STRATEGY

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The human tide

An Australian perspective on demographics and security

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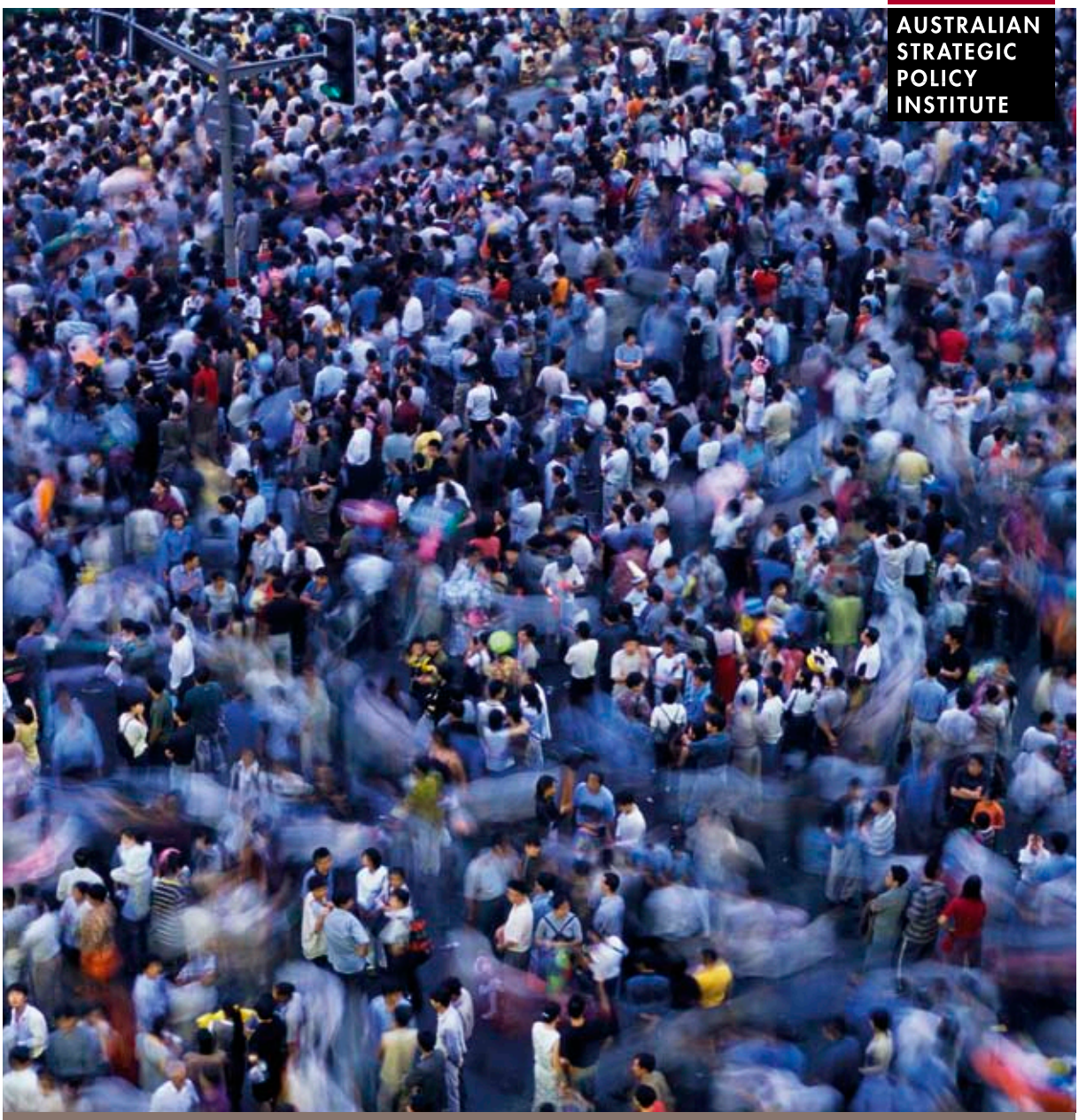

June 2009

Mark Thomson

Prior to joining ASPI, Dr Mark Thomson held a number of positions in Defence working in the areas of capability development and resource management. In 1999 he was Political Military Adviser to Major General Peter Cosgrove during the INTERFET operation. Prior to his time with Defence, Mark held a series of academic research and teaching positions in theoretical physics.

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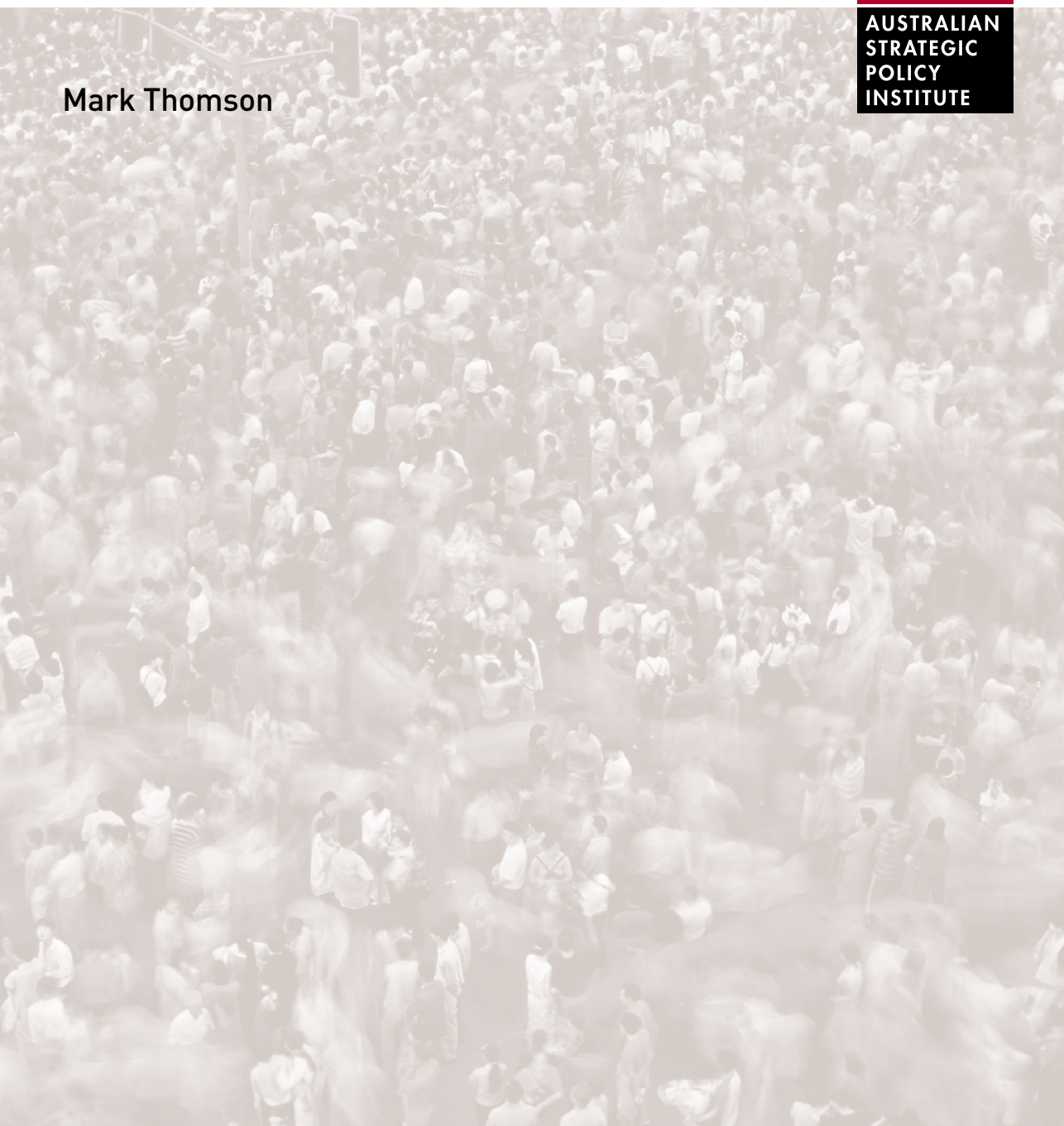

First published June 2009

Published in Australia by the Australian Strategic Policy Institute

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Thomson, Mark, 1959–

Human tide [electronic record] : an Australian perspective on demographics and security / Mark Thomson.

ISBN: 9781921302435 (pdf)

Bibliography.

National security—Australia.
Security, International—Australia.
Human geography.
Emigration and immigration—Australia.
Australia—Defenses.

355.033094

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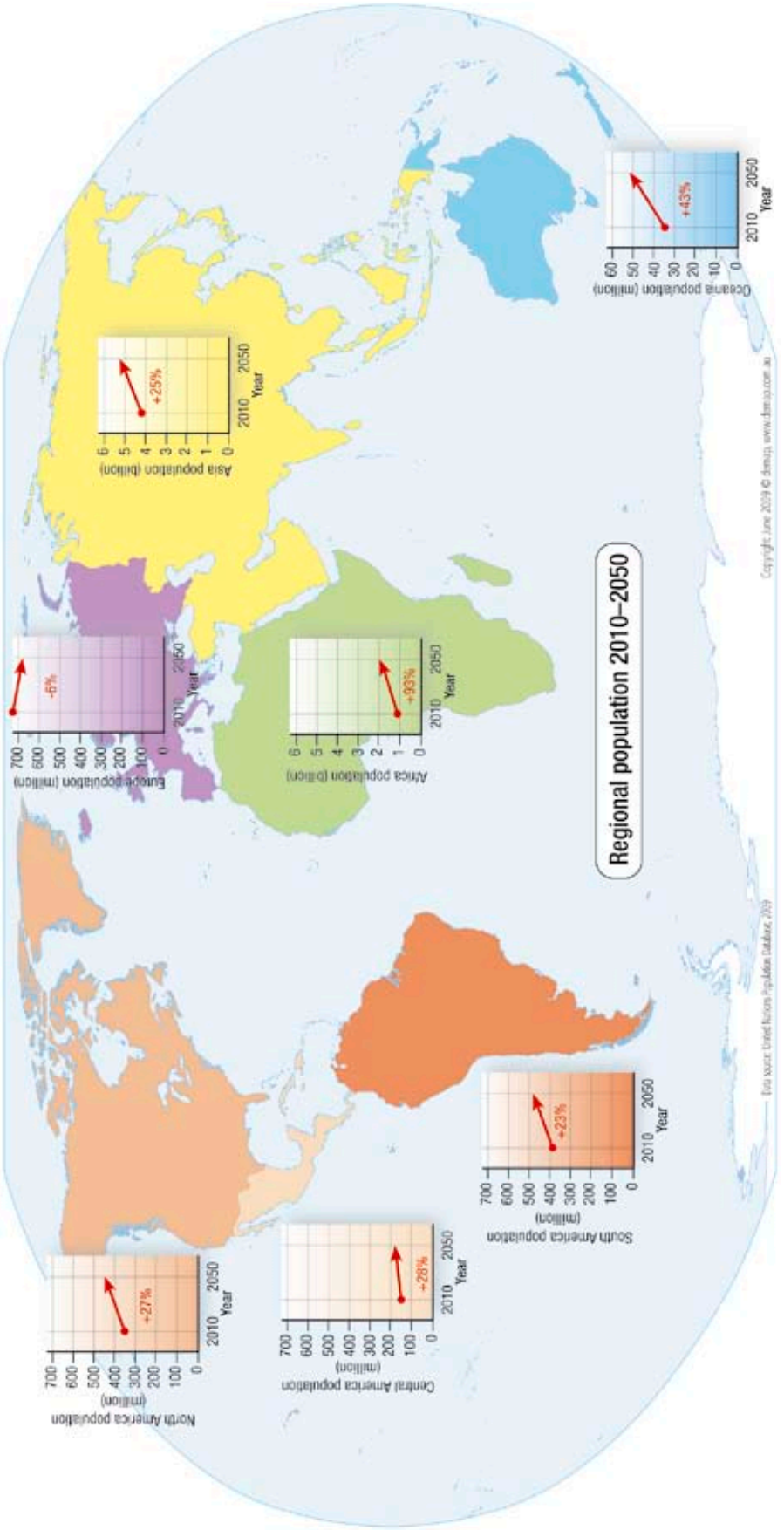

Regional population 2010–2050
Asia population (billion)
+25%
Europe population (million)
-6%
Africa population (billion)
+93%
Oceania population (million)
+43%
North America population (million)
+27%
Central America population (million)
+28%
South America population (million)
+23%
2010
2050
Year

Executive Director's introduction

Perhaps the greatest challenge to formulating defence and strategic policy is that the future is inherently uncertain. This was true a century ago, and it will be true in a century hence. Yet, somehow, decisions must be made; often very costly decisions. For example, the government's new Defence White Paper, *Defending Australia in the Asia Pacific century: Force 2030*, sets forth decisions that provide 'a significant strategic hedge against future uncertainty' at a cost more than $300 billion over the forthcoming decade alone.

While the future can never be rendered certain, the degree of uncertainty can hopefully be reduced by looking at the past to discern the factors that will shape the future. This ASPI *Strategy* report attempts to do so by looking at the interrelated dynamics of human population and economic development.

Such an approach cannot pretend to take into account the myriad of cultural, political, and technological complexities that will determine the future in detail. But the evolving demographics and economics of countries is the landscape upon which the future will play out. What's more, the sheer momentum of population growth and economic development gives us hope of being able to look some way into the future. In any case, given the massive cost of hedging against future uncertainty, we have every reason to try to understand as much as we can about what lies ahead.

Although much of the report is global in scope, every attempt has been made to isolate those issues relevant to Australia and its interests. As it happens, our location on the periphery of Asia and the Southwest Pacific puts us in the box seat for some of the more interesting, and potentially more challenging, developments in the years ahead.

This *Strategy* report includes more extensive notes and references than has been our practice in the past. In part, this reflects the technical nature of some of the material. In equal measure, it is our response to the increasing use of ASPI products by tertiary students. More generally, the notes and references are a resource for any of our readers who might want to delve further.

However, to preserve the readability of the text, neither footnotes nor endnotes have been employed. Instead, a self-contained section at the end of the report contains notes for each chapter describing sources and suggested further readings. To further facilitate access to background material, the notes and references are available on our website with hyperlinks to sources wherever possible.

A number of academics and private individuals were kind enough to offer comments on an early draft of this report, as did the Departments of Defence and the Treasury. My thanks goes to all those who provided comments and thereby helped improve the clarity and accuracy of the final product. Of course, this does not imply endorsement or agreement by Defence or Treasury of anything contained in this report.

Also my thanks to Dr Mark Thomson, who is Director of ASPI's Budget and Management Program and the author of this report.

Finally, the views expressed in the following pages are not to be taken as expressing the views of ASPI as an institution. Responsibility for any views lies with me as Executive Director and Dr Thomson.

Peter Abigail
Executive Director

Executive summary

As Captain James Cook was exploring the globe in the late 1700s, a profound transformation was gaining momentum back in England—man and beast were being replaced as agents of motive power by steam and machine.

In the twelve score years since then, England's productivity has grown steadily and standards of living have risen roughly tenfold. This profound economic transformation has been attended by a demographic transition that has seen families become smaller, lives become longer, and the population grow from 6 million to 50 million.

Europe, North America and Japan have all undergone similar transformations, and China and India are doing so today. In fact, apart from some isolated communities, all of humankind is now some way down the path that England laid out.

The econo-demographic transition of countries from poverty to prosperity has been a driving force of history over the past two centuries, and is set to remain so for the remainder of this century. It evolves the relative power of nations, it reshapes countries from within, and it determines the demands that we make upon the environment.

So far, the planet's capacity to sustain human development on an ever larger scale has proven to be robust. Over the past sixty years, the world's population has grown by 176%, from 2.5 billion to 6.9 billion, yet basic measures of human wellbeing have improved substantially—infant mortality has fallen from 14% to 5% and average life expectancy has grown from 48 to 70 years. Those sorts of improvements are expected to continue until at least mid-century—in part because the world's population is projected to grow by only another 33% over that period.

Looking out to the end of this century, the situation is far less clear. The growing scarcity of cheap energy from fossil fuels will force a shift in economic patterns as profound as that heralded by the industrial revolution—around the time when many scientists expect anthropogenic climate change to begin to have a serious impact.

Long before any of that happens, there will have been challenges enough from changes already underway.

Developing countries like China and India are taking hundreds of millions of low-productivity workers and putting them into higher productivity jobs. In the process, the economic gap between the countries of the developed and developing worlds is changing. Because of their enormous populations, some developing countries will relatively quickly reach absolute economic parity with established powers like Germany, Japan and the US—even as their own people remain relatively poor.

This shift will be accelerated by the ageing of populations in the developed world as the postwar baby boom generation slips into retirement and fertility rates remain low.

The result will be a steady shift of power from the West to the East and from the rich to the poor. This will have profound impacts for a country like Australia. In the past, times have been good for us because our allies and rich friends have been in charge. In the future, however, the rich world of which we're a part will increasingly have to negotiate with powerful states representing the interests and aspirations of vast numbers of relatively poorer people.

At the same time, the shifting balance of economic power will lead to a corresponding shift in strategic power. And, while nothing is preordained, the rise of new powers has been a recurrent cause of conflict from at least the time of the Peloponnesian wars. For Australia, the critical question is whether the US and Japan can peacefully accommodate the rise of China in the decades ahead.

Setting aside geopolitics, the ongoing demographic transition of countries will result in continuing security challenges in the decades ahead. While economic growth will deliver improved standards of living to most of the world's inhabitants, the volatile and vulnerable will be left behind. In poorly developed countries, conflict correlates strongly with scarcity, high youth populations and rapid urbanisation. In most places the factors that predispose to instability are moving in the right direction, but it's the exceptions that matter.

Sub-Saharan Africa, Central Asia and parts of the Middle East all have demographic features and economic prospects that bode poorly for their future stability. Some, like Afghanistan and Pakistan, are of strategic importance to our allies and us. Even more critically for Australia, East Timor and parts of Melanesia have similarly poor prospects for the future. With fragile and increasingly populous states like this on our doorstep, our humanitarian and strategic interests are unambiguously engaged.

Recommendation 1: Make family planning a priority for Australian aid.

It's not a law of nature that a country's population must increase on the way to prosperity. With good policies and active intervention, there's no physical reason why the birth rate can't be lowered more quickly as prosperity takes hold. For countries with scarce resources, constraining population growth rates delivers both a humanitarian and security gain.

Recommendation 2: Redouble our efforts to assist the immediate region.

In the absence of stronger and more determined action, the future in many parts of our immediate region is bleak. Australia should expand its program of engagement to help our neighbours build economic capacity, promote trade, strengthen governance and bolster security. Some good progress has been made over the past several years, but more is needed to guard our strategic and humanitarian interests in our near neighbourhood.

