The selective serotonin reuptake inhibitors – SSRIs – widely prescribed for depression, for example, are an advance on earlier medication because they only influence one transmitter. But they still increase levels of a neurotransmitter substance for which there are at least a dozen different receptors. Tuning drug design to select particular receptors or cell sub-types would permit more specific effects.

There are a range of other molecules which might have desirable effects in the brain. They include neurotrophic factors, which promote growth and survival of neurons. Further ahead, genes might be moderated by "antisense" RNA molecules which bind to particular gene sequences and block their use.

It is not easy getting drugs, especially if they are large molecules like RNA, into the brain. Nevertheless, some forecasters envisage an array of brain-active drugs which, in the right combinations, would enhance mood, attention, sensory acuity, and memory, if not yet actual understanding. Used in the right combinations, such drugs could enhance learning by making more efficient use of study time, and aiding retention. They might be suitable for use by future adults, whose portfolio careers require continual development of new skills.

“ Enhancing memory is all very well. But forgetting, which can also be enhanced by drug use, is as important as remembering. Disturbing the normal balance between the two ought not to be undertaken lightly – and those living to 120 will have more to forget. ”

Some of the risks here arise from the trade-offs which are bound to arise when trying to affect something as intricately made as our brains. Enhancing memory is all very well. But forgetting, which can also be enhanced by drug use, is as important as remembering. Disturbing the normal balance between the two ought not to be undertaken lightly – and those living to 120 will have more to forget. Effective educational use would require specific, not general memory enhancement, and would need to be short-term (the more effective retention, not the actual memories). Similarly, general improvement of synaptic transmission or nerve impulses might speed up brain processing. But one theory of the origins of autism suggests that it arises in part from enhanced brain functions, including sensory acuity. They might lead to a person blocking out some external signals as a way of coping with unbearably strong stimulation. Attempts at enhancement of a complex system which is poorly understood can easily stumble over the annoying fact that you can have too much of a good thing.

There are also likely to be trade-offs between enhancements. A telling example is a strain of mice which were engineered to be more receptive to a particular neurotransmitter. Among other roles, the chemical is involved in formation of memory. Giving adult mice more of a variant of the receptor normally prevalent in babies did appear to improve their capacity for mouse-level learning. It also made them more sensitive to pain.

Ignoring the trade offs for now, this class of enhancers has one thing in common with life-extension. Many people will want them. Substances which offer a small taste of such effects are eagerly taken up already. How many cups of coffee have you had today? There are plenty of students using prescription drugs, mostly stimulants and drugs that help you stay awake, to help them finish projects or cram for exams. As the drugs get more effective, demand is sure to increase.

Weighing the pros and cons will be fascinating. Who has not wished for a return to the ease of memorisation which children can often use? Imagine learning a new language or mastering a complex piece of music without as much slog as most adults have to put in now.

Doubtless, though, there will be side effects and potential problems with excess use. What risks will people be taking ingesting the novel neurotransmitter analogues, nerve growth stimulants, or whatever they are, in pursuit of a better performing brain? How long will they take to emerge?

“ Imagine the problems which beset competitive athletics now translated into the cognitive sphere. Or, perhaps more realistic, think of the way cosmetic surgery spreads from a few early adopters to a larger group who want to keep up with a new, artificial standard. Cognitive enhancers might be botox for the brain. ”

There are also problems of choice. With anti-ageing medication, it seems likely some people will want the stuff even if it is proscribed. The same could be true of cognitive enhancers. But there will also probably be those who feel they have no choice but to take them, and override their caution to satisfy their employer, or to compete with other candidates for a new job who are probably using drugs, licit or illicit. Imagine the problems which beset competitive athletics now translated into the cognitive sphere. Or, perhaps more realistic, think of the way cosmetic surgery spreads from a few early adopters to a larger group who want to keep up with a new, artificial standard. Cognitive enhancers might be botox for the brain.

Finally, both these new biological offerings would have a couple more things in common. They would not be one-offs. Each is likely to begin with small improvements, and then gradually increase in scope and availability. Both will also take a long time to show their full effects – a lifetime, in fact, however long that turns out to be. And by the time the lives of the early adopters are nearing their end, more powerful enhancements are likely to be on offer than the ones which were applied when they were young. The way these effects are by then working themselves out will have a profound effect on the complex debates which will be fought out as the catalogue of possibilities for enhancement grows. The prospects for Humanity 2.0 will be shaped by the baby steps toward new model *Homo sapiens* which we choose to take in the next several decades.

Coping with demographic change: modelling longevity risk and providing solutions to meet the funding gap

By Daniel Ryan, Head of Life and Health Research and Development, and Ron Wheatcroft, Technical Manager Swiss Re

There is no denying the fact that societies are ageing. In fact, the pace is faster in developing countries than in the developed world. While often presented as a challenge, it is perhaps more productive to view these changes as opportunities, as suggested by the recent World Economic Forum publication: “*Global population ageing: peril or promise*”. We should not forget that, as birth rates decline, ageing populations are a direct result of our success in extending life expectancy.