Chapter 1

DEMOGRAPHICS AND DESTINY

For almost as long as humankind has lived on Earth, life has been harsh. Quite apart from famine, plague and war, most humans have endured a standard of living little better than subsistence until relatively recently. What is surprising is that this sad state of affairs continued despite epoch-defining advances in agriculture, technology and political order. The reason was simple: for every advance in human knowledge there was a compensating increase in human population that stretched resources back towards subsistence levels. Even the addition of further resources through territorial expansion only brought a temporary respite before the population grew to take up the available slack.

The Malthusian trap

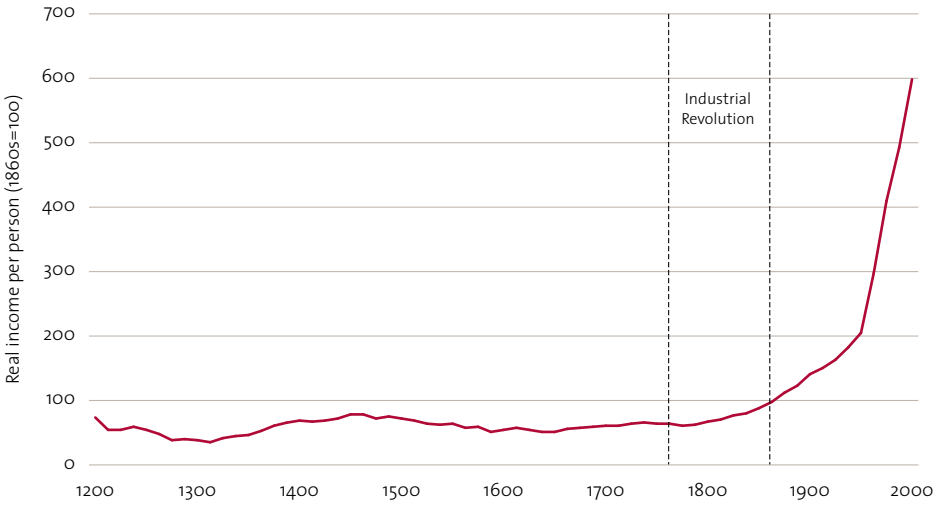
It was to the fundamental problem of population and prosperity that Englishman Thomas Malthus addressed his *An essay on the principle of population* in 1798. Malthus, a mathematician by training and one of the founders of what is now called economics, came to a fatalistic conclusion. The biological capacity for humans to increase in number by geometric proportions would always be checked by the more modest rate at which food production could grow. Hence, the vast bulk of any society was destined to live at or near the level of subsistence.

Malthus' work was highly influential. Not only did it inform Darwin's thinking about competition in nature, but it led to the commencement of the modern census and shaped Britain's policy on poverty for a good part of the nineteenth century. Malthusian economics has even been blamed for Britain's inadequate response to the Irish potato famine of the 1840s.

But Malthus was wrong, as events already underway as he drafted his seminal essay were to prove. Malthus was admitted to Cambridge in 1784, the same year that James Watt completed the final patent for his steam engine. By the dawn of the nineteenth century, Britain was

already some thirty years into the Industrial Revolution. For the first time in history, economic growth comprehensively outstripped that of population to deliver improved prosperity to the average person. Figure 1 shows the dramatic rise in income per person that accompanied the harnessing of machines and the replacement of man and beast by coal-fired steam for motive power. Humankind had finally broken free of the Malthusian trap.

Figure 1: From poverty to prosperity—real income in England, 1200 to 2000



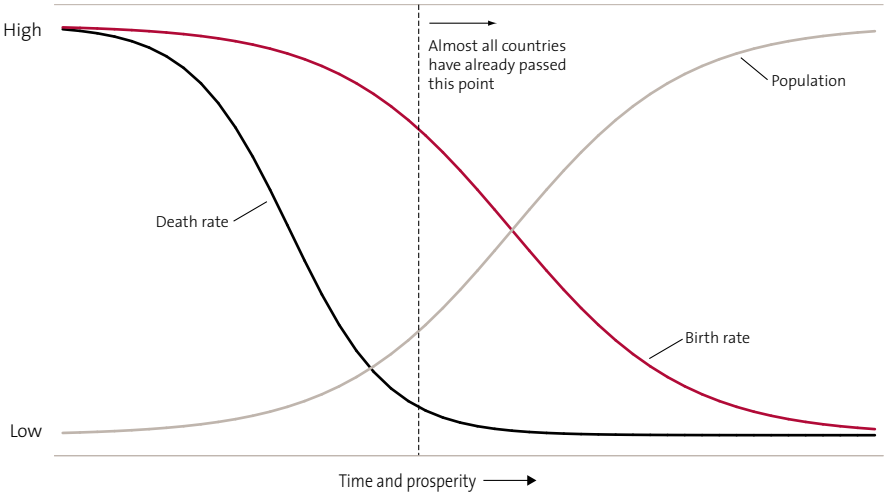
Source: Solow (2007)

Britain's industrialisation was but the first of many such transformations. By the start of the twentieth century, the US and much of Western Europe owed a large share of their national product to machines—either directly through manufacturing or indirectly through the increased productivity of agriculture. Today, a century later, many other countries have made the transition, including Japan, South Korea and Taiwan, while others like China and India are doing so now.

All such transitions share a common feature: increasing wealth leads to declining fertility. In this way, the Malthusian trap is broken not by increasing productivity alone, but through the interplay of individual prosperity and fertility. Each country's path to prosperity is unique, reflecting as it must the country's human and natural resources as well as the prevailing technical and commercial options available to it. Indeed, although England's industrialisation was faster than that of its European neighbours, its demographic transition was somewhat slower. But for our purposes what matters is the overall pattern of transition—an idealised depiction of which is set out in Figure 2.

The key steps in the idealised transformation are as follows. Growing prosperity delivers improved nutrition, sanitation and health care, allowing people to live longer. As expectations of longer life take hold, and especially as infant mortality declines, fertility rates drop and average family size falls. However, because reductions in the death rate (and particularly in infant mortality) precede reductions in the birth rate, the population increases in the meantime. It then takes an extended period for a new equilibrium to be reached, because the large number of people born in the early stages of the transition keeps the rate of births high for at least another generation, even if fertility rates fall quickly. Eventually, however, fertility and mortality rates stabilise and the population levels off.

Figure 2: Idealised demographic transition



Source: Adapted from RAND (2000) and PAI (2003)

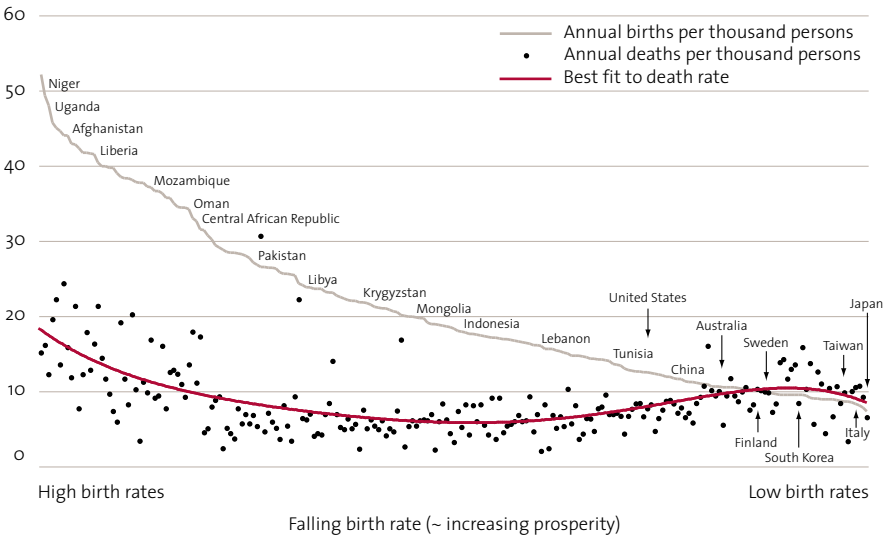
In practice, many factors—social, religious and political—influence the rates and extent to which fertility and mortality decline in response to economic development. China, for example, is close to stabilising its population already, despite relatively modest economic development. Even those countries furthest along the demographic transition are unlikely to have a stable population. Immigration and ongoing changes within societies influence the size and shape of populations beyond the idealised depiction in Figure 2.

In practice, many factors—social, religious and political—influence the rates and extent to which fertility and mortality decline in response to economic development.

Despite the many complications, if we pair death and birth rates for countries today and plot them in order of descending birth rate (i.e. ascending prosperity), the result is remarkably close to the second half of the idealised model. A selection of 224 countries has been labelled in Figure 3 to correlate the data with the real world. Aside from increasing our confidence in the model, this shows that the countries of the world are already a long way down the path of demographic transition—the Malthusian regime of high mortality and high fertility is but a distant memory.

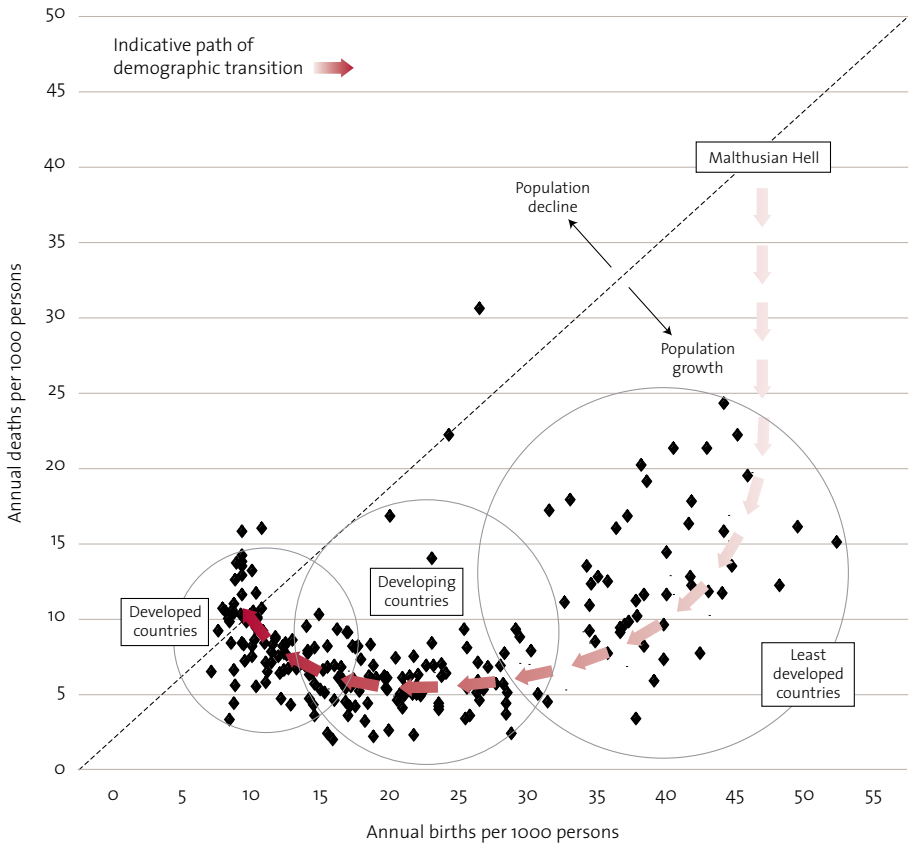
Another representation of humankind's progress can be produced by plotting countries against their birth and death rates, as in Figure 4. Once again, progress away from the Malthusian regime of high birth and death rates is clear. The indicative path of demographic transition is overlaid on the data. Several factors explain the outriding data, including increased death rates in countries afflicted by war and HIV/AIDS.

Figure 3: Birth and death rates (per 1000 persons) in order of descending birth rate



Source: ASPI analysis of data from US Census (2008)

Figure 4: Birth and death rates across 224 countries (2008)



Source: ASPI analysis of data from US Census (2008)

Overview of this report

The chapters that follow explore the security implications of humankind's ongoing journey from Malthusian poverty to a more prosperous (and populous) future. The United Nations classifies less than one-fifth of the global population as living in 'more developed' countries, so the global transformation that began near the end of the eighteenth century is far from complete. While this report's main focus is on demographics, questions about economic development are prominent and unavoidable, as economic development and demographic transition are interdependent parts of a single process.

The purpose is to examine the nexus between demographics and security.

The purpose is to examine the nexus between demographics and security. Many international reports have appeared in recent years, arguing that current demographic trends are inimical to peace and security. This report differs from much of the existing literature in two ways. First, it takes account of economic development rather than viewing demographics in isolation. Second, it adopts an unashamedly Australian perspective.

This report defines security as the absence of armed conflict or civil strife. Broader factors such as public health and natural disasters are examined only to the extent that they affect security more narrowly defined or they are so large as to be reasonably considered part of the 'national security' agenda.

Because human populations change on a timescale of decades rather than years, a long-term view is needed to explore the impact of demographics. To keep the discussion grounded, this report's focus is on the period to the middle of this century—although it speculates on the epoch beyond.

It goes without saying that the future is more than just the glacial evolution of populations and economies. History shows that single events, such as wars, crises and even technological innovations, can radically change the path of nations for the better or worse. It's beyond the scope of this report to chart the myriad possible contingencies and the impact they might have on the future. Instead, this report aims to explore the underlying demographic terrain upon which history will plot a course.

It's also worth stressing that demographics is rarely, if ever, a unique causal agent in security affairs. The stability of countries derives from a host of social, historical and institutional characteristics, of which demographics is but a limited part. Similarly, the geopolitics of the twenty-first century will evolve under the influence of many factors beyond demographics and economics. Nonetheless, as this report will show, demographics is an important ingredient in understanding how the world is changing and where security risks might arise.

Chapter 2 (Absolutes matter: the population bomb) surveys the Earth's capacity to provide adequate water, food and energy for its growing human population. Where these fundamental enablers of life and prosperity are scarce, the risk of conflict over resources can only increase—both within and between countries. But it's not just the balance between

population and resources that's relevant to security; some of the most important issues arise because of the wide variation in progress among countries and in the demographic factors within them. These issues are explored in Chapters 3 and 4.

Chapter 3 (The shifting balance) looks at how the economic component of demographic transitions is likely to change the relative power of countries and regions around the globe. It tells two intertwined stories. The first concerns rapid economic growth in developing countries like China and India, and the second is about populations ageing across almost all the developed world. Given the strategic relevance of the US and China to Australia, the chapter pays particular attention to their fates.

Chapter 4 (Pressures within: growing pains and the problem of youth) examines demographic trends within countries. It seems that no matter what stage of demographic transition a country finds itself in, there's always at least one demographic factor that can be argued—plausibly or otherwise—to be undermining security. The chapter explores such claims with a sceptical eye, using data to gauge the merit of the claims.

Chapter 5 examines two issues particular to Australia: the potential for immigration to usefully bolster our economic and strategic weight, and the vexed issue of rising populations and faltering development in our immediate region.

Finally, Chapter 6 suggests what Australia should do to prepare for the security challenges that demographic trends will bring in the decades ahead.

Data, sources and definitions

While the arithmetic of human birth and death is straightforward, the reproductive choices of individuals are hard to anticipate, as is the effectiveness of public health initiatives that are yet to begin. Equally, the speed of economic development that attends demographic transitions depends on many factors, including the character of international trade and finance. Recent experience with globalisation since 1990 and the financial crisis of 2008 shows just how quickly and unexpectedly things can change for better or worse.

Demographic projections are inevitably uncertain (and increasingly so, the further we peer into the future), but it would be wrong to conclude that they're too inaccurate to be useful. The built-in inertia of human populations gives us workable confidence in demographic projections extending out at least a couple of decades.

Moreover, the demographic developments of interest to this enquiry are already underway—they're established trends rather than possible new developments. And what really matters in most cases is the existence of a trend rather than specific statistics. A planet with 8.5 billion inhabitants rather than 9.5 billion is still a crowded place, and a country with a median age of 57 rather than 62 still has an aged population.

Unless otherwise specified, this report uses projections from the 2006 edition of the UN Population Database. The inherent uncertainties in the UN projections are captured by giving three variants: low, medium and high. Where the potential spread is relevant, this report quotes the range from the low to high variants; where it is not, it simply quotes the medium variant. For convenience, when referring to population statistics the report uses the UN classification of relative economic development as set out in Table 1. More generally, it refers to developed and developing countries in the usual sense.

Table 1: United Nations classification of relative development
More developed regions All regions of Europe, plus North America, Australia, New Zealand and Japan.
Less developed regions All regions of Africa, Asia (excluding Japan), Latin America and the Caribbean, plus Melanesia, Micronesia and Polynesia.
Least developed countries A subset of the less developed regions made up of the 50 least developed countries: Afghanistan, Bangladesh, Bhutan, Cambodia, Haiti, Kiribati, Laos, Maldives, Myanmar, Nepal, Samoa, Solomon Islands, East Timor, Tuvalu, Vanuatu and 35 countries in Africa.

Source: UNPD (2006)

Chapter 2

ABSOLUTES MATTER: THE POPULATION BOMB

Although no two countries follow the same course, escaping the Malthusian trap invariably results in a large one-off increase in population. Between 1801 and 2001, Britain's population grew sixfold from 7.8 million to 49.1 million, and between 1872 and 2006 Japan's population grew almost fourfold from 34.8 million to 127.8 million. Given the precedents of such large increases, the question arises as to whether the planet can sustain the transition to prosperity of all its inhabitants—and the attendant population growth.

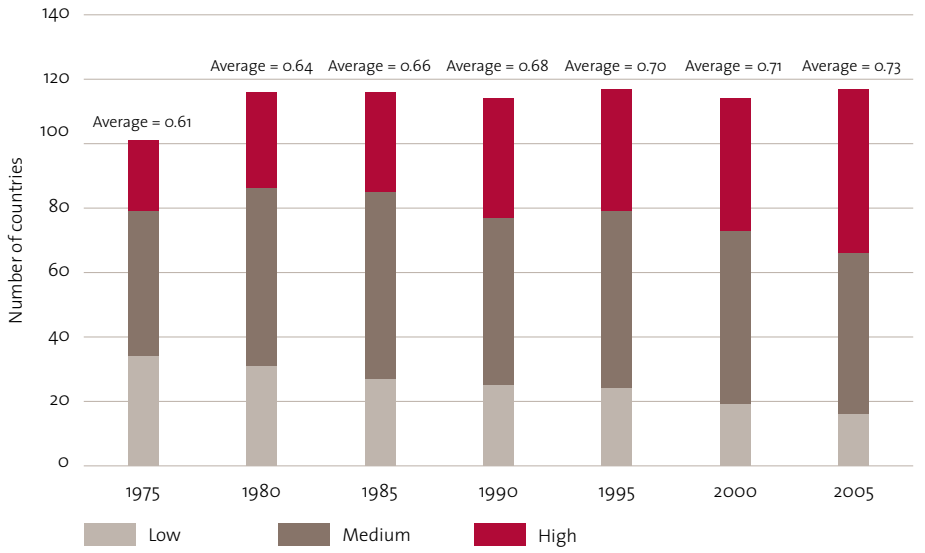
By the 1970s, the looming increase in population in the developing world was a matter of serious concern. Books like *The population bomb* (1968) by Paul Ehrlich and *The limits to growth* (1972) from the Club of Rome painted a grim picture of the human population outstripping the planet's capacity to feed and provide energy for its billions of inhabitants in the not-too-distant future. One of the more sober studies of the period was the (now declassified) 1974 National Security Study Memorandum prepared for the Ford Administration in the US. The *Kissinger Report*, as it is usually known, judged that due to potential increases in population in the less developed world 'there is a major risk of severe damage to world economic, political, and ecological systems and, as these systems begin to fail, to our humanitarian values.'