There have been dramatic advances in the treatment of infectious disease and cardiovascular disease, as well as greater awareness of modifiable risk factors such as smoking. In the future, we would expect to see further improvements in life expectancy driven by advances in the treatment of cancer and neurological diseases such as Alzheimer’s. There are, however, different schools of thought over the extent to which further increases in life expectancy are likely or justified, and the best models for making future predictions.

Predicting Future Trends

Actuarial models and principles examine trends in historical experience. The prime purpose of analysing experience in support of forward-looking models, however, should be to identify where there is scope for historical drivers of life expectancy to influence future predictions. Gathering data on the development of harmful risk factors, along with the diagnosis and treatment of new diseases from individual patient records – a life course approach – is the most complete solution to assess further changes in longevity.

New treatments need to satisfy a series of clinical trials that test their safety and assess their effectiveness. Many are unsuccessful, but even those that are successful can take a decade or more to complete. Obstacles, such as cost and current medical practices, can delay widespread adoption further. For example, the first statin treatment for lowering cholesterol was isolated in 1978 yet it took another 16 years for its benefits to be recognised widely.

New treatments need to be licensed and then recommended or approved for use. But acceptance by the medical profession is not the end of the story. The reaction to a now discredited report stating that a combined vaccine against measles, mumps, and rubella could cause autism, meant that many children were not vaccinated against these diseases. This demonstrates how public distrust can hamper future potential improvements.

“*The reaction to a now discredited report stating that a combined vaccine against measles, mumps, and rubella could cause autism, meant that many children were not vaccinated against these diseases. This demonstrates how public distrust can hamper future potential improvements.*”

A multi-disciplinary approach involving different stakeholders

Most deaths follow the development of multiple co-morbidities. This means that models studying diseases in isolation can be misleading. Mortality models that allow for co-morbidity need large patient databases that provide detailed information on the pattern of disease development. These need to draw on the talents of a range of different disciplines in their construction such as:

- **Actuaries**, to provide expertise and models for assessing the financial impact of uncertain, future events
- **Medical experts**, to provide insight into future developments in the diagnosis of disease and treatment guidelines
- **Epidemiologists**, who are experts in public health research to analyse harmful risk factors that lead to disease and how this might progress
- **Pharmacologists**, to provide expertise on the development of new medical drugs and opinions on potential impacts
- **Demographers**, who understand societal trends, to help aggregate the various influences to estimate future population sizes, essential for funding future longevity
- **Gerontologists**, to provide in-depth understanding of the physical, mental and social effects of ageing.

In the past, we were dependent on national statistics on all-cause and cause-specific mortality rates. There are now more extensive sources that provide full patient medical records to capture the individual history of investigation, diagnosis and treatment.

One example is the General Practice Research Database (GPRD), a live database of over five million patients in the UK. GPRD can provide high-quality information on the tracked experience of those with and without a prior history of disease. This information enables us to create a disease "mosaic", which identifies patterns of individual disease and co-morbidity by age and gender within the population. The value of such mosaics is that they provide a framework to consider the impact of different forward-looking scenarios.

“A scenario could be a timeline of developments with a common theme, such as introducing professional guidelines into clinical medical practice. Alternatively, it might summarise the variety of treatments and risk-factor behaviour in society at a future date.”

A scenario could be a timeline of developments with a common theme, such as introducing professional guidelines into clinical medical practice. Alternatively, it might summarise the variety of treatments and risk-factor behaviour in society at a future date. However the scenario is defined, we must be realistic about how far in the future we can make informed predictions for individual diseases. Treatment regimens more than 15 years in the future may not be under consideration in clinical trials currently, and could be based on very different paradigms to the treatments available today.

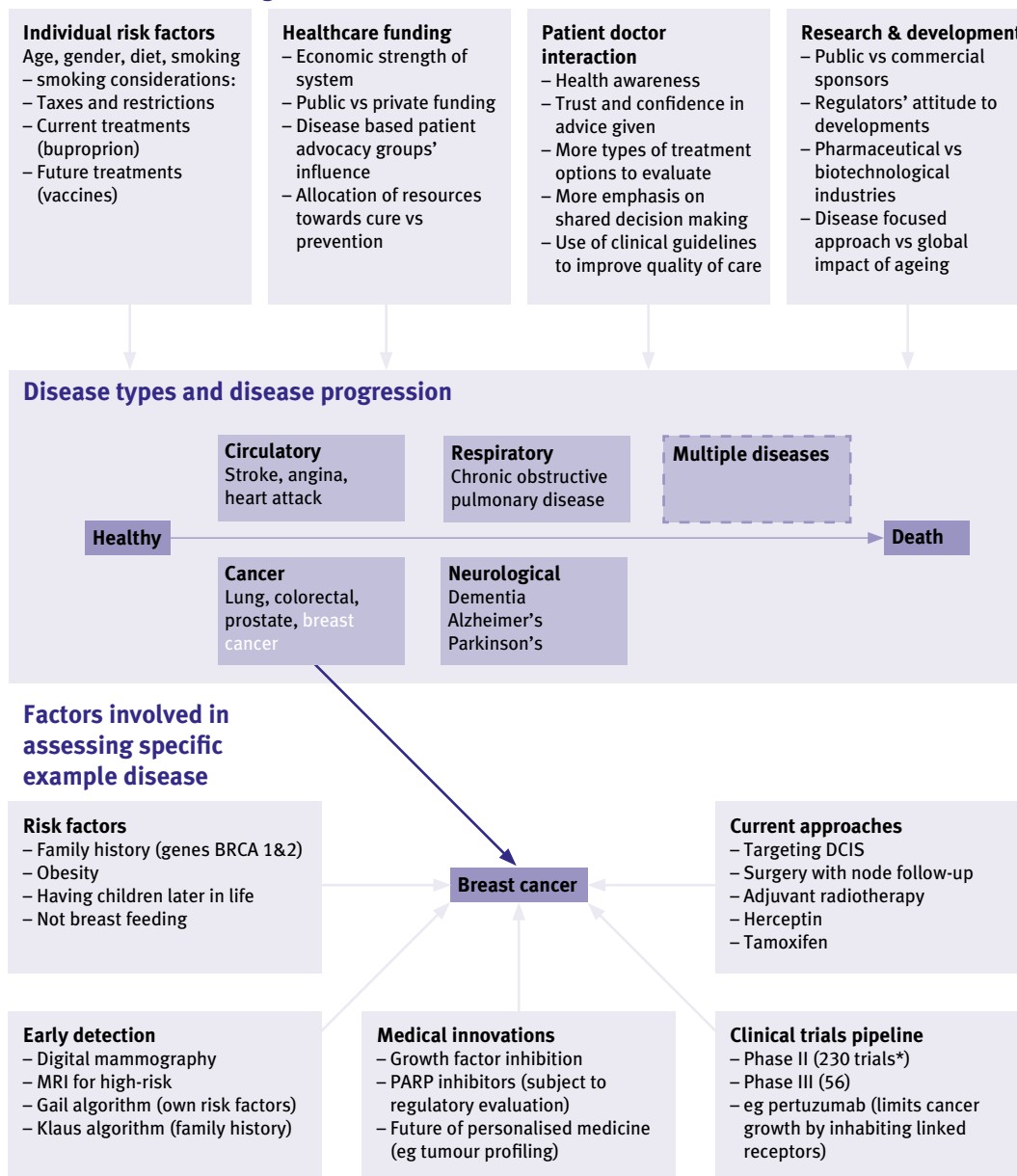
There are many approaches that can be adopted to quantify the impact of such scenarios. One way would be to consider changes in clinical guidelines, for example, in the treatment of hypertension using combination therapies, and to use risk algorithms such as QRISK developed by the University of Nottingham to quantify the impact of such changes in the general population.

Further illustration with breast cancer

A life course model must include the healthy population, and so such models will need to develop different future scenarios for diagnosis and survival rates. Figure 1 provides an overview of some of the many considerations for building a forward-looking, disease-centred model, using breast cancer to illustrate the process.

Figure 1

General drivers to diagnosis and survival



Women are having their first period earlier, having fewer children, having them later in life, and are widely exposed to the contraceptive pill and hormone replacement therapy. All of these non-genetic factors increase the risk of breast cancer. In the future, the age-specific chance of women developing breast cancer is likely to remain stable. Yet, overall, diagnosis rates may increase by extending screening programmes to women of younger ages. Investigations of younger women are likely to focus on those who might have a particularly high risk of breast cancer, as identified by risk algorithms developed by researchers Mitchell Gail and Elizabeth Claus.

Attribution analysis highlights that the major contributor to improved breast cancer survival rates was the drug tamoxifen, with only a relatively minor contribution from screening programmes. Further survival improvements are expected to be driven by a combination of screening and intervention in a systematic manner.

There have been encouraging developments in more specific treatments for breast cancer such as herceptin, either for direct treatment of cancer or for use in conjunction with surgery. We are on the threshold of a new era of personalised medicine, where the most appropriate treatment is selected based on the patient's DNA. However, we always need to be mindful that highly-valued improvements in both quality and duration of life for affected individuals may have a very limited impact on the life expectancy of the entire population. Focusing our efforts on earlier stages of disease may be more cost-effective.

“Considering a number of alternative scenarios for each disease both in terms of diagnosis and treatment, and how these interact with different scenarios for other diseases, will help achieve an understanding of potential uncertainty in future experience.”

It is important to add that a single scenario is insufficient for our purposes, no matter how well this scenario has been described and assessed. Considering a number of alternative scenarios for each disease both in terms of diagnosis and treatment, and how these interact with different scenarios for other diseases, will help achieve an understanding of potential uncertainty in future experience.