Progress in human development

Fortunately, in the intervening years, food production grew more quickly, and global population more slowly, than expected. As a result, in the three decades from 1975 to 2005, the lot of mankind improved despite the total population growing by 60% and that of less developed countries by 75%. We know this because the UN Development Programme calculates a Human Development Index (HDI), which measures a country's achievement in attaining for its citizens a long

and healthy life, access to knowledge and a decent standard of living. Depending on the HDI value that a country attains, the country is classified as having reached a low, medium or high level of human development. Figure 5 shows the average results for the three categories based on the 117 countries for which estimates are available back to at least 1980 (so as to exclude skewing by new entrants). The steady growth in countries classified as having a high level of human development is apparent, as is the reduction in the number of countries with a low level of development. A similarly positive picture emerges from the 20% increase to average HDI between 1975 and 2005.

Figure 5: UN Human Development Index, 1975 to 2005



Note: the number of countries fluctuates due to gaps in the data.
Source: UNDP (2008)

Data from the World Bank paints just as encouraging a picture. The proportion of people living in extreme poverty (less than US$1.25 per day) has fallen from 52% in 1981 to 26% in 2005.

Data from the World Bank paints just as encouraging a picture. The proportion of people living in extreme poverty (less than US$1.25 per day) has fallen from 52% in 1981 to 26% in 2005. In East Asia, the fall was even more dramatic, from 80% to 18% over the same period. Infant mortality rates in low- and middle-income countries have fallen from 8.7% of live births in 1981 to 5.4% in 2006, while life expectancy in those countries has grown from 60 to 66 years.

Despite this encouraging progress, the capacity of the planet to accommodate a still larger population shouldn't be taken as a given. Current projections are for the world's population

to grow from around 6.5 billion today to somewhere between 7.8 and 10.7 billion by mid-century (see Figure 6). Two questions must be answered:

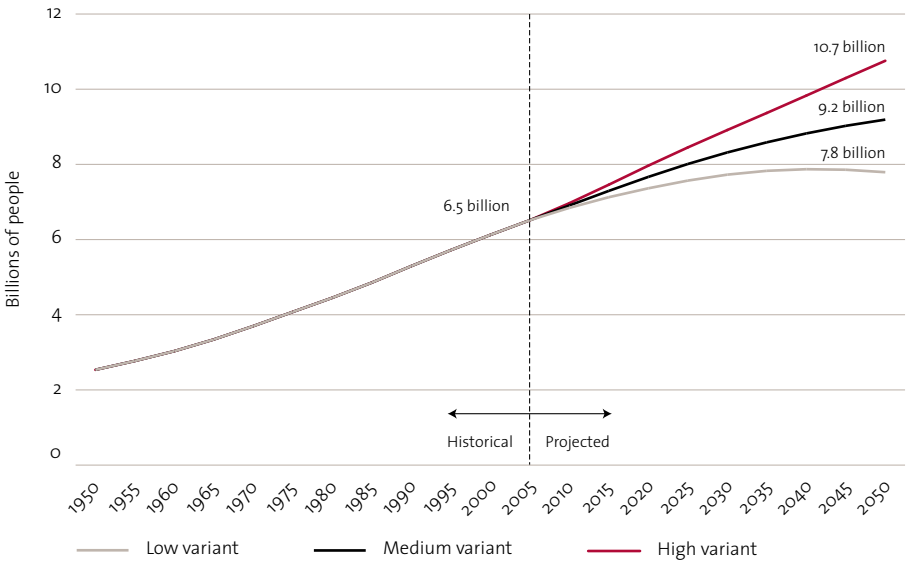
- Will there be enough food and water to provide the basics of life for that many people?
- Will the Earth's reserves of energy and other resources be adequate to sustain current patterns of economic activity and future development?

Before examining these questions, there are two important points to make:

First, whatever the level of global population growth, it's certain to be concentrated in those countries least able to support the increase. According to the UN medium variant projection, the population of the more developed world will grow by only 2.4% between now and 2050, while that of the less developed world (excluding the least developed countries) will grow by 37%, and the population of the vulnerable least developed countries by 127%. Although this isn't surprising, given the dynamics of demographic transition, it doesn't bode well for the future, as many poor countries are already under stress.

Second, the most important driver of increased resource consumption will be the rise in standards of living rather than raw population growth. This is especially the case when it comes to energy. Over the past thirty years, energy consumption has grown by 80% while population has only grown by 55%; over the next twenty years, energy consumption is projected to grow by 35% compared to population growth of only 20%.

Figure 6: Historical and projected global population



Source: UNPD (2006)

Food and water

The world produces more than enough food to satisfy the nutritional needs of everyone on Earth today. In fact, as Table 2 shows, current production of grains, oils and sugar is enough to feed a human population of close to 12.5 billion, based on the UN benchmark of 2,100 calories per person per day.

Yet hunger is widespread in the world today. The UN World Food Programme estimates that 854 million people currently have a food intake inadequate to meet their energy needs.

Table 2: World basic food production, 2007–08

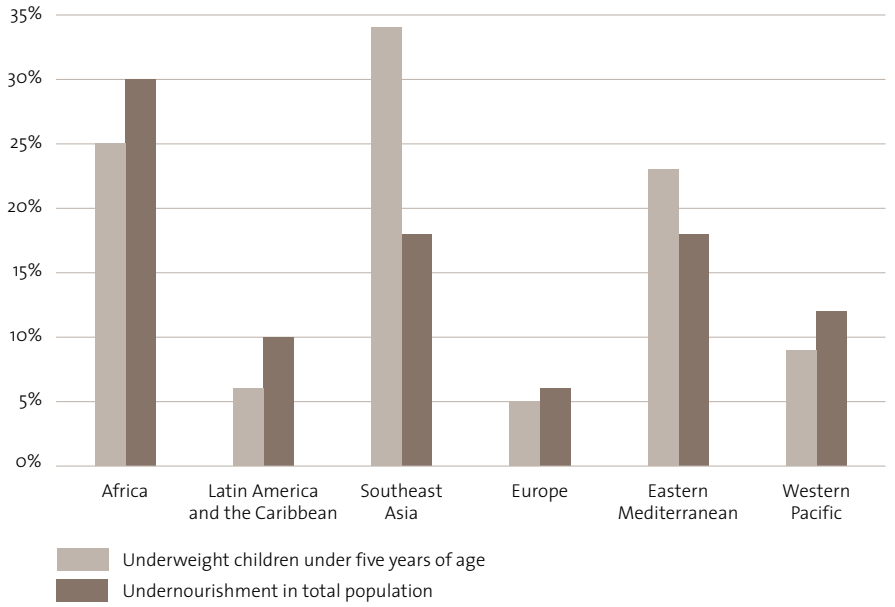
	Production (billion tonnes)	Calories per tonne (billions)	Calories produced (quadrillions)	People able to be fed (billions)
Wheat	610.2	3.39	2.07	2.70
Rice	431.3	3.66	1.58	2.06
Oilseed	391.5	3.71	1.45	1.90
Raw sugar	166.6	4.00	0.66	0.87
Coarse grains	1,077.6	3.50	3.77	4.92
Total			**9.54**	**12.45**

Source: ASPI calculations based on data from USDA (2008). A quadrillion is 10^{15}.

Figure 7 shows the extent and distribution of hunger among 103 developing and transitional countries in 2007. The human consequences of widespread hunger are grim, to say the least. In 2005, the World Health Organization (WHO) estimated that 32% of all children under the age of five, some 178 million kids in all, were stunted in growth. More serious still, the World Food Programme estimates that more than half of the 10 million children under the age of five who die in a given year die from causes related to undernutrition.

Of course, hunger is but one aspect of the broader problem of poverty. According to the WHO, around 1.1 billion people lack access to safe drinking water and 2.6 billion are yet to enjoy proper sanitation. The paradox of massive poverty amidst global plenty has an easy explanation: the rich don't share with the poor. For example, a large proportion of global agricultural production is fed to livestock to generate meat, milk and eggs for those who can afford them, rather than being used to feed the hungry. To make matters worse, an increasing share of global crops is being diverted to produce ethanol and biodiesel as replacements for petroleum-based fuels. In these ways, hunger and poverty result from the allocation, rather than the availability, of resources.

Figure 7: Hunger indicators in developing and transitional economies



Source: UNWFP (2007)

So what does the future hold? To begin with, it's highly improbable that poverty will be alleviated by the rich sacrificing to benefit the poor. Official development assistance from OECD countries amounted to a paltry 0.31% of aggregated gross national income in 2006. Like it or not, humanitarian values run a poor second to the indulgences of affluence. If the projected growth in human population is to be accommodated, it will be because, as in the past, economic development grows to meet the need.

Over the past fifty years, that's exactly what's happened. Despite a 186% increase in the population of the less developed world over the period, substantial progress has been made in improving conditions in those countries. For example, the Food and Agriculture Organization (FAO) of the UN estimates that the proportion of people in developing countries consuming less than the recommended level of calories fell from 57% in the mid-1960s to 10% in the late 1990s. With the population of the less developed world projected to increase by a more modest 61% between 2000 and 2050, the current task looks tractable.

An FAO report in 2002 examined the prospects for feeding the world's population out to 2030. On the whole, the report was cautiously optimistic. To start with, the scale of the problem is manageable by historical standards. While the demand for agricultural products in developing countries grew by an average of 3.7% per year over the past thirty years, the average annual growth out to 2030 is expected to be only 2%. In addition, the global supply of unused farmland is more than adequate to the task (only around a third of potentially arable land is currently under cultivation). Where problems arise is in the distribution of exploitable agricultural resources.

Even though the broad outlook is for steady overall improvement, substantial hunger and poverty will persist in some regions.

While more than ample additional resources are available in Latin America and sub-Saharan Africa, many regions face shortages. In particular, around 87% of suitable land in the Near East and North Africa is already being farmed, along with 94% of suitable land in South Asia. However, provided that economic growth is maintained, this should be manageable on the whole. Not only can crop yields be improved but, as already happens, food can be imported from countries with a surplus. The FAO report estimated that the proportion of the people living in developing countries suffering from undernourishment would fall to 6% by 2030, compared with 17% in 2002. In absolute terms, the number of undernourished people in 2030 is projected to fall to 440 million, compared with almost twice that number today.

Even though the broad outlook is for steady overall improvement, substantial hunger and poverty will persist in some regions. As is already the case, countries will miss out either through poor policies and governance or paucity of natural resources. The availability of cropland and water is likely to be one of the more important limitations for some countries. According to the 2008 US National Intelligence Council Report *Global trends 2025*, by 2025 there will be thirty-six countries experiencing a scarcity of cropland or freshwater compared with twenty-one today.

How well economic development meets the demands of growing populations in the decades ahead will depend on how quickly global trade spreads and on the pace of reform within developing countries. One of the potential limiting factors to the spread of prosperity is the availability of energy to sustain current and projected levels of economic activity.

Energy

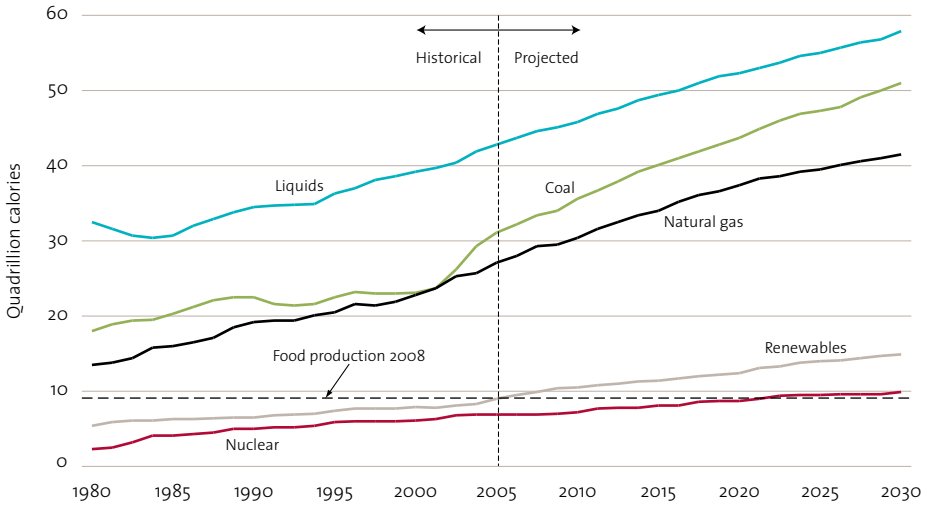
Under current economic patterns, the prosperity of the developed world, and the long-term prospects of the developing world, depend on the continuing availability of energy and minerals. Of these, energy is generally recognised as the more critical and least assured. The US Energy Information Administration (EIA) forecast in 2008 that over the period from 2005 to 2030 global energy consumption will rise by 50%, made up of a 19% increase in OECD countries (essentially, the developed world) and an 85% increase in non-OECD countries.

Depending on the relative price of fuels, current consumption patterns are likely to shift as more expensive alternatives progressively become competitive. The EIA baseline medium-growth projection (which assumes that no effective policy action is taken to stem CO_2 emissions) is shown in Figure 8. For convenience, the energy content of the various fuels has been expressed in calories. To demonstrate the futility of biofuels as a substitute source for anything more than a slight fraction of current demand, the energy content of current crop output has been marked on the figure.

The EIA forecast explicitly takes into account estimated energy reserves. However, as Table 3 shows, the EIA modelling ends before proven reserves of the three main sources of energy—oil, gas and coal—begin to be exhausted.

The picture gets worse if we take into account the rise in consumption predicted by the EIA. By 2030, current proven reserves of oil will have been depleted by 70%, gas by 50% and coal by 17%. More serious still, extrapolating the growth in consumption past 2030 and assuming successive substitution of fuels, one finds that oil runs out in 2037, oil and gas in 2043, and oil, gas and coal in 2064.

Figure 8: Historical and projected world energy use, 1980 to 2030



Source: EIA (2008)

Table 3: Proven energy reserves, 2008

Resource	Proven reserves	Current annual usage	Years left at *current* consumption rate
Oil	1.2 trillion barrels	31 billion barrels	39
Gas	6,250 trillion cubic feet	104 trillion cubic feet	60
Coal	930 billion tons	7 billion tons	133
Uranium	3.4 million tons	67,000 tons	51

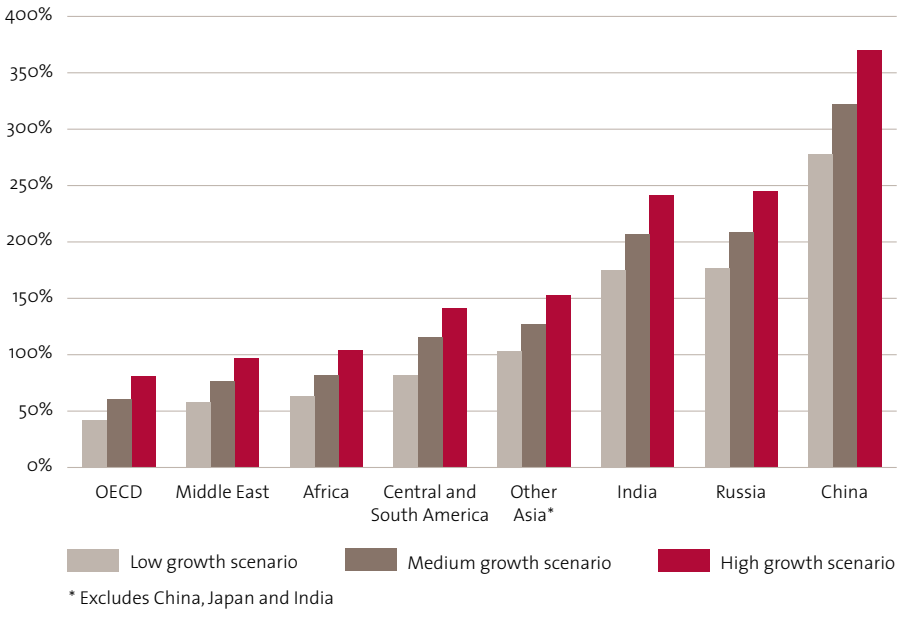
Sources: EIA (2008), Maeda (2005)

But the situation isn't as bad as it seems. Proven reserves are a conservative lower bound on available resources. Most analysts think that a lot more fossil fuels exist, both as unproved reserves and in new sources like oil shales and coal tars that aren't economically viable at present. For example, the EIA judges that another 0.9 trillion barrels of oil will be found—representing a 75% boost on proven reserves.

Because of the uncertainties about unproven reserves and new sources of fossil fuels, it's impossible to be precise about how long current energy consumption can be maintained. However, it appears likely that current sources will last at least a decade or two beyond the middle of this century. Thus, for at least the next half-century, the availability of energy will not stop economic development from mitigating the impact of a larger global population.

In fact, just as in the recent past, economic growth will probably be sufficient to continue to raise—not just maintain—living standards in the developing world. As part of projecting trends in energy demand to 2030, the EIA estimated the rate of economic development for geographical regions in three scenarios: low, medium and high economic growth. Figure 9 shows the EIA estimates for growth in per capita gross domestic product (GDP) by region for the period from 2005 to 2030. Even in the pessimistic low-growth scenario, prosperity improves in all regions.

Figure 9: Estimated changes in per capita GDP, by region, 2005 to 2030



Source: EIA (2008)

On the basis of these estimates, we can expect to see a slow but steady reduction in poverty, consistent with the FAO's projections of improved nutritional outcomes in the decades ahead. In any possible future, there will be some countries that do well and others that do less so. Not everyone will enjoy the sort of growth that China has achieved. Some countries—including a number in sub-Saharan Africa—will continue to be caught in a vicious circle of instability and extreme poverty. But make no mistake: the overall trajectory is positive, as long as the energy lasts. The box below examines the long-term question of what happens when it runs out.

The world beyond 2050—What comes next?

Whether or not the next fifty years looks like the last fifty, the half-century that follows it will be very different. Even taking into account unproven reserves and exotic fossil fuel sources, it's difficult to see how the current regime of economic activity—dependent as it is on massive energy use—can be sustained past the end of the twenty-first century. The hard reality is that the ready availability of cheap energy will decline through the second half of this century, forcing a progressive re-engineering of global economic activity.

To put the challenge in perspective, the prosperity of the developed world is built on per capita rates of energy consumption several tens of times higher than in the pre-industrial era. It's important to realise that energy is unique among the factors of production because it allows machines to do physical work. The less energy used, the less physical work done.

Eventually there will emerge a new pattern of economic activity that can be sustained by the (as yet unknown) level of energy that can be produced by other means. With the new pattern will come a new level of prosperity for mankind—whether it is judged to be higher or lower than at present is a moot point, but it will be different. Along the way, the comparative economic advantages of countries will shift profoundly from what they are now. The change that occurs will be every bit as profound as the Industrial Revolution that heralded the present epoch. It's unlikely that large populations will be an asset.

None of this bodes well. As energy becomes more expensive (as it must with scarcity), it will be harder for less developed countries to make progress. Under current patterns of economic activity, their transition from poverty to prosperity is no less dependent on readily available energy than was the transition of the now developed world during the nineteenth and twentieth centuries. Nations that fail to attain a basic level of development before the era of cheap energy draws to a close will be at a disadvantage. It is particularly worrying that current food production and distribution are highly dependent on cheap energy. Even in the developed world, the adaptations necessary will be significant and will come at the same time as climate change begins to be felt in earnest.

In the late eighteenth century, before fossil fuels began to power economic growth, the world's population was about one-tenth what it will be in the second half of this century. Malthus may yet make a return.

Climate change

No examination of the planet's capacity to support a growing human population would be complete without considering the impact of climate change. The latest report from the Intergovernmental Panel on Climate Change predicts a range of adverse impacts if CO_2 emissions are not drastically curtailed, including:

- increasing water stress and food shortages in Africa from 2020 onwards
- decreased availability of fresh water in parts of Asia from 2050 onwards
- progressively more frequent and severe flooding in Asian river deltas
- increased drought and reduced agricultural production in Australia from 2020
- growing risk of inundation, and freshwater shortages from 2050, in small Pacific island nations.

Because there is no international agreement to cut CO_2 emissions by the amounts estimated as necessary to avert climate change, the prudent assumption must be that climate change will occur to the extent that these predictions are accurate. However, the projected impact of climate change is not a major factor over the forty-year period covered in this report.

... while we can't discount the possibility that climate change will have an adverse impact in some geographical areas in the next forty years, systemic and economically significant impacts appear to be a more distant prospect.

The 2006 Stern Report, for example, paints a far from alarming picture. In 2050 the economic impact is effectively zero, and even by 2100 the extreme worst case scenario only yields a 7.5% drop in per capita GDP—the reference case estimate is a fall of only 1%. The more recent 2008 Garnaut Report is more pessimistic, predicting a 2% reduction in gross national product by 2050 and 7.5% by 2100 for Australia (Garnaut doesn't give estimates for the world economy). In comparison, per capita GDP in Africa and India is expected to grow by around 60% to 100% over the next 25 years (see Figure 9). Thus, over the next half-century, climate change will result in only a marginal reduction in otherwise strongly growing prosperity.

Of course, focusing on the aggregate impact doesn't tell the whole story: climate change will probably hit poorer countries more severely than the global average. But even then the picture is far from dire. Stern provides estimates of the additional number of people living on less than $2 a day in South Asia and sub-Saharan Africa as a result of climate change. By 2050, the figures are 2 million and 6 million respectively, and by 2010, 18 million and 30 million. In each case, these will make up only a tiny fraction of the more than 1.5 billion people who will be living in each region, and a far smaller number than the population that will be added to those countries in the same timeframe.

Thus, while we can't discount the possibility that climate change will have an adverse impact in some geographical areas in the next forty years, systemic and economically significant impacts appear to be a more distant prospect. This report's earlier conclusion remains unchanged: to mid-century, economic development will continue to raise living standards around the globe despite population growth.

Implications for security—the vulnerable and the volatile

Broadly speaking, the future looks good. To the extent that poverty predisposes countries to civil strife, rising prosperity will bring rising stability. If only rising prosperity were going to be universal.

As is the case today, many countries will continue to live in poverty and some may even move backwards. There are many reasons for this: some countries simply lack natural resources; others will fail to create the institutions needed for development; some will be bled dry by their own corrupt and incompetent governments; and some will remain locked in a vicious cycle of insecurity and faltering progress.

For security, it's the exceptions rather than the trends that matter. And there will be many countries in areas like sub-Saharan Africa, Central Asia and parts of the Middle East that will struggle for decades hence for the reasons outlined above. Chapter 4 of this report explores how poverty and related demographic factors will affect the likelihood of intra-state conflict in these and other fragile places.

Implications for security—resource security

In the arithmetic of a world with finite resources, growing populations plus expanding economies equals increasing scarcity. So, will the future see competition for resources among states spill over into conflict?

It's beyond the scope of this study to explore the complexities of resource competition. The involvement of major powers in the affairs of energy-producing countries, for example, is several steps removed from demographic factors.

Global prosperity rests on a pattern of international behaviour that strongly favours negotiation over military power to settle questions of ownership.

It suffices to say that the likelihood of resource competition causing direct conflict between states appears to be on a downward trend. Global prosperity rests on a pattern of international behaviour that strongly favours negotiation over military power to settle questions of ownership. The outright theft of territory for the purpose of economic gain rarely occurs and even more rarely succeeds. The few recent precedents all ended badly for the aggressor. The Japanese expansion preceding and during World War II and the Iraqi seizure of Kuwait in 1990 are two examples—in each case the aggressor suffered economic isolation and eventual defeat for its actions. It would rarely make sense for a country to steal resources from another at such a cost.

Of course, territorial disputes can and have spilled over into violence, but that has more often been a case of borders being used as a *casus belli* when chauvinism and nationalism are actually driving events. Economic interests are rarely well served by military means.

Swapping old problems for new

It would be nice to conclude that the global trend to greater prosperity will herald an epoch of greater peace for the world, but that conclusion is unjustified. Even setting aside those parts of the world where economic development is likely to falter (which this report explores later), no foreign policy theorem says that prosperity and conflict are incompatible.

As countries become richer and more stable, they may turn their attention outwards to prosecute historical grievances, or may indulge their intolerance of minorities in their midst. We shouldn't assume that countries moving towards the end of their demographic transition will behave any better than some developed nations did in the twentieth century; nor should we assume that the newly emergent major powers will be welcomed wholeheartedly by the incumbents.

Chapter 3

THE SHIFTING BALANCE

Prosperity and power

The eclipse of established powers by emerging competitors is a recurring theme in history. Apart from the aberration of the Soviet Union, the pre-eminent powers of the past two centuries have been large western countries (and Japan) that successfully embraced industrialisation and free-market economics. But nothing lasts forever: the current epoch of globalisation is accelerating economic development around the globe and eroding the relative advantage of the traditional powers in the process. The era of the West is drawing to a close.

The sheer scale of population in those parts of the less developed world being propelled forward by globalisation is a critical factor.

The sheer scale of population in those parts of the less developed world being propelled forward by globalisation is a critical factor. Take China, for example: despite the impressive progress it has made in recent years, it still has hundreds of millions of people employed in low-productivity jobs. China's average per capita output (GDP) at market exchange rates in 2008 was around US$3,200, compared with the US at US$47,000. This reflects China's early stage of development and confirms that it will continue to benefit from the advantage of cheap labour for a long time to come.

Moreover, while the US had to import labour to fuel its economic growth in the nineteenth and twentieth centuries, China has a resident pool of tired and hungry (and reasonably well educated) people on hand.

And, as huddled masses go, the pool is enormous. Since 1820, the US has admitted around 73 million migrants; the current population of rural China is 744 million.

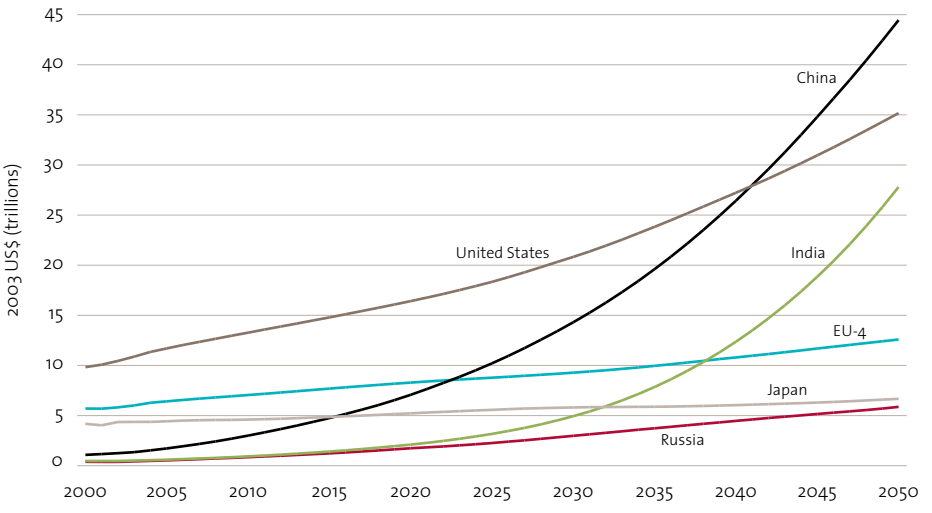
For China to reach the same level of individual prosperity as the US today, its per capita GDP would have to grow by a factor of 15. Historically, it took Japan fifty years (1945–1995) to achieve a 15-fold increase. But because of China's massive population, the growth in per capita GDP needed to match the US in absolute (national) GDP is only a factor of 4.

A fourfold increase in per capita GDP can occur quickly. Australia's real per capita GDP grew fourfold between 1820 and 1847 (27 years). Japan, which is a closer analogue to China, achieved a fourfold increase between 1945 and 1964 (19 years) and again between 1964 and 2006 (42 years). In fact, Japan's postwar boom saw real per capita GDP grow 17-fold in the period between 1945 and 2006. Aside from proving that China's economic development is not unprecedented (contrary to the opening sentence of almost everything ever written on the topic), these examples show that it's entirely possible for the Chinese economy to draw close to that of the US by mid-century.

Of course, the actual rates at which China and other developing nations grow relative to the industrialised world will depend on a number of factors that the foregoing analysis ignores. A more detailed analysis by investment bank Goldman Sachs in 2003 projected key international GDP growth rates, taking into account growth in employment, productivity and capital stock, and including the impact of expected exchange rate adjustments. Demographic factors were taken into account through employment growth. The analysts' projections of GDP and per capita GDP for countries of interest to Australia are set out in Figures 10 and 11. The EU-4 grouping represents the combined economies of the four largest European powers today: Italy, France, Germany and the UK.

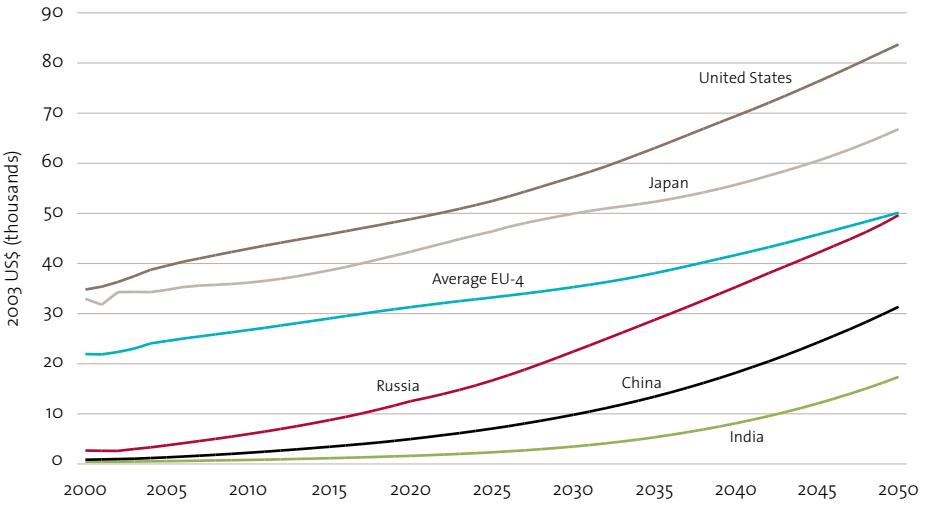
The Goldman Sachs projections are broadly consistent with similar estimates done elsewhere, including the latest from the EIA (which extend to 2030). Even so, it would be foolish to take the precise figures as concrete predictions. There are unavoidable uncertainties in this sort of modelling, such as the impact of recessions and shifts in trade patterns. For the purposes of this report, it's the broad trends that matter, and these projections are as good a bet as any we have.

Figure 10: Projected real GDP, 2000 to 2050



Source: Data taken from Goldman Sachs (2003)

Figure 11: Projected real GDP per capita, 2000 to 2050



Source: Data taken from Goldman Sachs (2003)

Several things stand out. First of all, India and China are projected to grow into economic superpowers as their massive underutilised labour capacity is put to more productive use. Note that the projections have China passing the US in real GDP in 2042, consistent with this report's earlier speculation. By the same mechanism, although on a smaller scale, the Goldman Sachs modelling projects that Russia will grow to be the world's sixth largest economy by mid-century, overtaking the individual economies of Italy, France, Germany and the UK along the way.

... India and China are projected to grow into economic superpowers as their massive underutilised labour capacity is put to more productive use.

Although the projected scale of economic growth in the developing world is massive, it will be insufficient to raise individual prosperity (GDP per capita) to that in the West. The populations of India and China, not the depth of their development, give those countries their advantage.

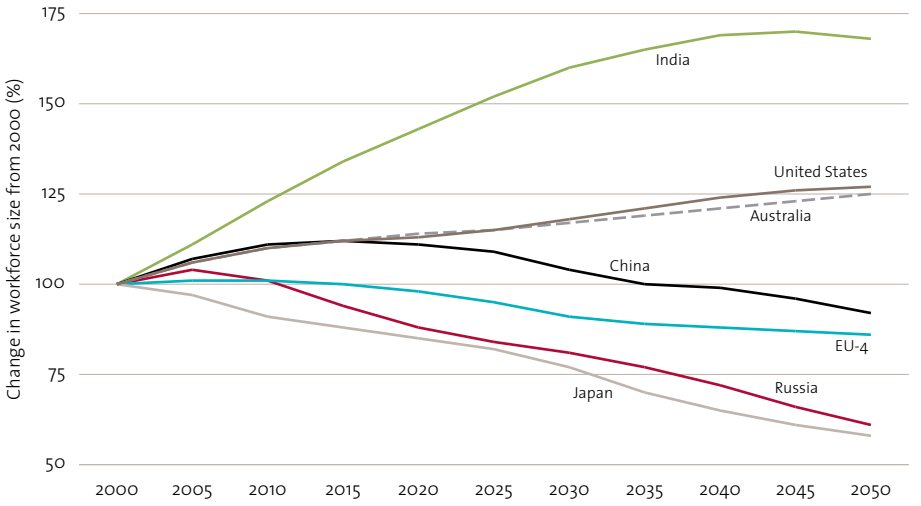
In stark contrast to the rapid economic growth of the emerging economies, the current European powerhouses of France, Germany, Italy and the UK are projected to achieve only relatively modest growth, and Japan even less. The relatively poor performance of Western Europe and Japan reflects two factors:

First, developed economies have far less opportunity to achieve productivity growth than developing countries. While developing economies can, for example, redeploy low-productivity agricultural workers into much higher productivity manufacturing jobs, developed economies have to rely on the marginal gains to be had from more efficient manufacturing or compete in the limited market for higher value-added services. As a result,

developed economies are further along the curve of diminishing returns from innovation and investment than their less developed counterparts.

Second, Western Europe and Japan are at the final stage of demographic transition. Not only are their populations likely to remain around the size they are today (thereby closing off an avenue for economic growth), but the number of working-age people is set to decline as ageing pushes the postwar boom generation and their children into retirement. Figure 12 shows the relative changes to the working-age populations in key countries.

Figure 12: Relative changes in workforce size, 2000 to 2050



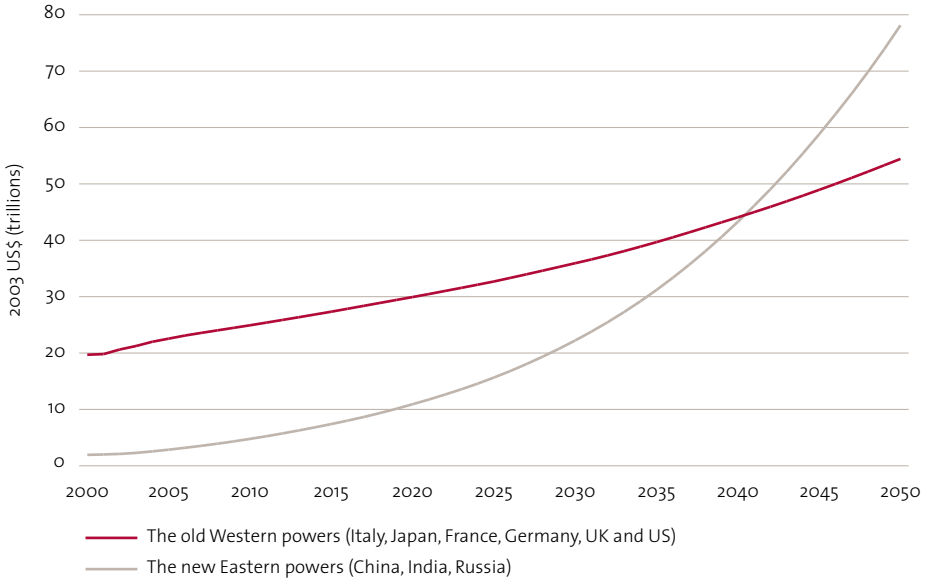
Note: Workforce is population aged 15 to 59 years.
Source: Data taken from UNPD (2006)

Although the US economy is not projected to grow anywhere near as rapidly as China's, India's or Russia's, it fares somewhat better than the economies of Europe and Japan. This reflects the US's marginally higher fertility rate and more open approach to immigration—two advantages that Australia shares. The impact of China's one-child policy makes itself felt from 2015 onwards but, like Russia, China will maintain its economic growth by shifting people into higher productivity jobs. Chapter 4 of this report further explores the impact of ageing.

The net result of projected developments is that economic power will move from the old to the new, from the West to the East, and from the rich to the poor.

The net result of projected developments is that economic power will move from the old to the new, from the West to the East, and from the rich to the poor. Figure 13 plots the relative outputs of the current G6 (Italy, France, Germany, Japan, UK and US) and the emerging economies of China, India and Russia.

Figure 13: Projected real GDP—the rise of the East



Source: Data taken from Goldman Sachs (2003)

So what?

As interesting as economic prophecy is, the reader is probably wondering what, if anything, this all has to do with security. The sceptical reader might even observe that growing prosperity in developing countries will give them a greater vested interest in maintaining the global system, thereby making conflict less likely. Such arguments have been made before (including during the first era of globalisation that ended with the catastrophe of World War I) and have been proven wrong.

We're yet to see how Japan, the US and an increasingly powerful China might accommodate each other in North Asia.