Managing future uncertainty

Although the future is uncertain, a key benefit of predictive approaches is that they can increase confidence in the pricing and funding of future retirement income solutions. Holding longevity risk, however, continues to be a major challenge for pension funds, insurers, and governments. Better methods need to be developed to share the risk appropriately.

It should be clear that scenario development and assessment is a continuous and long-term project. The size of such a project may mean that it would be beneficial for various interested parties to act collaboratively to pool resources and to educate journalists and capital markets, as well as others in the public arena, as to the benefits of shared research.

“Governments, employers, insurers and reinsurers must work together to achieve a long-term, sustainable infrastructure for retirement provision.”

A predictive, forward-looking mortality model is just part of the solution to the potential financial problems caused by dramatic increases in life expectancy throughout the world. Governments, employers, insurers and reinsurers must work together to achieve a long-term, sustainable infrastructure for retirement provision. An improved understanding of what will influence future mortality will help to drive a UK financial policy framework that ensures sustainable provision for our increasingly longer lives.

Meeting the needs of the consumer

The cost challenges of rising longevity are extensive and uncertain, particularly in the long-term, as the welfare system, largely based on the Beveridge Report published in 1944, is rolled back and consumers are forced to consider self-responsibility. When the Beveridge Report was published, UK government statistics show that the population was 47 million people, compared with approximately 62 million today, with a very different demographic mix and workforce.

Despite the possible impact of migration on population mix, it is inevitable that the State will need to continue to withdraw some benefits and services, and to focus provision on the most needy. Over time, this withdrawal should present great opportunities for financial services providers and, specifically, for insurers to manage risks. As policy emerges, although they are often unclear of the detail, consumers are much more aware generally now that change is taking place and that it will be largely their responsibility to provide for themselves.

“ Research conducted in July 2011 by Swiss Re shows that, while 47% of consumers today believe that it is Government’s responsibility to provide their income in retirement, when asked who will be responsible in ten years’ time, this falls to 27%. ”

Research conducted in July 2011 by Swiss Re shows that, while 47% of consumers today believe that it is Government's responsibility to provide their income in retirement, when asked who will be responsible in ten years' time, this falls to 27%. The research shows similar findings across most "benefits" where the State currently plays a key role as a provider such as only 35% of consumers thinking that the State will be responsible for nursing care in ten years' time compared with 80% today.

Changing customers

Despite funding issues, further education is likely to become a natural extension to schooling, with the result that people will be entering the labour market later, often burdened with student debt. The traditional trigger points when people consider their financial needs, such as marriage or house purchase, are also changing or, at least, being deferred. While insurers and other providers may understand why consumers should begin to save or purchase protection cover as early as possible, the reality is that affordability is an issue for many. People are faced with a number of different financial priorities such as paying down student debt, financial protection against death or disability or beginning to save for a rainy day or for retirement, as well as daily living costs.

People are having children later in life, another trigger to purchase financial products, and this will defer demand for cover. Increased longevity will mean also that many people may need to care for their own parents as well as their children, even when they are no longer working full-time. Protection cover to older ages will have implications for the assessment of risk by underwriters and a need for more products to go beyond the traditional ages of dependence seen today.

We may also see greater emphasis on protecting inter-generational transfers of assets on death against inheritance tax by using whole life policies. This may be balanced by the need to make transfers earlier, for example, to cover a child's student debt or to provide a deposit on a first home. More specifically, assets such as the home may be needed to top up retirement income through the use of equity release.

Clear and unequivocal messages

If consumers are to move from having this greater awareness of their responsibilities to the next step, taking action, clear and unequivocal messages will be essential – not least from government. Many reports have shown the low level of financial capability in the UK. Clarity is, therefore, key if this is ever to change.

Once the Retail Distribution Review comes into effect, a greater focus on advising higher net worth customers may result in many low- to middle-earners being unable to access advice through the traditional distribution channels on which so much insurance business has relied on historically. Indeed, these channels are seen as less relevant by younger generations, more comfortable using technology to seek out information and to purchase products. Our consumer research shows that younger generations rely on informal sources such as friends and family and social media to verify their actions. Harnessing this power effectively will be essential to future success in reaching these generations.

Auto-enrolment into qualifying pension schemes will help increase participation in retirement funding. Initially, however, participation may be seen as a “grudge purchase” by both employers and employees. Auto-enrolment should over the longer term, create good savings habits, leading to greater awareness of financial products in general which could lead to further purchases. The attitude of employers will be critical to success and we should not ignore the potential power of behavioral economics in the workplace. For example, respected peers may act as role models to stimulate and encourage engagement and participation.

The need to increase the State Pension Age is now largely accepted and Government intervention, removing the ability to retire employees solely on grounds of their age, will mean that we are likely to have a more mature workforce as those who wish or need to do so are able to continue working. This is both welcome and necessary, although, where employers provide group risk benefits such as death in service cover or long-term disability income, as the average age of scheme membership goes up, we might expect some increase to the cost of cover.

“Products will need to incorporate flexibility to allow those who wish to draw on their funds to do so. This may include more flexibility around using financial products to help meet the costs of social care, for example, by varying income when the individual meets agreed criteria linked to the provision of care.”

For others, retirement will be a phased process, perhaps over many years, as people may move from working full-time through to part-time working before reaching the point where they stop working completely. Products will need to incorporate flexibility to allow those who wish to draw on their funds to do so. This may include more flexibility around using financial products to help meet the costs of social care, for example, by varying income when the individual meets agreed criteria linked to the provision of care. The Dilnot Commission investigation into funding social care in England has highlighted the important role that products written within the pensions framework could play in contributing to care costs.

Currently, no market exists for pre-funding care costs using protection insurance. This should be addressed and is likely to mean that there will be a greater emphasis on “lifetime benefits” using protection products designed to meet the need for disability-related income or lump sum payments, or a mixture thereof, throughout life. This will be very different from many of our current product models, often designed to terminate at a likely retirement elected many years before and based on typical retirement dates when the policy is taken out.

As products and propositions are designed to meet the need for greater self-sufficiency, the latest data will be key to create a pricing basis which is attractive to consumers, while providing a viable shareholder return. Understanding the drivers of increasing longevity, both from a financial and a scientific point of view, will be essential to achieving this. What is more, it will be key that all sectors of the market come together, with government, to deliver the simple messages needed to turn awareness into action and fund our longer lives.

The three scenarios

In the previous section, a number of pre-eminent authors identified significant and interconnected risks related to demographic change, which could have severe implications for long-term wellbeing and prosperity. By pulling together some of their key conclusions, it is possible to outline a few simple scenarios.

Before setting out these narratives a few words of caution are necessary. There are a number of assumptions that underpin the following scenarios which, if altered, could dramatically affect the outcomes of our imagined worlds.

First, we make the assumption that global longevity continues to rise over the coming decades. This is far from controversial, but it may not ultimately ring true. In today's globalised world, with international travel connecting lives across the globe, human disease can spread, quickly becoming a pandemic, affecting millions of people worldwide. There have been near misses in our recent past including Sars and Swine Flu, and the world must remain vigilant for the next possible outbreak.

Second, we assume that there is not enough immigration of young people from the developing to the developed world to ensure that countries have a balanced demographic profile with an active labour force. This may not be the case – in response to demographic change, governments may actively promote immigration, though for the time being promoting increased immigration is unlikely to improve a government's prospects of re-election – particularly in the US, Western Europe and Japan. Also, as the expert authors argued earlier in this report, the scale of immigration necessary to redistribute the global demographic make-up would need to be extraordinary.

Third, we assume that whilst the sovereign debt crisis persists for a while, it does not end with major European economies defaulting on their debts. The long-term economic environment for many Western countries is characterised by stable stagnation (low growth, relatively high unemployment) rather than severe and sudden crises leading to a depression. Our assumption is based on the central scenario depicted in our socioeconomic report within the Future Risk series published earlier in 2012. In reality, a number of possible economic futures could face us with significant short term uncertainty particularly around the sustainability of the Eurozone and the political wrangling over the US debt ceiling (the so-called “fiscal cliff”).

And finally, it should be noted that the causation implied by our scenarios may also be inaccurate. The number of variables involved and the complex relationships between them are so complex that, for simplicities sake, it is necessary to exclude many possible permutations and interaction effects that could lead to futures completely different to the ones envisaged here. Therefore, rather than being used as concrete forecasts for future planning, these scenarios should instead help guide decision makers into considering how they might react as different possible futures unfold.

Scenario 1 – Upside

Government policy

In our upside scenario, risks associated with ageing across the developed world are mitigated by the actions of governments. Policymakers ensure that state pension age rises in line with rising longevity and they remove mandatory or default requirement age. This means that firms are unable to force their employees into retirement after they reach a certain age. And governments legislate for greater re-skilling of the labour force and promote more flexible working for older members of society. Together, these policies go some way to addressing some of the problems posed by population ageing – helping to reduce the dependency ratio and by implication, limit the burden of old age spending on the public purse.

In paying for the elderly, governments follow the principles set out by Andrew Dilnot²⁵ that some proportion of the increase in age related spending should fall on those due to benefit the most (i.e. the current elderly population) improving the perception of intergenerational fairness. Governments will not stop here though – on the international front, they take action to mitigate some of the risks posed by those countries in the developing world whose populations are growing the fastest. For example, countries like Brazil and Turkey are encouraged to play a stronger role in the decisions made by international institutions which may help to ensure more effective frameworks for resolving disputes between states and responding to global crises.