The rise of new powers has rarely been accomplished peacefully in the past. We're yet to see how Japan, the US and an increasingly powerful China might accommodate each other in North Asia. Given the deep historical enmity between Japan and China, and the reticence of the US to cede either its leadership or military advantage, it's easy to be pessimistic. Similarly, it remains to be seen how Western Europe will manage the rise of Russia as an energy giant. The recent crises involving Georgia and Ukraine are perhaps a foretaste of how Russia might use its position.

And even if conflict can be avoided, the shift in power will create challenges. For the past fifty years, western nations have effectively run the international financial system and exerted a decisive influence on security affairs. With our allies and rich friends in charge, times have been good for Australia. In the future, however, the rich world of which we are a part will increasingly have to negotiate with powerful states representing the interests and aspirations of vast numbers of relatively poorer people.

What about the global financial crisis?

In the short term—for at least a year or two—economic growth will be set back around the globe. What happens next is harder to predict. Developed and developing countries are working in concert to get back to the regime of international trade and finance that prevailed before the crisis. This is understandable: the financial crisis was a banking failure and not a breakdown in the broader pattern of trade that underlies global prosperity (although that has now been disrupted). While countries disagree on many things, no-one has suggested an alternative to globalisation to drive prosperity. There's no competing model.

A return to something like the old pattern of trade and finance would restart the process of the developing world catching up with the developed. This remains the most likely option.

However, we can't completely discount the possibility that protectionism might re-emerge from the ashes of the crisis. If it does, the future regime of trade and finance between the developed and developing world will be somewhat different from what it was in the past. The extent to which this would limit economic growth in countries like China and India is hard to say. In the near term, it would have an adverse impact (as it would in the developed world, where the cost of manufactured items would rise—thereby eroding living standards).

Yet the fundamental fact would remain: developing countries like China can achieve much higher rates of growth because they start from a lower productivity base. And if the developed world decides not to buy what they produce, countries like China have the option of generating domestic demand. It wouldn't be easy, but at least they have the capital to work with. If only the same were true in the heavily indebt developed world.

Chapter 4

PRESSURES WITHIN: GROWING PAINS AND THE PROBLEM OF YOUTH

In addition to profoundly shifting the balance between nations, demographic developments will reshape countries old and new from within. This chapter explores how the changing demographics of countries might affect their security and stability. The scope here is global; specific issues to do with Australia and its immediate region are dealt with in the next chapter.

The survey is unavoidably disjointed because of the wide range of factors in play, but begins with a look at the challenges in high-fertility countries that are yet to complete their demographic transition (the problems of youth), followed by an exploration of the challenges faced by low-fertility countries (the problems of old age). A series of specific topics follows in no particular order: migration; identity and diaspora; gender imbalances; and natural disasters.

As a general rule, countries in the intermediate stages of demographic transition experience internal conflict more often than those that have completed the transition. To some extent, this reflects the rocky path of political evolution that tends to accompany economic development. Decolonisation left many countries with fragile and often inappropriate political institutions, and the process of building workable alternatives is not always peaceful. Three demographic factors that accompany the intermediate stages of demographic transition—high youth populations, urbanisation, and scarcity due to rising populations—correlate strongly with civil conflict and, to different extents, might be destabilising factors in themselves.

Table 4 lists a selection of key demographic statistics for countries and regions; that information is useful in the discussion in this chapter.

Table 4: Key demographic data 2000 to 2050

	Population growth 2000 to 2050	Median age 2000	Median age 2050	Aged dependency 2000	Aged dependency 2050	Youth proportion 2000	Youth proportion 2050	Infant mortality 2000–05	Infant mortality 2045–50	Urbanisation rate 2025–30
Global										
World	50%	27	38	11%	25%	37%	25%	54	23	1.6%
More developed regions	4%	37	46	21%	45%	26%	19%	8	4	0.4%
Less developed regions	61%	24	37	8%	23%	40%	26%	59	26	1.9%
50 least developed countries	158%	19	28	6%	11%	48%	36%	95	41	3.5%
Major and emerging powers										
United States	41%	35	41	19%	34%	26%	22%	7	4	0.9%
Japan	–19%	41	55	25%	74%	24%	14%	3	3	0
China	11%	30	45	10%	39%	33%	19%	26	10	1.4%
India	58%	23	39	8%	21%	42%	24%	63	23	2.6%
Russian Federation	–27%	37	45	18%	39%	28%	18%	17	9	–0.3%
Geographic regions										
Western Europe	2%	39	47	24%	48%	22%	19%	5	3	0.4%
Eastern Europe	–27%	36	48	19%	45%	28%	17%	14	3	–0.2%
Southern Europe	0%	38	49	24%	57%	25%	16%	7	4	0.4%
Northern Europe	15%	38	44	24%	41%	24%	20%	5	3	0.5%
North Africa	78%	21	36	7%	21%	45%	26%	45	15	1.9%
Sub-Saharan Africa	159%	18	27	6%	9%	49%	38%	100	44	3.1%
Eastern Asia	8%	31	46	11%	41%	32%	19%	24	10	1.2%
South-central Asia	283%	22	37	7%	20%	43%	25%	65	25	2.5%
South-eastern Asia	47%	24	40	8%	27%	42%	23%	33	10	1.7%
Western Asia (~Middle East)	93%	23	36	7%	20%	44%	27%	46	11	1.7%
North America	41%	35	42	19%	35%	26%	22%	7	4	0.9%
Central America	49%	23	41	8%	29%	45%	23%	24	7	1.2%
Caribbean	30%	27	40	12%	30%	36%	24%	33	11	1.0%
South America	48%	25	40	9%	29%	40%	23%	25	8	0.9%
Melanesia	98%	20	32	4%	12%	47%	32%	60	26	3.2%
Polynesia	39%	22	37	8%	22%	41%	26%	19	8	1.8%
Micronesia	63%	24	36	6%	21%	40%	27%	29	9	1.4%
Countries of interest										
Australia	47%	35	43	19%	41%	27%	21%	5	3	0.9%
Indonesia	40%	25	41	8%	29%	42%	22%	34	9	1.5%
Papua New Guinea	111%	19	31	4%	11%	47%	33%	65	28	4.1%
Solomon Islands	130%	19	32	5%	13%	51%	31%	60	20	3.9%
Fiji	13%	23	38	6%	21%	42%	26%	22	9	1.3%
East Timor	323%	15	25	5%	8%	44%	40%	79	16	4.4%
Afghanistan	283%	16	23	4%	5%	50%	44%	168	76	4.6%
Pakistan	126%	19	33	7%	15%	49%	33%	71	27	3.1%
Iraq	147%	18	31	5%	13%	49%	32%	94	14	2.3%

Infant mortality: deaths per 1,000 births prior to age 1 year.
Youth proportion: ratio of people aged 15 to 29 to those aged 15 to 64.
Aged dependency: ratio of people aged over 64 to those aged 15 and older.

Source: UNPD (2006)

Three demographic factors that accompany the intermediate stages of demographic transition—high youth populations, urbanisation, and scarcity due to rising populations—correlate strongly with civil conflict and, to different extents, might be destabilising factors in themselves.

Youth bulges

An almost inevitable consequence of demographic transition is a build-up of young people in the period after mortality rates fall and before fertility rates do likewise. It's often claimed that the resulting 'youth bulge' increases the risk of internal conflict—especially when economic development fails to provide adequate jobs.

This is plausible. Youth bulge generations are born into societies in which the population is growing rapidly and traditional socioeconomic structures are eroding. It's conceivable that the potential for unrest is heightened by having a high proportion of young people who are, by nature, inherently less risk averse.

Whether we accept that youth bulges are a causal factor or simply a reflection of a more complex sociopolitical dynamic accompanying economic development, the correlation between civil conflict and youth bulges is clear. Table 5 shows the results of a study of 145 countries for the period from 1990 to 2000. The likelihood of civil conflict was calculated as the proportion of countries that experienced an outbreak of civil war in the decade (excluding recurrent and persistent conflicts from the prior decade). The proportion of young adults is the share of the adult population (defined as 15 years and older) aged between 15 and 29 years. As statistical correlations go, the result is clear: the likelihood of conflict was three times higher in countries with youth proportions of 40% or more than it was in countries with a proportion less than 30%.

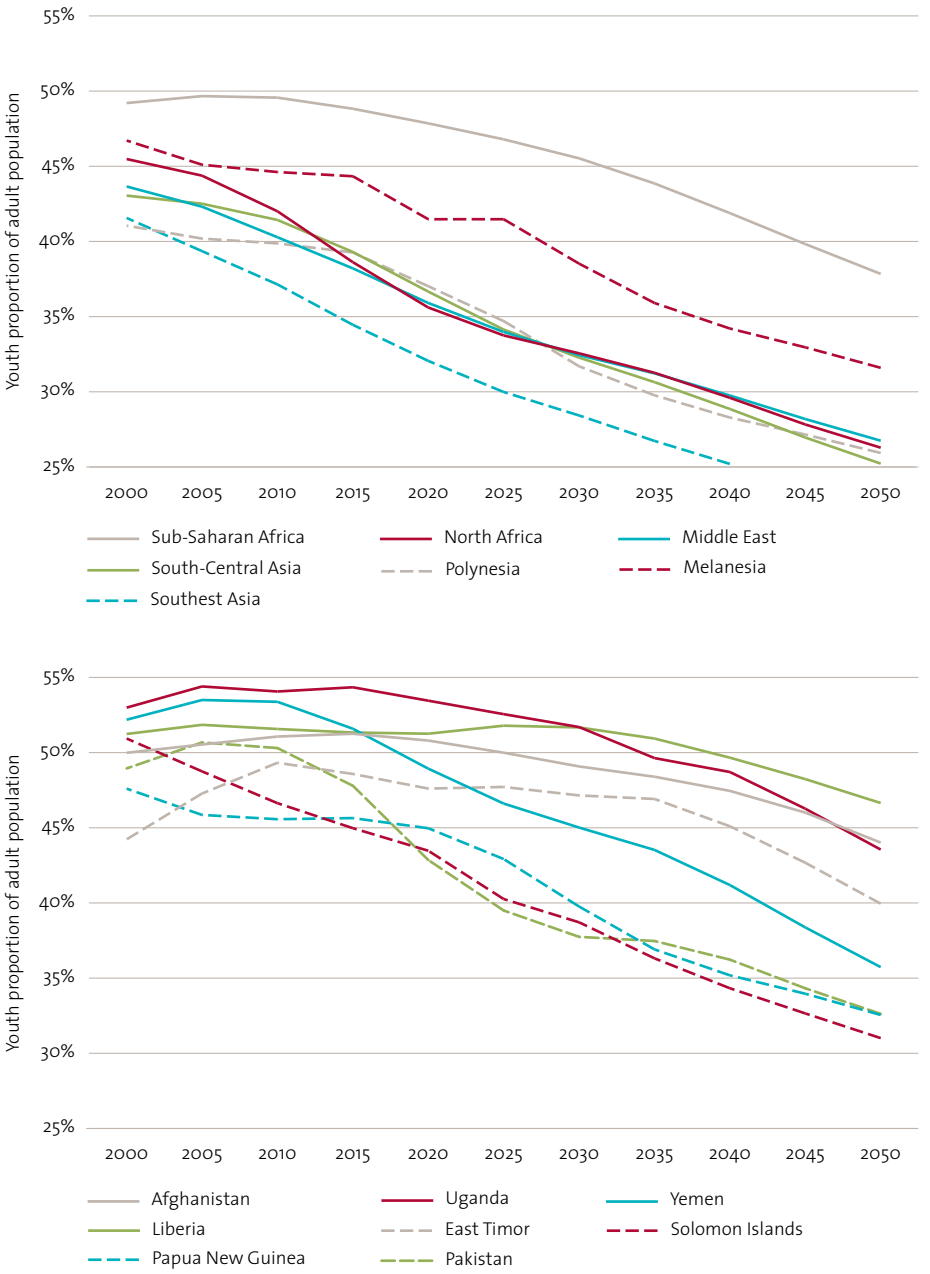
Table 5: Youth bulges and civil conflict

Proportion of young adults, 1995	Likelihood of civil conflict, 1990–2000
40% and higher	33%
30% to 39.9%	18%
Less than 30%	11%

Source: Cincotta (2003)

The good news is that the overall trend is for youth bulges to subside in the poorer regions of the world in the decades ahead, as the upper graph in Figure 14 shows. Only sub-Saharan Africa and Melanesia will continue to have youth proportions higher than 40% past 2015. Consistent with this, and as the lower graph in Figure 14 demonstrates, some particularly underdeveloped countries will continue to have relatively large youth populations through to mid-century, including some in our own region (although here the problem is less severe).

Figure 14: Proportion of young people in selected countries and regions, 2000 to 2050



Source: ASPI analysis of data from UNDP (2006)

Thus, while the overall trend is for clear and continuing improvement, large youth bulges will persist in specific areas and countries, and the problem will be most acute over the next couple of decades. As with uneven economic development, the problem will most affect those places that are already vulnerable, volatile, or both.

It's important to stress that large youth populations aren't always inimical to the stability and development of countries. In the right circumstances, countries can reap what's been called a 'demographic dividend' in the two or three decades after their bulge of young people enters the workforce. Provided that governance and economic conditions are conducive, there's a window of opportunity for productive investment to be made while there are fewer

children and elderly people to care for. This dynamic helps explain the vibrant economic development observed in China and the Asian 'tiger' economies today, and previously in Japan.

As a general rule, a high proportion of young people can be an advantage to countries that have the stability and institutional infrastructure necessary for economic growth. Conversely, a large youth population in a fractured society with limited economic prospects is likely to exacerbate pre-existing problems and increase the likelihood of instability. The fact that large youth populations can be good for some countries and bad for others is a reminder that demographics is only a small part of the complex mix of factors that determines the prosperity and stability of countries.

The fact that large youth populations can be good for some countries and bad for others is a reminder that demographics is only a small part of the complex mix of factors that determines the prosperity and stability of countries.

Urbanisation

As countries develop, a larger share of their population comes to reside in urban areas. On the whole, this is a positive sign of progress. Urban communities provide economies of scale in production and distribution, and allow more efficient delivery of health, education and public safety. Over the past fifty years, the proportion of the world's population living in urban areas increased from 33% to 51%. Between now and 2050 that figure will grow to almost 70%. Over that period, the less developed world will narrow the gap in terms of urban population. Today, the relative urban percentages in the more and less developed regions are 75% and 45%, respectively; in 2050, the corresponding figures will be 86% and 67%.

There's a measurable correlation between the rate of growth of urban populations and the likelihood of civil conflict. Table 6 shows the result of a study of 144 countries for the 1990s. The likelihood of civil conflict is more than twice as high for countries with an urban population growing at an annual rate of 4% or above.

This might simply reflect a correlation: that is, urban growth and conflict might both be attendant features of demographic transitions without a direct causal link. Though this remains a topic of debate, it's hard to describe a convincing mechanism by which urbanisation predisposes countries to unrest. Similarly, the risk posed by so-called 'megacities' in the developing world is yet to be substantiated. Humans aggregated into

Table 6: Urban growth and civil conflict, 1990–2000

Annual rate of urban growth, 1990–95	Likelihood of civil conflict, 1990–2000
4% and higher	40%
1% to 3.9%	20%
Less than 1%	19%

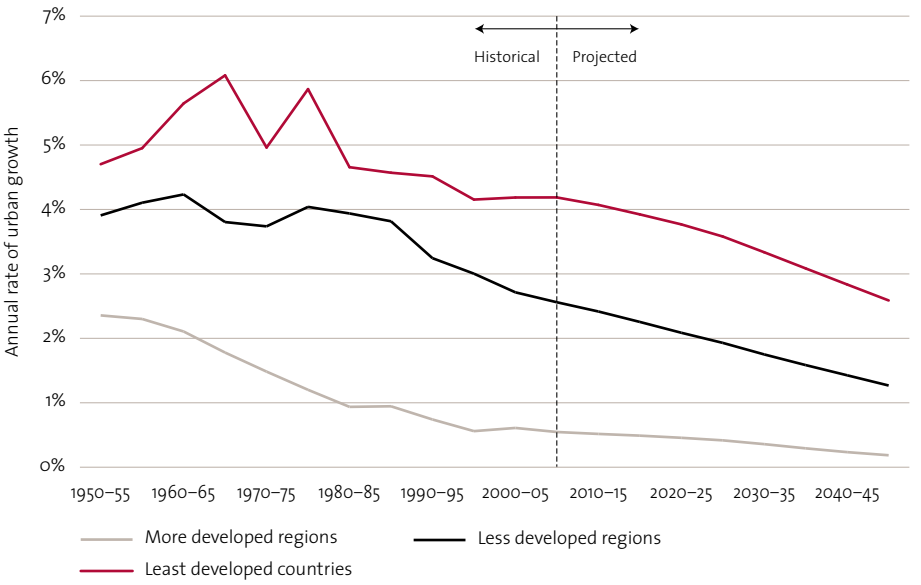
Source: Cincotta (2003)

massive cities throughout the nineteenth and twentieth centuries without urbanisation being a general security concern. While the French and Russian revolutions occurred in cities with rapidly growing populations, those in China and Vietnam were rurally based, and the American Revolution occurred when the continent did not have a population centre worth calling a city.

Sprawling metropolises have emerged in the developing world over the past century, including Mexico City (21.7 million), Mumbai (21.6 million), São Paulo (20.6 million), Cairo (17.5 million), Shanghai (15.8 million), Dhaka (12.8 million), Lahore (12.7 million), Istanbul (11.8 million) and Lagos (10.1 million). Where problems have emerged, there have always been other significant contributing factors. In any case, because the rate of urban aggregation has been slowing, and is projected to continue to do so (see Figure 15), whatever problems we face in the future will be less severe than in the past.

Yet, as always, there remain areas for concern. Consider Afghanistan and Pakistan, for example. Over the next fifteen years, Kabul is set to grow from 3.7 million to 7.2 million inhabitants and Karachi from 13 million to 19 million. Even if these countries weren't already experiencing serious civil strife, they would face a major task in expanding services to accommodate their growing urban populations.

Figure 15: The slowing rate of urbanisation



Source: ASPI analysis of data from UNPD (2007)

Population and scarcity

Growing populations in countries poorly endowed with natural resources will lead to greater scarcity. Once again, the correlation between civil conflict and the availability of basic resources of cropland and water in poorly developed countries is all too clear. Table 7 gives the results of a study of 144 countries for the period from 1990 to 2000. The likelihood of conflict is twice as high for countries with low per capita cropland and fresh water. Aside from these statistics, anecdotal evidence of scarcity contributing to conflict is easy to find in Chad and Sudan today.