Role of employers and insurance

Government policy will only be able to go so far in defusing the longevity time bomb. Insurers will also be of crucial importance in terms of helping to deliver an adequate retirement income for individuals. In the first instance, insurers must remain solvent or else they will not be able to pay out on their longevity-linked commitments.²⁶ In our best case scenario, insurers are able to maintain solvency by appropriately modelling and pricing longevity risk. Through a multi-stakeholder effort they build robust scenarios of the future, maintaining close working relationships with specialists in areas like the biosciences which can provide insights into how far life extension might shift over future generations. Insurers also develop means to spread longevity risk to capital markets through financial instruments like “longevity bonds”.²⁷

In an economic environment conducive to low investment returns (assumed across all scenarios), fund managers are able to protect investors from downside risks in financial markets (i.e. falls in the value of share prices and other financial assets) through the use of hedging and by controlling policyholders’ choices for investments (for example, insurers might bolster the viability of the “default fund” and reduce the number of alternatives that are available).²⁸ And perhaps most importantly of all, insurers are successful in communicating the importance of saving for the future to the general public. Indeed, in the best case scenario, communications from government and the insurance industry about the need to save are buttressed by employer-led efforts to raise awareness.

²⁵ Andrew Dilnot (Chair) Commission on Funding of Care and Support, Final Report, July 2011. The report argues that to fund a cap on the cost of long-term, a specific tax increase targeted at those over state pension age, who would benefit the most from the reforms, may be appropriate

²⁶ An example of this would be an Equitable Life-type event where pensioners thought they could rely on the insurer for their retirement income, when actually the insurer got itself into a position where it could not ultimately meet its long-term liabilities due to poor prudential management

²⁷ Longevity bonds are where the seller of longevity risk pays a premium to investors and, in return, investors would assume the risk of losing some or all of their investment if future improvements in life expectancy are higher than at a pre-agreed rate. See Swiss Re (Sept 2012), “A Mature Market: Building a Capital Market for Longevity Risk”

²⁸ See Geneva Association Report (June 2012) “Addressing the challenge of global ageing – funding issues and insurance solutions”, eds. Patrick M. Liedtke and Kai-Uwe Schanz, p.127

Employers make retirement and pensions issues a cornerstone of employee communications rather than viewing pensions as a financial and administrative burden. And in this instance, financial intermediaries play a key role in providing solutions and support for different types of businesses and their staff.²⁹

Overview

In short then, due to the choices made by governments, insurers and businesses, global ageing is not the source of the next sovereign debt crisis, or financial sector scandal. In fact, insurers are able to remain profitable whilst providing their clients with adequate sources of income in retirement. A final element worth noting is the choices made by individuals. Ultimately it is the general public who have to make the decision to plan for the future and save for retirement – government, industry and employer prompting can help but can only go so far. In the best case scenario, a savings culture develops and flourishes – managing personal finance is seen as important as doing the “weekly shop” has become to UK consumers.

²⁹ For an examples of how financial advisers can support pension reform in the UK see CII (June 2012) “Advice Needed! A research report into small firm’s readiness for the workplace Pension Reforms”

Scenario 2 – Central

Government policy

In the central scenario, governments take some actions to mitigate the risks associated with global ageing but not the full range of actions undertaken in the upside scenario. For example, policymakers ensure that the state pension age increases in line with longevity and remove the default retirement age but make little progress on re-skilling the labour force or promoting flexible working in old age. As a consequence governments succeed in reducing the future burden of age-related spending on the government purse³⁰ but not to the same extent as in the upside scenario. Age related liabilities are, therefore, a key driver of fiscal deficits and, consequently, the overall level of government debt.

In paying for the elderly, governments do not follow the principles laid out by Dilnot. The working population, therefore, pays for the elderly through taxation. There is an increased perception of unfairness between the “haves” and the “have nots” generation though this is eased somewhat through the bequests that the older generation are able to leave for their children – aided by some forward planning on the part of households. On the international front, developing countries are increasingly included in international strategic discussions, but old institutional structures like the UN’s Security Council with its five permanent members remain out-dated and unable to act as effective arbiters of peace or deal swiftly with the latest international crises.

Role of employers and insurance

In some cases, insurers are able to deliver an adequate retirement income for some individuals but for many people their occupational pension combined with conventional saving and state benefits will not provide enough income for a comfortable retirement.³¹ This is partly because savings are lower, partly because of greater mispricing of longevity risk and partly because fund managers are less able to control for volatility in asset prices. Lower savings lead to a smaller pension pot, mispricing leads to the sale of some annuities providing less than optimal annual pension income and increased volatility means that some pension funds will fail to produce solid investment returns. However, insurers remain solvent as their offerings err on the side of caution, careful not to promise future income streams that they cannot deliver. And insurers have reason to be particularly cautious about longevity risk as a market for instruments such as “longevity bonds” fails to develop. Longevity risk is, therefore, confined to the insurance and reinsurance sectors, ultimately to the detriment of the consumer.

Governments and insurers have some limited success in communicating the benefits of saving to the public. Volatile returns and depressed levels of pensioner income put some people off from setting money aside for the long-term and all stakeholders are less successful at engaging with the public on saving for the future. In particular, employer’s views about pensions are mixed. Some employers see pensions as a vital component of their offering to their workforce and therefore provide help and support to their employees on saving for retirement. But there are also employers who view pensions with a certain degree of disdain – annoyed as, in their opinion, staff benefits like matched employer contributions act to drain bottom line profit. This last group of firms do not heavily engage in the process and, consequently their employee contribution levels tend to be low (if they even contribute at all).

³⁰ In actual fact, in this scenario age-related spending still increases as a proportion of GDP, but, because of the government’s policy changes (i.e. raising the retirement age) the burden is not as significant as it otherwise might have been

³¹ Adequacy of income in retirement is a rather subjective measure, but one rule of thumb says that it is equivalent to roughly 70% of pre-retirement income

Overview

In short then, in the central scenario, there is mixed success in terms of mitigating the risks of an ageing developed world or a young burgeoning developing one. Reforms to pension age help to reduce the future burden on public spending but not enough progress is made on re-skilling to ensure that ageing is not a significant drain on government resources. And this is exacerbated by the fact that occupational pension saving remains subdued – deterred by the failure of the industry and other stakeholders to fully engage consumers and provide adequate protection from financial market risks. Pensioners are therefore worse off than in our best case scenario and so are governments.

Scenario 3 – Downside

Government policy

In our worst case scenario, as a consequence of government inaction, global ageing causes significant problems. Policymakers make some changes to the pension age but do not raise it in line with rising longevity. Similarly, countries do not remove mandatory retirement age or concentrate on ways to re-skill older workers and incentivise more flexible working for the older cohort. This inaction means that unless governments make significant cuts to old age benefits (such as basic state pension in the UK) then, assuming all else remains equal, old age spending will drive ever increasing fiscal deficits. Indeed, in this case, the ratio of debt to GDP will significantly rise posing a serious risk to the solvency of governments across the developed world. And a significant burden of paying for the elderly is placed on the working-age population with the potential to greatly increase political and social tensions between the generations.

Role of employers and insurance

Governments come under intense pressure from their populations not to reduce old age benefits because few citizens have large enough private pension pots, or regular savings to live adequately in retirement. This failure to save is partly because of mispricing on the part of the insurance industry. Equitable Life type failures occur with increasing regularity, as insurers, not taking proper account of the latest developments in demography, medicine and biosciences, fail to build a deep understanding of the drivers of longevity risk. In some cases then, policies are underpriced and insurers are unable to keep their commitments, whilst in other cases, insurers over compensate and price themselves out of the market. Given the failure of the industry to price longevity risk, it is unable to spread the risk to capital markets since investors remain highly wary of any form of financial instrument linked to this type of risk. All these effects damage public confidence in the industry, deterring consumers from investing in a pension scheme.

The above problems with the insurance industry also deter employers from engaging with pensions on behalf of their staff. They do not spend time and effort communicating the importance of saving for the future and view occupational schemes as a financial and administrative burden on their organisations and, generally speaking, a waste of time for their staff. Individuals do not therefore take advantage of the matched contributions or tax benefits common to occupational schemes across developed countries, preferring instead to invest in flexible savings vehicles which do not “lock away” income for the future. The net result is poor retirement income, which forces individuals to stay reliant on the state to pay for day to day living expenses.

Collapse in global governance

With the developed world facing a fiscal crisis, these countries will need to be bankrolled by the developing world in order to balance their books, ideally through export led growth fuelled by increased overseas consumption. Unfortunately in the worst case scenario, as a result of a failure to redress the weaknesses of global institutions, and particularly a failure to recognise the importance of rapidly growing countries (in terms of population and GDP) within those institutions, governments around the world are unable to come to an agreement about how best to resolve the coming age-related debt crisis. The result is increasing friction between the stagnant West and the rest, with potentially dire consequences for international relations. Indeed, given the rate of ageing amongst much of the developing world, these countries become less and less able to support the ageing developed world.

Overview

In summary, the downside scenario ends up with Western governments facing substantial fiscal deficits and rising government debt as a consequence of failing to address the risks related to their ageing populations. Governments are not solely to blame for this situation. As a result of the insurance industry failing to understand longevity trends, insurers are unable to adequately price longevity risk and therefore offer their customers a good deal. This seriously damages confidence in the industry and the ability of the private sector to take on some of the burden as the public sector seeks to limit its exposure to rising life expectancy. In turn, the developed world's fiscal predicament coupled with failures to reform international governance, results in increased international tension.

Conclusion

Demographic change is one of the most significant risk drivers facing the world today. But unlike many of the other risks discussed over the course of the centenary series we can be reasonably sure, barring any international war or pandemic, the general trajectory as well as some of the implications if nothing is done to mitigate the risks it poses. With the exception of a few developing countries, the world will grow older over the coming decades. This is likely to place a significant burden on government expenditure as well as pose a challenge for the insurance industry to make good on their longevity linked commitments.

But at the end of it all is the most important stakeholder – the general public. Longer life must be celebrated rather than feared in the years ahead. In future, the elderly should not have to worry about how they are going to afford to eat and stay warm from day to day, or what might happen if they or their partner is in need of long-term care as a result of illness or disability. In order to help ensure peace of mind, they must be able to secure something approaching an adequate income after they have finished the working part of their lives.