Table 7: Cropland and freshwater availability and civil conflict, 1990 to 2000

Cropland 1995 (hectares per person)	Renewable fresh water 1995 (cubic metres per person)	Likelihood of civil conflict 1990–2000
Less than 0.21	Less than 1,667	30%
0.21 to less than 0.35	1,667 to less than 3,000	29%
0.35 or more	3,000 or more	13%

Source: Cincotta (2003)

Despite overall growing prosperity, poverty will fester in countries that lack the basic resources to support their populations. Today there are twenty countries below the cropland scarcity benchmark of 0.07 hectares per person; in 2025 there will be twenty-nine. Over the same period, the number of countries below the renewable freshwater scarcity benchmark of 1,000 cubic metres per person will grow from 15 to 23. This confirms what we already knew: amid a world of growing prosperity, poverty will persist in some unfortunate countries.

Population and disease

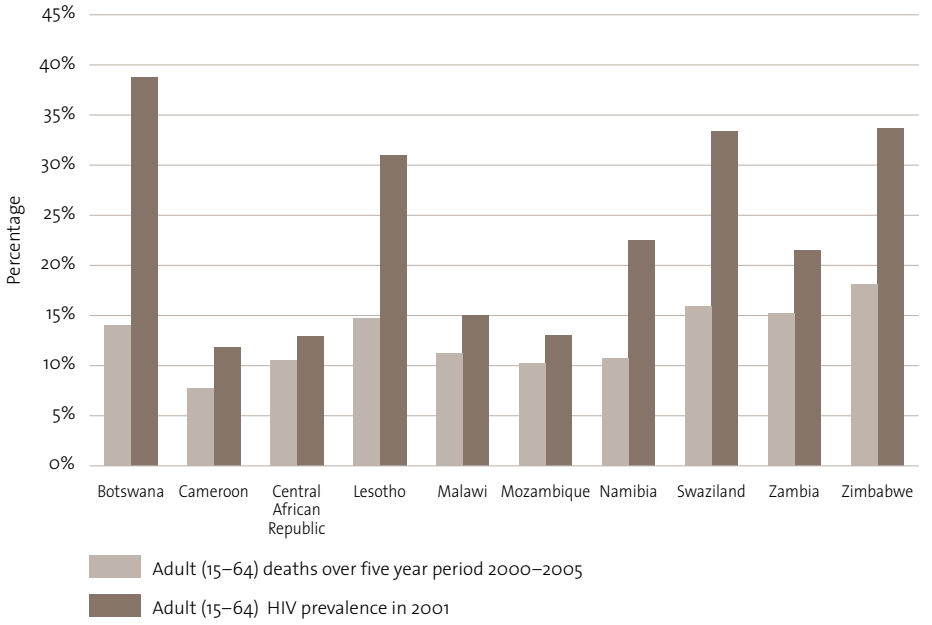
Despite rising populations, the WHO projects that by 2030 the global burden of disease (as measured in years of healthy life lost) will have decreased by 30% on a per capita basis, mainly as a result of economic growth. Even in the case of pandemics like avian flu, it's far from clear that the risk will change as improved public health and sanitation services offset increased population density. Between now and 2030, the population density in the less developed regions will increase by between 16% and 32%, whereas per capita GDP in non-OECD countries is projected to grow by between 83% and 122%.

One area in which disease and demographics come together is HIV/AIDS. Unlike any other disease, AIDS causes 90% of its fatalities in the working-age population. This gives AIDS the potential to deplete a country's workforce and thereby undermine its economy. Regrettably, this is already occurring in parts of Africa today (as shown in Figure 16, which includes only those countries with double-figure HIV infection rates).

If nothing else, losing a sizeable proportion of the adult workforce can condemn a country to perpetual poverty.

While it's not possible to draw a statistical link between AIDS and increased civil conflict or state failure, many plausible scenarios have been put forward. This report will not repeat those scenarios, but simply notes that the unfolding catastrophe can hardly bolster stability. If nothing else, losing a sizeable proportion of the adult workforce can condemn a country to perpetual poverty. As for future prospects, the US National Intelligence Council estimates that the current global pool of 33 million HIV-positive people will grow to only 50 million by 2025, implying that the spread of AIDS will be largely contained and presumably localised in areas like sub-Saharan Africa, where public health programs are ineffective.

Figure 16: AIDS prevalence and working-age deaths in selected countries



Source: Cincotta (2003)

It's the exceptions that matter

The pattern is the same across the four factors so far examined—youth bulges, urbanisation, scarcity and disease. Amid a world of growing prosperity and stabilising trends, some high-fertility countries will continue to have unfavourable demographics in the decades ahead, especially in the next twenty years.

Prospects for each of the more than one hundred developing countries around the globe differ markedly. This section briefly surveys those regions and countries where either the problems are likely to be greatest or Australia's interests are most closely engaged.

Sub-Saharan Africa

Aside from already suffering from extensive conflict and poverty, many of the countries of sub-Saharan Africa will continue to have unfavourable demographic characteristics for some time to come, including Burundi, Congo, Eritrea, Ethiopia, Gambia, Kenya, Liberia, Madagascar, Malawi, Mauritania, Rwanda, Sierra Leone, Somalia and Tanzania. To make matters worse, the limited geostrategic importance of much of the region will continue to limit the willingness of the West to provide anything more than token assistance with security. The combination of systemic instability, poor governance, limited economic prospects, high population growth and western indifference means that much of sub-Saharan Africa will struggle in the decades ahead. While this is highly regrettable from a humanitarian perspective, it's unlikely to have a direct impact on Australia beyond the present trickle of people seeking refuge and safety.

Central Asia

While the purely demographic factors in Central Asia are less acute than elsewhere, Australia's military engagement in the region makes it worth noting the demographic prospects of countries like Afghanistan and Pakistan. Both are set to experience relatively

high rates of population growth and have large youth populations in the years ahead (as shown in Table 4). Long before that occurs, however, both countries will have to overcome serious near-term challenges that have little to do with demographics. The longer it takes for stability to be returned to the region, the greater the risks due to population growth.

Middle East

The demographic prospects of the nations of the Middle East, apart from poor countries like the Occupied Palestinian Territory and Yemen, are not by themselves particularly alarming. However, as for Central Asia, the combination of the innate volatility and economic importance of the region as an energy supplier, its rising populations and narrow economic prospects does not bode well for the future. To a large extent, this reflects the failure of countries to invest their oil revenues in a sustainable economic base for their people. Even more so than in Central Asia, the problems faced by the Middle East are due to a range of factors of which demographics is only a limited part.

South Asia

Although the overall population growth predicted for India is breathtaking, the situation should be manageable with continued economic growth. We can be less optimistic about Bangladesh, Bhutan and Nepal, whose combination of limited prospects, poor geography and unfavourable demographics remains a concern. And, as in sub-Saharan Africa, the marginal economic and strategic importance of these countries makes them unlikely to attract substantial assistance from the developed world. Consistent with this, and as is the case in sub-Saharan Africa, the most direct impact on Australia is likely to be through people seeking refuge—as already occurs due to the conflict in Sri Lanka.

The Pacific and East Timor

Although Polynesia is close to being demographically stable, the prospects for Melanesia and East Timor are a matter for serious concern, as the statistics in Table 4 show. The depth of the problem and its potential impact on Australia are explored at length in the next chapter.

Ageing

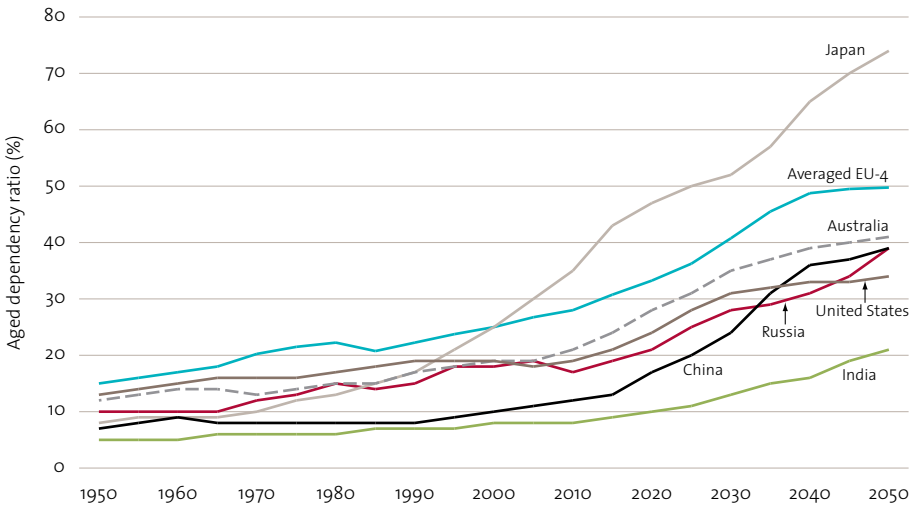
At the same time as many developing countries are experiencing youth bulges, much of the West and Japan will be increasingly burdened with ageing populations—the aftermath of population booms and subsequent fertility reductions in the postwar period.

By 2050, the median age in the more developed regions will be 45.7 (up from 37 today), compared with 36.9 (currently 24) in the less developed regions. In some countries, the impact of ageing will be even more pronounced. Consider Figure 17, which plots the aged dependency ratio (the ratio of people over the age of 65 to those aged between 15 and 64) for key countries. It's hard not to be struck by the extent to which Japan and the EU-4 will age. What's important about the aged dependency ratio is that it's a rough measure of how many retired people there are per worker. In Australia, for example, there will be 40 retired people for every 100 workers in 2050, compared with 11 per 100 today. In Japan, the figure is set to rise to 75 per 100.

It's sometimes argued that ageing will accelerate the decline of the traditional powers in favour of the newer ones beyond its direct economic impact (which is accounted for in the estimates presented in the previous chapter). Two supporting arguments are offered: first, because the fiscal burden of ageing is claimed to be so large that it will force countries to cut

defence spending; second, because it is assumed that countries with ageing populations will be either unable or unwilling to raise armed forces from the limited pool of young people available. Those propositions are explored in this section.

Figure 17: An ageing world



Source: Data from UNPD (2006)

Depending on how retirement income and services are funded in a country, the resulting fiscal burden can be appreciable.

The cost of ageing

Government budgets in many developing countries will be hit hard by ageing. As people retire, pension, health and aged care costs will rise at the same time as tax revenues erode. Depending on how retirement income and services are funded in a country, the resulting fiscal burden can be appreciable. Those countries with unfunded universal pension schemes are likely to be the hardest hit.

Table 8 shows the estimated fiscal impact of ageing on a selection of countries. To put the estimates in context, the table includes:

- total tax revenues as a share of GDP, which gives a rough indication of the room available to increase taxes
- government debt as a share of GDP, which shows how much is owed by all levels of government
- household savings ratios, which measure the percentage of private disposable income that is currently saved and that might be used to cover future costs
- law, order and defence spending as a share of GDP.

Table 8: The fiscal impact of ageing

	Age-related spending 2000 (% GDP)	Change to age-related spending 2000–2050 (% GDP)	Total tax revenues 2005–06 (% GDP)	Government debt 2006 (% GDP)	Household savings 2008 (% of disposable income)	Law, order & defence spending 2005–06 (% GDP)
Australia	16.7	5.6	30.9	16.1	–0.7	2.3
United States	11.2	5.5	28.2	61.9	0.6	6.4
United Kingdom	15.6	0.2	37.4	46.6	–0.1	5.1
France	18.0a	6.4a	44.5	70.9	12	3.3
Germany	17.5a	8.1a	35.7	69.3	10.6	2.7
Italy	19.7	1.9	42.7	118.7	10.1	3.5
Japan	13.7	3.0	27.4	179.7	3.1	2.3
Sweden	29.0	3.2	50.1	53.9	–	3.0
New Zealand	18.7	8.4	36.5	27.2	–	3.0
Netherlands	19.1	9.9	39.5	54.7	6.9	3.1

a Does not take into account reduced youth-related spending.

Note: The Global Financial Crisis will cause government debt to rise significantly over the next several years.

Sources: Visco (2001), Dang (2001), OECD (2008)

It certainly looks as though many developed countries will face problems in the future. In all but two of the countries covered in Table 8, the additional fiscal burden of ageing will exceed the current level of law, order and defence spending by mid-century. This doesn't mean that national security will become unaffordable.

It's a long time before 2050 arrives, and countries are already enacting policies to deal with the problem, like initiatives to increase workforce participation (for example, by encouraging people to stay on past nominal retirement) and progressively shifting responsibility for retirement income from state pensions to individual superannuation accounts—in short, all of the things that Australia has done in recent years. In many cases, the necessary policy shifts will be very difficult, especially for the US, which appears to be wedded to an unsustainable regime of high discretionary spending and inexorably rising nondiscretionary 'entitlements'.

If these sorts of measures prove inadequate, then some combination of reduced government spending elsewhere and cuts to private consumption (i.e. higher taxes) would be necessary. Fortunately, the option of raising taxes over the longer term mightn't be as bad as it sounds. As we saw in Chapter 2, projected per capita GDP growth in developed countries will deliver greater individual prosperity in the decades ahead—around a twofold increase in the US, for example. This growing prosperity will make it possible to spend more money on public goods like defence and aged-related spending while still delivering increased standards of living. (A detailed analysis of Australia's particular circumstances can be found in the 2008 ASPI report, *Strategic choices: Defending Australia in the 21st century*.)

The essential point is that, although meeting the cost of ageing will be a devilish political problem for many countries, it's not an economic catastrophe by any measure.

Still, just because a country can afford to maintain its defence spending doesn't guarantee that it will. The clear trend since World War II has been for western allies, including Australia, to free-ride in defence spending and operational deployments at the expense of the US.

Rising fiscal pressures will only increase the domestic political impetus for western countries, other than the US, to reduce their share of the common defence burden. This temptation will increase as the size of the US economy draws further ahead of those of its allies over the decades.

Because of its one-child policy, China will also have an ageing population in the twenty-first century. By 2050, the aged dependency ratio in China will have grown to 39% compared with 12% today. While limited expectations of government support will cushion the blow for the government (75% of Chinese workers are not covered by a public pension scheme), there still remains the question of how older people will be cared for. To some extent, China's relatively high household savings rate of around 20% will offset the problem, but the Chinese Government will eventually have to echo the types of policies that western countries are already developing to encourage participation and self-funding retirement income. In the longer term, the transition to a sustainable fertility policy is a policy dilemma to be faced. None of this will be easy, but nor will it economically hobble the Middle Kingdom.

Too few to fight

It's easy to dismiss the worry that ageing western populations will have too few young people to sustain their defence forces—it's arithmetically wrong. The size of the operationally effective defence forces in developed nations is, and will remain, a slight fraction of the available labour pools. In Australia, for example, our permanent defence force is less than 60,000 strong and only requires around 6,000 recruits per year. This amounts to less than 0.24% of the 2.5 million-plus people aged 18 to 26 who will be continuously available to recruit out to 2050.

It's been more than sixty years since 'the fighting strength of armies was limited by the manhood of their countries', but across the developed world countries struggle to recruit adequate numbers to maintain their much-diminished standing forces.

Demographically, there are few western countries that could not—if they wanted—raise an army even larger than the massive formations they created to fight for the fate of civilisation in World War II. It's been more than sixty years since 'the fighting strength of armies was limited by the manhood of their countries', but across the developed world countries struggle to recruit adequate numbers to maintain their much-diminished standing forces. And they're unwilling to deploy what forces they have, lest they incur casualties. It's been suggested that the shrinking size of families is at the heart of this problem. While that might be plausible as an explanation, there are certainly other entirely nondemographic factors at play.

For one, there are many more rewarding career options available to young people than in the past. For another, in the modern day, developed countries use military force more for 'security' than actual 'defence'. No western country currently faces more than a remote prospect of using its military forces to directly defend itself. The effort that a country and its

people might be willing to make to bring stability to a distant land is far less than the effort they would make to defend themselves. Finally, as long as the US is willing to step up, the rest of the developed world will continue to stand easy. Even for the US, the absence of direct threats will continue to limit its defence effort.

While none of this is demographic in origin, it does not bode well for the willingness and capacity of developed countries to use armed force on a scale that is effective. The half-hearted effort by countries, other than perhaps the US, in Afghanistan demonstrates the point.

Migration

Migration has a significant impact on the demographics of many countries. In 2005, an estimated 3% of the world's population (191 million) lived outside their countries of birth. Although global migration is a complex web of ebbs and flows, each year around 2.5 million people leave the less developed regions to live in the more developed world. Large flows of people also occur within the less and more developed regions.

Many countries, such as Australia and the US, owe their rapid development to large-scale immigration.

On the whole, immigration is a positive thing. Many countries, such as Australia and the US, owe their rapid development to large-scale immigration. Remittances from expatriates are an important economic factor in many less developed countries, and migration has the potential to help mitigate the impact of ageing in developed countries.

On the other side of the ledger, unplanned migration can strain services in receiving countries and lead to internal and even international tensions. This is already the case in the Middle East and sub-Saharan Africa, where around 7 million refugees currently reside. In addition, the unmet demand for migration has given rise to illegal people movements and organised people-smuggling. It's been estimated that between a third and a half of new entrants to most developed countries arrive illegally. Even legal migration has its dark side when scarce skilled individuals in poor countries—including doctors and nurses—are lured away to meet demand in rich countries.

It's difficult to predict the scale of future migration because it depends on decisions yet to be made by individuals and governments. While rising standards of living in the less developed world will on average reduce the motivation for people to leave, there are likely to be enough areas of misery to maintain the urge to relocate. At the same time, the immigration policies of potential receiving countries are open to revision; if developed countries want to mitigate the cost of age-related spending, rates could rise significantly.

The latest UN population projections assume that migration, legal and otherwise, to the more developed regions will moderate slightly in the years ahead and level off at around 2.3 million entrants a year (representing 1.8% of the population in the more developed world). Meanwhile, within the developing world, large-scale internal displacements and cross-border

migration will continue whenever a crisis emerges. The estimated 4.7 million people who fled their homes following the US invasion of Iraq show how large people movements can be in a crisis. From time to time, these sorts of mass movements will have adverse security consequences beyond their regrettable human impact. Still, not only is none of this new, but we have no evidence that the future will present more serious problems than we have today.

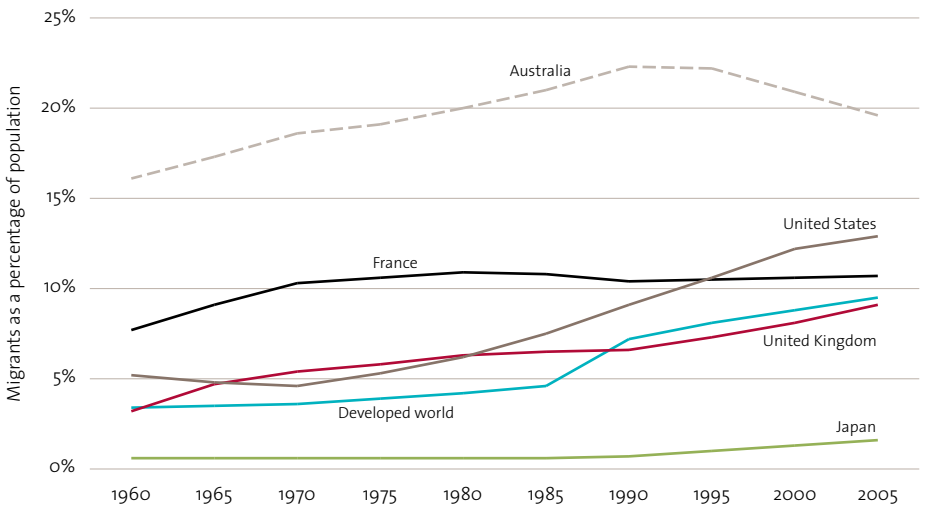
Identity and diaspora

It's a miserable fact of human history that people are willing to kill each other for no better reason than that they belong to a different ethnic, religious or language group. Identity conflict continues to this day in many corners of the world and will continue into the future. Space prohibits a deep analysis here of the many situations in which disparate peoples have been thrown together in a single place, such as in Fiji, Israel and Malaysia. While each such situation has a demographic character, it's the specific political and social circumstances that predispose some to conflict and others to harmony. Understanding each requires a level of detail that a survey like this can't hope to achieve.