According to the life cycle theory of saving, people will aim to smooth consumption during their life time, saving during their working lives when disposable income is high and consuming everything during their retirement years. They are able to calculate how changes to things like interest rates and inflation will affect their income from now until their dying day. In reality, this is a very rough approximation of what really happens; some people enter their retirement years already in debt whilst others wish to hold onto a proportion of their wealth to provide for their loved ones after they have passed away. And no one, particularly during uncertain economic times, is able to perfectly calculate future consumption over the next 20 or 30 years.

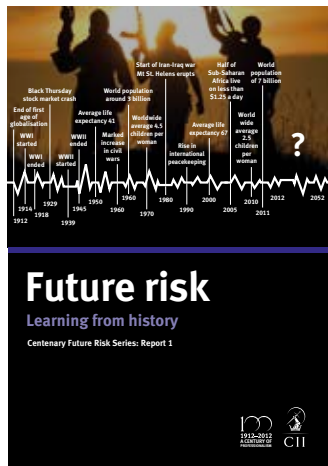
In fact, as is the case today, in the future, people will need to be convinced of the need to save and confident that the savings vehicles they choose will deliver on their promises. This report has shown how governments, insurers and employers all have a role to play in this regard. Part of the solution is simple communication about the benefits of saving – the need to put something aside for the long-term. But arguably the most important element is credibility of policy on the part of government and credibility of future promises on the part of the insurance industry. For example, if the general public does not believe that state pensions will be linked to rising longevity, then why would anyone make any extra provision for longer retirement? Similarly if the public are not convinced that insurers and asset managers will control for asset price volatility and deliver a decent income in later life, why would they bother to save into a pension scheme at all?

Both governments and the insurance industry must fulfil their sides of the bargain so that we can have a fair contract that is suitable for 21st century society. To use the famous expression from Franklin D. Roosevelt, there needs to be a “New Deal” for providing for the elderly, which includes consistent and predictable government and regulatory policy, and increased competence and transparency across the insurance industry. And to work, the deal must have real buy-in from all stakeholders, at all levels of society. It will be a hard bargain to strike and to commit to, but without it, governments across the developed world risk becoming the “zombie banks” of the next 100 years, only remaining solvent because they are shored up by credit from increasingly impatient developing world economies who will themselves grow older and less able (or willing) to bankroll the West.

Next report in the series

The last and final report in our series will take a look at all of the risks covered over the course of this year’s publications and explore some of the relationships between them. It will also consider some of the key recommendations that have been common across all of the reports, and this will be illuminated through further survey evidence into the risk perceptions of the general public as well as CII members.

Previous reports within the Future Risk series



Future risk: learning from history

The first report within our centenary series reflects on past trends and their potential implications for future risk as well as discussing some initial findings from a global survey into the risk perceptions of members of the public from across the globe. It sets out the methodology for the entire series and identifies themes for further investigation.

Report accessible via:

<http://www.cii100.com/wp-content/uploads/2012/Future%20risk.pdf>



Future risk: social and economic challenges for tomorrow

The second report in the centenary series focuses on some of the big socioeconomic risks identified by the first report. Utilising expert analysis from George Magnus of UBS Bank and David Smith of The Sunday Times amongst others, we outlined three possible socioeconomic scenarios and their potential implications for the insurance industry. We then discussed how the industry can play a key role in determining a better future.

Report accessible via:

<http://www.cii.co.uk/knowledge/policy-and-public-affairs/articles/future-risk-social-and-economic/17413>



Future risk: Climate change and energy security

The third report in the centenary series focuses on climate change and energy security. World leading experts including the Government's Chief Scientific Adviser, Professor Sir John Beddington, and the International Energy Agency's Chief Economist, Dr Fatih Birol outline what the future might hold. Again we use the expert analysis as the basis for the construction of three scenarios and their implications for the insurance sector.

Report accessible via:

<http://www.cii.co.uk/knowledge/policy-and-public-affairs/articles/future-risk-climate-change-and-energy-security-global-challenges-and-implications/19188>



Future risk: How technology could make or break our world

The fourth report in our centenary series looks at risks related to technology. Amongst other risks, it considers technological “black swans” – low likelihood, high impact events such as the failure of large scale IT systems controlling grid networks. The report also discusses the importance of continuing technological innovation and how the insurance industry can support this.

Report accessible via:

http://www.cii.co.uk/media/3691513/future_risk_report_no_4.pdf

Who to contact

CII

Ben Franklin

Policy and Research Manager
Chartered Insurance Institute
20 Aldermanbury
London
EC2V 7HY

Email:

ben.franklin@cii.co.uk

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The Chartered Insurance Institute 42–48 High Road, South Woodford, London E18 2JP
tel: **+44 (0)20 8989 8464** email: **customer.serv@cii.co.uk** website: **www.cii.co.uk**

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