Instead, this report pursues the more modest goal of understanding the capacity of developed countries like Australia to sustain the growing diversity that's been developing through migration. Even if migration levels remain where they are today, the steady accumulation of migrants will continue to shape the religious, ethnic and cultural composition of many developed countries. If those levels rise as countries try to broaden their tax bases to pay for ageing, the effect will be even more pronounced.

Figure 18 shows the growing migrant population of selected developed countries and the developed regions as a whole from 1960 to 2005. Because the children of migrants are an important part of any community, the full demographic impact of migration is arguably larger than implied by these raw figures. Note that Australia's migrant stock is much larger than that of any of the other countries displayed, although diversity was limited by the high proportion of British migrants and the retention of the racist White Australia policy until 1966.

Figure 18: Migrants in the more developed world



Source: UNPD (2005)

Even though migrants add to the economic and cultural vitality of the societies they move to, there are unavoidable security implications. However, this report argues that the security risks are both limited and entirely manageable in developed countries.

To begin with, integrating migrants into receiving societies doesn't always go smoothly. Migrants can come to feel marginalised and even discriminated against (and not always without reason). Regrettable as this is, it's not in itself a security issue. In the developed world, it's very rare that things spill over into civil strife. While the 2005 Cronulla riots in Australia and the 2001 Bradford, Birmingham and Oldham riots in the UK were all clear breaches of public security, they were isolated events that didn't form part of a continuing pattern, and they certainly didn't imperil the stability of government.

Next, we need to acknowledge that, to varying extents, migrants and their descendants will continue to identify with their country of origin and even with its interests. This is neither ominous nor inappropriate. In Australia, the close affinity that most Australians felt for Britain during the twentieth century helped to shape our foreign policy during that period. It's certain that a more diverse range of views will shape our interaction with the world during this century. At times there might be disagreements between competing views, but fortunately we have a democratic system that allows differing views to be heard and judged on their merits. It is only when people go outside the system and use violence that a problem arises.

The terrorist attacks in London and Madrid and the planned attacks in Australia are cases in point. While the presence of Muslim communities in Australia, the UK, the Netherlands, Spain and the US was a necessary precondition for the emergence of 'home-grown' Islamist terrorism in those countries, that fact needs to be kept in context. The numbers of individuals involved in those crimes represented a tiny fraction of the sizeable Muslim populations of the countries involved. For example, the UK has close to 1.6 million Muslims in a population of 61 million, and the Netherlands has 850,000 Muslims amid a population of less than 17 million. It's just as important to remember that the authorities have successfully managed the risk of further attacks, in part through cooperation with migrant communities.

Looking at the seemingly intractable strife involving identity politics in the Middle East, the Balkans and Africa, it's surprising how well people from diverse cultures and religions are able to live together in developed countries. Perhaps that success comes from sharing in prosperity rather than scarcity. If so, then we can reasonably hope that, as prosperity spreads around the globe in the coming decades, other diverse groups that have been thrust together by history can learn to live together.

Gender asymmetry

Among the list of demographic factors that are sometimes raised as looming security problems is the gender imbalance in India and China due to selective reproduction. The gender ratio at birth in India is 108 males per 100 females, which equates with the asymmetry observed since the 1950s (so the problem has been around for a long time). In China, the situation is less easy to ignore. In the 1950s the gender ratio was 108 men per 100 women, whereas for the past fifteen years the gender ratio at birth has been around 120 per 100.

Whether this will translate into a security problem is unclear. While the argument that a large number of surplus males will lead to political instability has gained some academic currency,

it is not backed up by convincing historical precedents. Even less plausible is the proposition that the Chinese Government might feel compelled to recruit the surplus men into the military and thereby become more militarily aggressive—on a per capita basis, the People's Liberation Army is smaller than the Australian Defence Force. Thus, while the emerging gender imbalance in China is a real and serious social problem, any security implications are speculative.

Natural disasters

It's a simple matter of arithmetic that the more people there are on the planet, the higher the risk that some of them will fall foul of natural disasters like hurricanes, tsunamis, droughts, earthquakes and volcanic eruptions. Between 1994 and 2003, an average of around 255 million people were adversely affected by natural disasters each year. To a first approximation, if the global population increases from 6.5 billion to 9.2 billion over the next forty-five years, a 42% increase in the number of people thus affected will occur. The actual situation will probably be worse because much of the projected increase in human population will occur in poorer regions that are ill-equipped to deal with adverse events, thereby escalating the consequences. Moreover, population growth in less developed countries will force many people to live in less favourable terrain, where flooding or drought occurs. If that isn't enough, the forecast is for climate change to make matters even worse as the century plays out—although, as we've seen, large-scale economic consequences are some way off.

Helping the victims of natural disasters is more than a humanitarian imperative. Increasingly, the assistance that countries render each other (or the lack of it) helps to shape their relationships, for better or worse. For example, the rapid assistance that Australia provided to Indonesia following the 2004 Boxing Day tsunami was an important step in the rapprochement between the two countries after their rift over East Timor.

It will be in the interests (humanitarian and otherwise) of developed countries like Australia to be ready to help as increasing numbers of people fall victim to natural disasters in the decades ahead. Fortunately, growing prosperity will increase the number of countries that can help themselves and others.

Demography and destiny

The demographic factors considered in this chapter are but part of a broader system of social, political and strategic factors that will shape the future. In this sense, demography is not destiny.

In developing countries, many nondemographic factors will be critical to stability and prosperity. Key among those factors will be good governance, competent and corruption-free institutions, social equity, and the rule of law. Irrespective of the shape of a country's population, systemic problems in one or more of these areas can heighten the likelihood of trouble. Conversely, a country that is competently and justly governed will be more able to weather the stresses and strains that its demographics might impose. In general, therefore, although unfavourable demographic characteristics can predispose a country to instability, they are unlikely to be the sole causal agent. Rather, adverse demographic factors exacerbate other unfavourable trends and characteristics.

Although demographics constrains a country's economic weight by limiting the size of its workforce, myriad policy choices determine the productivity of the workforce and therefore its prosperity.

The situation is similar for the more developed countries. Although demographics constrains a country's economic weight by limiting the size of its workforce, myriad policy choices determine the productivity of the workforce and therefore its prosperity. Moreover, although economic and strategic weights are broadly correlated, the influence and power that a nation can muster also depends upon a number of non-economic, and therefore nondemographic, factors. For example, a country's diplomacy, values and cultural appeal can help determine its sway over others.

For developed and developing countries alike, although demography is an important factor, it's far from the whole story.

Chapter 5

QUESTIONS FOR AUSTRALIA

Many issues relevant to Australia have been raised and dealt with in the preceding chapters. This chapter explores two specific issues that deserve special attention: our country's population policy (or the absence thereof) and the challenges in our immediate neighbourhood.

Populate or perish

On 12 September 1803, Lieutenant John Bowen disembarked from HMS *Lady Nelson* and came ashore at Risdon Bay on the Derwent River in Van Diemen's Land. Bowen, who may have been as young as eighteen at the time, had a simple mission: establish a settlement to keep the French out. To achieve this, he had two officers and thirteen troops of the New South Wales Corps, four free-settler families and around fifty convicts—less than 100 of the 7,000 Europeans then in Australia. Such was the first deliberate step to assert and assure our sovereignty by populating the vast territory at our disposal. Less than sixty years later, in 1860, Australia's population exceeded a million and self-sustaining colonies had been established around the continent.

A close call with Japanese imperial ambitions in the 1940s reignited fears that Australia was too lightly populated to defend itself. Even before the war was over, the Chifley government conceived an ambitious program of nation building centred on large-scale immigration. The goal was unambiguous. As Australia's first Immigration Minister, Arthur Calwell, put it in 1946:

> The call to all Australians is to realise that without adequate numbers this wide brown land may not be held in another clash of arms, and to give their maximum assistance to every effort to expand its economy and assimilate more and more people who will come from overseas to link their fate with our destiny.

The ensuing level of immigration was large by postwar international standards. From 1950 through to 1970, the annual net migrant influx

was around 9 per 1,000 persons, and the average for the half-century was 6.7. In comparison, the US, which is usually considered a high-immigration country, never exceeded the rate of 4.5 per 1,000 following World War II and managed an average of less than 3 per 1,000 over the same period. The result is that Australia has around 7 million more people than it would have otherwise had—4.5 million people born overseas and their 2.5 million descendants.

With many of our Asian neighbours achieving rates of economic growth significantly faster than our own, the questions are: Should Australia increase its migrant intake to bolster our economic and strategic weight in the region? Should we ask more people to 'link their fate with our destiny'?

On the surface, this might seem to make sense. Australia currently has a larger economy than any of its Southeast Asian neighbours, but on current trends Indonesia will reach parity in 2030 and then draw ahead. It's tempting to conclude that we should strive to stay in first place.

In the long run, globalisation will ensure that China and India will come to dwarf us in economic size, and populous countries like Indonesia will reach parity and then surpass us—no matter what.

But that argument is at best tenuous. As we have seen, less developed countries with large populations can achieve high rates of economic growth by shifting low-productivity workers into more productive jobs. For a developed country like Australia to counter that advantage would require a very high rate of immigration. A little arithmetic shows why this is the case. Treasury's projections of Australia's rate of economic growth have it slowly declining from around 3% this decade to below 2% by mid-century. In comparison, indicative long-term Asian growth rates are ~4–5% for Southeast Asia, ~5% for India and ~6% for China. Maintaining current relativities would require Australia to boost its economic growth by 2–3%.

Now, to a first approximation, immigration adds to the rate of economic growth in proportion to the rate at which the workforce grows. To add, say, an extra 2.5% of economic growth to the Australian economy through migration, the workforce would need to grow by an extra 2.5%. Assuming, not unreasonably, that migrant workforce participation rates are the same as those in the broader economy, this translates to a net migration rate of 30 per 1,000, or more than three times the peak of postwar migration. (The net migration rate to Australia hovered around 5 per 1,000 between 1994 and 2004, but has since grown to 9 per 1,000.)

Even then, this sort of heroic effort would only delay the inevitable. In the long run, globalisation will ensure that China and India will come to dwarf us in economic size, and populous countries like Indonesia will reach parity and then surpass us—no matter what. And while it might have made sense for Arthur Calwell to call for increased migration in the aftermath of a conflict that saw every sinew of national capacity turned to the war effort, no such imperative exists today.

If we wanted to bolster our economic and strategic weight through migration, even though it would only give us temporary respite, the collateral impact would have to be taken into account. Here the picture is mixed. While Australia has the room and resources for more people, a larger population would demand increased exploitation of the environment, more extensive urban sprawl, more dams, fewer forests and longer commutes to work.

And although a larger workforce would soften the fiscal impact of age-related costs, the change to per capita GDP would be moderated because the larger economy would be shared among a larger population. While business would welcome a larger Australian population (it has a vested interest), the net benefit for individual Australians of a much larger population is less clear. In any case, it's upon these issues that Australia's population policy should be decided, free of unattainable notions of moving up a rank in the strategic league table.

Australia's security depends in part on the stability and security of our immediate neighbours.

The neighbour's kids

Australia's security depends in part on the stability and security of our immediate neighbours. We cannot be secure in an insecure region. Fortunately, our largest and most populous neighbour, Indonesia, is now a functioning secular democracy with adequately effective institutions and good economic prospects. If problems do emerge within or from Indonesia, they won't be the result of demographics. With a fertility rate of 2.18 births per woman and a youth ratio of 36% (down from a peak of 46% in 1985), Indonesia is well down the path of demographic transition. Not so for many of our other neighbours.

Table 9 lists key demographic and economic data for the seven largest countries in our immediate region, excluding Indonesia. Space and absence of data prevents the inclusion of Kiribati, Tuvalu and Nauru in the table, although they will be considered below. For obvious reasons, the table does not include those Pacific countries that are linked by an act of free association or otherwise with the US, France or New Zealand.

Several things stand out from Table 9. On the UN Human Development Index, three of the seven countries rank among the fifty least developed nations: Papua New Guinea ranks below Haiti and above Cameroon, while East Timor falls between Angola and Togo. Consistent with relatively low levels of development, four of the countries are still experiencing high rates of population growth. By 2050, the populations of Papua New Guinea, Solomon Islands and Vanuatu are projected to have more than doubled from 2000 levels, while East Timor's will have grown more than fourfold. Although all the countries other than East Timor have passed the peak of their youth bulges, it will not be until 2015 that Fiji falls below a youth proportion of 40%; 2025 for Vanuatu; 2030 for Samoa, Tonga, Solomon Islands and Papua New Guinea; and 2050 for East Timor.

Economic growth rates over the past decade for Papua New Guinea, East Timor, Solomon Islands and Vanuatu have all been lacklustre (especially when compared with their rates of population growth). A number of factors underlie this poor performance, including physical

Table 9: The neighbourhood

	Papua New Guinea	East Timor	Fiji	Solomon Islands	Vanuatu	Samoa	Tonga
Human Development Index 2008	0.516	0.483	0.743	0.591	0.686	0.760	0.774
Human Development Index ranking (179 countries) 2008	149th	158th	103rd	134th	123rd	96th	85th
Population 2010 (thousands)	5,381	819	802	415	190	177	98
Population 2050 (thousands)	11,155	3,462	910	955	454	215	123
Population growth 2005–2050	107%	323%	13%	103%	139%	21%	26%
Youth proportion (15 to 29 years) 2010	0.46	0.49	0.40	0.47	0.47	0.42	0.48
Youth proportion (15 to 29 years) 2030	0.40	0.47	0.32	0.39	0.38	0.35	0.38
Youth proportion (15 to 29 years) 2050	0.33	0.40	0.26	0.31	0.30	0.29	0.31
Average annual GDP growth 1997–2007	1.1%	1.1%	2.2%	0%	1.4%	4%	2.5%
Gross national income (GNI) per capita	850	1,510	3,800	730	1,840	2,430	2,320
Foreign aid / GNI (US$ 2007)	5.7%	16.3%	1.7%	67.3%	13.5%	7.8%	13.1%
Total foreign aid (million US$ 2007)	317	278	57	248	57	37	30
Australian share of aid 2007	82.6%	23.4%	35.4%	70.2%	38.2%	35.1%	30.3%

Sources: UNPD (2006), OECD (2007), World Bank (2007), UNDP (2008)

isolation, patchy governance, undeveloped infrastructure and, in some cases, civil strife. The smaller island states face the additional difficulty of achieving economies of scale with tiny populations. Tonga and Kiribati have populations below 100,000, and Tuvalu and Nauru are close to 10,000. Understandably, foreign aid makes up a significant share of gross national income (GNI) in all but a couple of the Pacific island states.

With so many neighbouring countries still working their way through their demographic transitions, we shouldn't be surprised that instability has arisen. Since the mid-1990s, Australian military forces and police have responded to events in Papua New Guinea, Solomon Islands, East Timor, Fiji and Tonga. The danger is that civil strife will disrupt economic development and leave one or more of these countries locked in a vicious circle of instability and stagnant development. There's little doubt that this is what would have occurred in Solomon Islands and probably East Timor in the absence of outside help. Even a relatively moderate level of disturbance can be enough to discourage the investment essential for growth.

While many outside countries are concerned enough to provide aid, it ultimately falls to the region to solve its own problems. In practice, the heavy lifting is left to Australia with the support of New Zealand. Geography gives Australia an abiding interest in the security of our neighbours, and history imparts a sense of responsibility. It's no accident that Australia is

the largest single aid donor to the countries in the list above. While the ongoing instability in sub-Saharan Africa has far graver human consequences, Australia's interests are much more vitally engaged closer to home.

Given the established correlation between inadequate development and instability, it's likely that Australian troops and police will spend more time helping our neighbours in the years ahead.

No single action will ensure the future of the fragile states on our periphery; development, governance and security must be improved in concert. Unfortunately, in those countries where populations are growing quickly, the task will get more difficult in the years ahead. It's sobering that populations have been growing more quickly than the economies in five countries in Table 9. Other factors, like the mounting impact of HIV/AIDS in Papua New Guinea and the vulnerability of small island states to climate change, further erode confidence in the region's future. Given the established correlation between inadequate development and instability, it's likely that Australian troops and police will spend more time helping our neighbours in the years ahead.

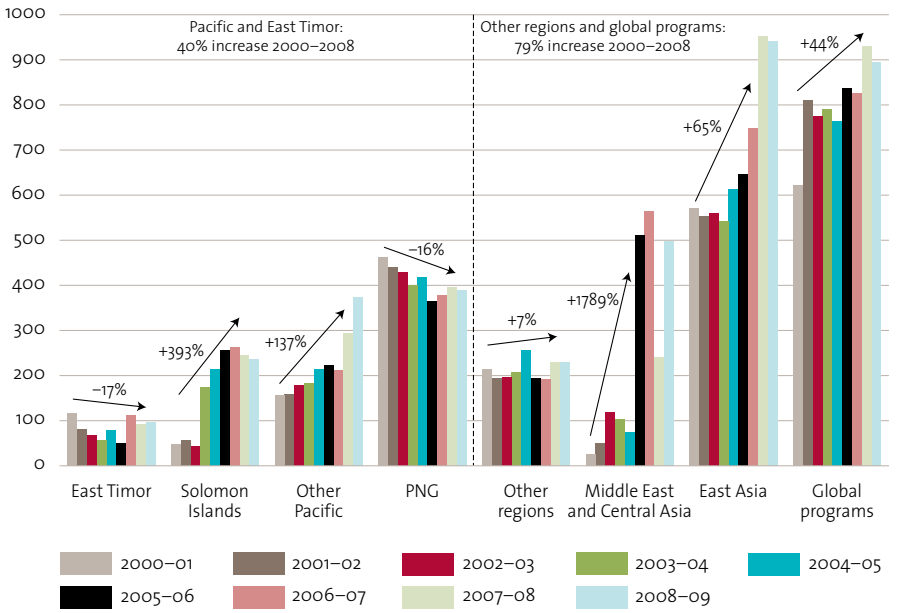
This is a case where an ounce of prevention is worth a pound of cure. It's hard to see why a greater effort wouldn't be rewarded by improved long-term strategic and humanitarian outcomes. The fact that past policies have allowed the situation to degenerate to where it is today reinforces this point.

The Howard and Rudd governments seem to have recognised this. After allowing Australian aid to fall to a 30-year low of 0.25% of GNI, in 2005 the Howard government announced that it would increase Australian aid to $4 billion per year by 2010–11, effectively doubling Australian aid in nominal terms. The incoming Rudd government upped the ante by committing itself to 0.38% of GNI in 2011–12, which (at the time) represented around $5 billion. The momentum is gathering: Australian foreign aid grew in real terms by 65% since the start of the decade to reach $3.7 billion in 2008–09.

But the devil is in the details. Figure 19 provides a snapshot of how Australian aid has grown and evolved this decade. Aid to both Papua New Guinea and East Timor has fallen, while funding has grown strongly in other areas, including the Middle East, Central Asia and global programs.

Australian aid serves a variety of purposes. Those promoting our bid to secure a UN Security Council seat in 2013–14 are at pains to stress Australia's support for UN global programs. And it would be naive to view some Australian aid as anything but an adjunct to broader diplomatic efforts—why else would we provide $35 million a year of aid to China, which has its own space program and nuclear arsenal? We can only hope that, as the level of Australian aid increases, our global ambitions don't trump our regional responsibilities and self-interest.

Figure 19: Australian overseas aid, 2000 to 2008 ($ million)



Source: AusAID (2000–2008)

Aid is but one part of the engagement needed to help our neighbours navigate the difficult times ahead.

Aid is but one part of the engagement needed to help our neighbours navigate the difficult times ahead. The Australian Government has been successfully negotiating bilateral agreements on aid with Pacific countries under the banner of partnerships for development and security. This is to be applauded. However, aside from a very limited trial of guest workers, little has changed to deepen Australia's engagement with the region beyond what it was several years ago.

Chapter 6

WHAT TO DO

On the whole, the future looks good. As has been the case for the past half-century, economic development will continue to lift people out of poverty despite growing populations. From a humanitarian perspective, this is unambiguously a good thing. From a security perspective, it's surely better than the alternative of worsening poverty.

Yet challenges lie ahead, partly because of the tectonic geopolitical shifts underway and partly because some countries will be left behind even as most prosper.

Given Australia's response to heightened fears of terrorism, illegal migration and insecurity in our near region over the past decade, we're already well placed to deal with many of the other challenges that can be anticipated.

On the geopolitical front, we're largely captive to the changing balance of power in the world. The government has an ambitious agenda to see an 'Asian Community' in place by 2020, although what sort of shape this might take remains vague. Creative diplomacy like this is probably as much as Australia can hope to do to smooth the shifting balance of power. We have to be realistic. The affairs of major powers will ultimately be decided by major powers. We have as much hope of decisively influencing the fate of our region in the twenty-first century as Denmark had of shaping the fate of Europe in the twentieth.

Given Australia's response to heightened fears of terrorism, illegal migration and insecurity in our near region over the past decade, we're already well placed to deal with many of the other challenges that can be anticipated.

Most apparent is the enhanced capacity of our defence force. Since the first deployment to East Timor in 1999, the ability of the Australian Defence Force (ADF) to assist our neighbours with security and in humanitarian crises has grown significantly. Recent acquisitions, such as C-17 Globemaster aircraft and the two massive amphibious vessels now under construction, will further increase our capacity to help. Most importantly, the ongoing build-up of the Australian Army from four infantry battalions in 2000 to a planned eight in 2010 is expanding the scale of possible missions that can be conducted. Consequently, the ADF will soon be better able to render assistance in our immediate region than at any time since World War II. (The ability of the ADF to meet the challenges arising from the shifting balance of power in North Asia is more difficult to assess and beyond the scope of this report.)

Similarly, we're now better able to control our borders than at any time in our history. Improved intelligence, surveillance and coordination and enhanced regional cooperation have been established, and the ADF's ability to assist has been boosted by the acquisition of a new class of more capable patrol vessels. Should it become necessary to ramp up our border protection to meet a surge in unauthorised arrivals or other activities that threaten our security, we have a sophisticated and solid base to build on.

Within Australia, governments have long taken steps to maintain social cohesion. The Department of Immigration and Citizenship spends around $450 million each year on a range of initiatives to nurture a 'society which values Australian citizenship and social cohesion, and enables migrants and refugees to participate equitably'. When such initiatives are coupled with the traditional fairness and tolerance of the Australian community, we can be optimistic about the future.

In those rare instances where conflicted allegiances prompt people to contemplate politically motivated violence, the extensive domestic security and counter-terrorism infrastructure developed since 2001 (at a cost of an extra $1.2 billion a year) is ready to respond. In addition, laws have been rewritten to make it easier for authorities to deal with those accused of terrorism-related offences, albeit at the cost of giving authorities greater power at the expense of the individual and some dubious outcomes in practice.

Notwithstanding the broadly favourable situation and our preparedness to deal with many demographically linked security challenges, there's more that can be done. Two recommendations are offered below.

Recommendation 1: Make family planning a priority for Australian aid.

It isn't a law of nature that a country's population increases on the way to prosperity. With good policies and active intervention, there's no physical reason why the birth rate can't be lowered more quickly as prosperity takes hold. For countries with scarce resources, constraining population growth rates delivers both a humanitarian and security gain.

Of the $3.7 billion slated for foreign aid in 2008–09, Australia spent only $26 million on reproductive health and another $130 million on the related area of HIV/AIDS prevention. All up, less than 5% of Australian overseas assistance was directed to areas related to family planning. A greater investment would accelerate the onset of prosperity in developing countries and lessen the long-term need for aid.

The goal of Australia's international aid program is 'to assist developing countries [to] reduce poverty and achieve sustainable development, in line with Australia's national interest'. Containing population growth in developing countries—whether in Africa or the Pacific—would directly alleviate poverty and serve our national interest by reducing the likelihood of instability in the developing world.

And, while all forms of foreign aid bring some benefits to the recipients, assistance with family planning has the merit of being cost-effective. In countries with limited economic prospects, the cost of helping people to control their own fertility through education and improved health services is a fraction of what would be needed to provide for their offspring through a life of growing scarcity.

Recommendation 2: Redouble our efforts to assist the immediate region.

In a world where economic development and demographic trends are generally good, our immediate region is at risk of being left behind. Unless effective steps are taken, demographic trends are set to worsen the limited economic capacities and fragile governance of Pacific island countries and East Timor.

In the absence of stronger and more determined action, the future in many parts of our immediate region is bleak. Australia should expand its program of engagement to assist our neighbours to build economic capacity, promote trade, strengthen governance and bolster security. This is more than a compelling humanitarian issue: Australia will never be secure with insecurity on its doorstep.

Notes and selected bibliography

Hyperlinks to almost all of the sources below can be found in the PDF of the publication on ASPI's website. Accordingly, abbreviated references have been provided for web-based sources.

General

For most purposes, the UN Population Database (UNPD 2006) provides conveniently accessible historical demographic data and projections for countries and regions. However, the US Census Bureau (US Census 2008) maintains an international population database that more readily produces country lists than its UN competitor. For historical data prior to 1950, it's necessary to go to national sources. For Australia, Japan and the UK, these are ABS (2008a), HSJ (2009) and AHDS (2009), respectively.

General discussions of the strategic future, including the impact of demographics include Economist (2008), Treverton (2005), NIC (2008) and Sachs (2008).

Chapter 1

A readable introduction to the work of Malthus and the factors behind the Industrial Revolution is contained in a book review by Robert Solow (Solow, 2007). Malthus' original essay Malthus (1798) is worth a quick look, if only to enjoy the language. The concept of demographic transition is well explained in RAND (2000), and the implications of population growth on economic development are explored in RAND (2003). The high-fertility/mortality and low-fertility/mortality population asymptotes in Figure 2 are oversimplifications; population dynamics all but excludes a static population, so even in the absence of external factors (like war, famine or medical advances) the size of the population will fluctuate around some average level as its age structure evolves.

General discussions of the nexus between demographics and security can be found in Nichiporuk (2001), NFIB (2001), Goldstone (2002), Cincotta (2003), ECSP (2005), CSIS (2008), FIB (2001), Howe (2009) and Leahy (2007).

Chapter 2

Concerns about the impact of continued population growth emerged in the late 1960s and 1970s. Two particularly pessimistic books were *The population bomb* (Ehrlich 1968) and *The limits to growth* (Meadows 1972). The analysis prepared for the Ford Administration (NSSM 1974), sometimes known as the *Kissinger Report*, took a more measured approach.

The UN Development Programme reports regularly on international development through its Human Development Reports. The latest edition was released in 2008, along with a statistical update in the same year (UNDP 2008). In parallel, the World Bank measures and reports on international development. The World Bank website contains a range of explanatory information, statistical data and country assessments (World Bank 2009). The World Bank's annual *Global economic prospects* (GEP 2008) contains projections for poverty reduction in the developing world by region to 2015.

Data on international agricultural production is compiled by the US Department of Agriculture's Foreign Agricultural Service (USDA 2008); the data used in this report is for 2007–08. The nutritional content of grains was taken from an Australian grains industry promotion site, *gograins.com.au (Gograins 2009)*.

The UN World Food Programme produces a range of analyses, including the annual *World hunger series* that examines the overall situation and a particular focus each year. The latest edition deals with hunger and health (UNWFP 2007). Statistics on the impact of undernutrition on children can be found in the *2007 World health statistics* prepared by the WHO (UNWHO 2007). An annual snapshot of food security, *World food insecurity*, is produced by the Food and Agriculture Organization of the UN; the latest report is from 2008 (UNFAO 2008) and deals with the impact of rising food costs in that year. In 2002, the FAO produced *World agriculture 2015/30* (UNFAO 2002), which examined the prospects for world agricultural production and food security to 2030. Note that undernourishment is a broader concept of nutritional fulfilment than calorie intake; it takes into account factors like trace elements and vitamins.

The *OECD factbook* (OECD 2008) contains a wealth of economic, environmental and social statistics for developed countries, including foreign aid payments.

Detailed projections of future energy consumption are contained in the annual *International energy outlook* (EIA 2008) produced by the US Energy Information Administration. Corresponding data on nuclear fuel can be found in a study by Haruo Maeda for the World Nuclear Association (Maeda 2005). Estimates of proven and unproven fuel reserves can be found in Wood (2000), Colorado (2002), Wood (2004) and page 34 of EIA (2008). The EIA projections for regional economic growth to 2030 appear in Appendixes A, B and C of EIA (2008).

The most recent report from the Intergovernmental Panel on Climate Change was released in 2007 (IPCC 2007) . Detailed estimates of the economic cost of climate change can be found in the 2006 Stern Report (Stern 2006). Specific predictions for Australia can be found in Pearman (2008) and Garnaut (2008). A useful analysis of the methodology used in the Stern Review was produced by the Australian Productivity Commission in 2008 (PC 2008). A particularly clear analysis of the challenge of global warming is by Freeman Dyson (Dyson 2008).

The question of whether the maturing of the developing world will lead to peace or conflict is discussed in Howe (2008).

Chapter 3

The back-of-the-envelope analysis of how long it might take for China to reach parity with the US makes the best use it can of the available data. The statistics for Japan and Australia (and China) can be found in Maddison (2009) in purchasing power parity (PPP) terms. For the purposes of this report, PPP is a better measure because it avoids the effect of the Japanese yen appreciating from US$1 = ¥360 in 1949 to US$1= ¥99 in 1995. This report uses a market exchange rate for Chinese GDP per capita because that rate yields a much more conservative figure than PPP for the required growth to match the US. Specifically, the International Monetary Fund (IMF 2008) reported US GDP per capita as $47,025 and Chinese GDP per capita as $5,943 using a PPP comparison for 2008. At market exchange rates, the Chinese GDP per capita figure falls to $3,180. Using a PPP value of Chinese GDP would require only a twofold increase in Chinese GDP to reach parity. Note that China's GDP per capita grew fourfold between 1984 and 2006, and 14-fold between 1950 and 2006.

This report's principal source of long-term economic projections is a report produced by Goldman Sachs (2003) that looks to 2050. The International Energy Agency (EIA 2008) produces regional projections out to 2030. An earlier study by the Strategic Assessment Group of the US Central Intelligence Agency projected economic growth for five different scenarios to 2025 (SAG 2001). Detailed modelling of global and Japanese economic growth can be found in McKibbin (2004, 2005a, 2005b).

The impact on Australia of the shifting balance of power has been canvassed many times in ASPI publications, including Trood (2004), Bell (2005), Ayson (2005), Jennings (2005), Terrill (2006), Lyon (2007), Gordon (2007), Zhang (2007), Tow (2008), Lyon (2008a) and Lyon (2008b). The potential for China's rise not to be accomplished peacefully is explored in White (2008) and Kaplan (2005); a contrary view is contained in Kang (2007). For a discussion of the resurgence of Russia from an Australian perspective, see the 2008 Australian Institute of International Affairs Policy Commentary (AIIA 2008).

Chapter 4

Of the large number of reports dealing with demographics and security listed above, the one that best builds an evidence-based argument is by the US think tank Population Action International (Cincotta 2003). Also useful is PAI (2003), which includes statistical evidence of the correlation between fertility and instability for the 1970s, 1980s and 1990s. A more benign view of the relationship between demographics and security can be found in an article by Henrik Urdal in ECSP (2005). The concept of a 'demographic dividend' is explored in McDonald (2007).

The UN population division maintains a World Urbanisation Prospects database (UNPD 2007) with historical and projected data for national and regional urban/rural populations.

This report's source for global health trends is the latest *Global burden of disease* (WHO 2004) from the WHO. The WHO measures the impact of disease in terms of disability-adjusted life years (DALYs), defined as follows: DALY 'extends the concept of potential years of life lost due to premature death to include equivalent years of "healthy" life lost by virtue of being in states of poor health or disability'. Figures quoted for population density come from UNPD (2006), and those for economic growth from EIA (2008).

The National Intelligence Council projection for HIV/AIDS in 2025 comes from NIC (2008). Further information on HIV/AIDS can be found in the *2008 Report on the global AIDS epidemic* UNAIDS (2008) from the Joint UN Programme on HIV/AIDS.

A detailed survey of developing countries facing unfavourable demographic conditions appears in Cincotta (2003), and the same issues are also canvassed in the general articles on security and demographics mentioned above. The situation in maritime Southeast Asia is covered in Nichiporuk (2006), and the situation in Pakistan and Bangladesh in Fair (2005). A very good survey of Asian demographics is provided by Eberstadt (2004). Anthony Cordesman has produced a series of reports on the prospects for stability in the Middle East taking into account demographics (Cordesman 1998, 2001a, 2001b, 2002; Fuller 2003).

The economic data presented in Table 8 comes from the *OECD factbook* OECD (2008) and Casey (2003). Earlier work on the topic appears in Visco (2001) and Dang (2001). A more pessimistic view of the cost of ageing is presented in CSIS (2003); see also CSIS (2002). An analysis of Australia's particular circumstances can be found in the first section of the 2008 ASPI report *Strategic choices: Defending Australia in the 21st century (Thomson 2008)*. The long-term fiscal impact of ageing in Australia is examined in the Treasury's 2007 *Intergenerational report (Treasury 2007)*. The US situation is surveyed in GAO (2008) and CBO (2007).

The impact of ageing on developed countries is explored in the general references mentioned above and specifically in Haas (2007), CSIS (2008), Jackson (2008) and Simon (2008). The quote 'the fighting strength …' actually refers to World War I (Churchill, 1938). The 'small family' argument for developed countries being unwilling to employ armed force is set out in Luttwak (1994).

China's ageing is explored in Jackson (2004) and Heller (2006); the latter work deals with ageing in Asia more broadly, as does Xenos (2002). Retherford (2005) examines the impact of ageing on Japan.

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The security implications of gender selection in India and China are explored in Hudson (2004a, 2004b).

The Emergency Events Database *(EED 2009)* maintained by the Centre for Research on the Epidemiology of Disasters is a useful resource, as is the centre's *Annual disaster statistical review* (EED 2007).

Chapter 5

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Table 9 presents population data from UNPD (2006), Human Development Index data from UNDP (2008), foreign aid and GNI data from the OECD (OECD 2007), and economic growth figures from the World Bank (World Bank 2007).

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Chapter 6

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Acronyms and abbreviations

ADF	Australian Defence Force
AIDS	acquired immune deficiency syndrome
AusAID	Australian Agency for International Development
EIA	Energy Information Administration (United States)
GDP	gross domestic product
GNI	gross national income
FAO	Food and Agriculture Organization of the United Nations
HDI	Human Development Index
HIV	human immunodeficiency virus
OECD	Organisation for Economic Co-operation and Development
PPP	purchasing power parity
UN	United Nations
WHO	World Health Organization

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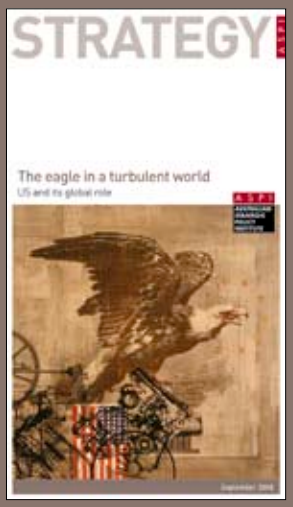

The human tide
An Australian perspective on demographics and security

The economic and demographic transition of countries from poverty to prosperity has been a driving force of history over the past two centuries, and is set to remain so for the remainder of this century. It evolves the relative power of nations and it reshapes countries from within. In the decades ahead, development and demographics will drive two profound changes in Australia's strategic environment.

First, emerging countries like China and India will increasingly become major economic powers. The result will be a steady shift of economic power from the West to the East and from the rich to the poor. In the future, the rich world of which we're a part will increasingly have to negotiate with powerful states representing the interests and aspirations of vast numbers of relatively poorer people.

Second, although economic growth will deliver improved standards of living to most of the world's inhabitants, some vulnerable countries will be left behind as their populations grow. Critically for Australia, East Timor and parts of Melanesia are among those countries with poor prospects in this regard. With fragile and increasingly populous states like this on our doorstep, our humanitarian and strategic interests are unambiguously engaged.

While Australia has limited scope to influence the seismic geopolitical shifts wrought by the rise of new powers, we can help mitigate the risks associated with demographics in developing countries. Two specific recommendations are:

Recommendation 1: Make family planning a priority for Australian aid.

It's not a law of nature that a country's population must increase on the way to prosperity. For countries with scarce resources, constraining population growth rates delivers both a humanitarian and security gain.

Recommendation 2: Redouble our efforts to assist the immediate region.

In the absence of stronger and more determined action, the future in many parts of our immediate region is bleak. Though good progress has been made over the past several years, more needs to be done to guard our strategic and humanitarian interests close to home.

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