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# **Demographic challenges, fiscal sustainability and economic growth**

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# Demographic challenges, fiscal sustainability and economic growth<sup>1</sup>

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## INTRODUCTION

Debates over the economic effects of demographic change have been raging for over 200 years. Since Thomas Malthus hypothesised in 1798 that rapid population growth would stretch the earth's resources beyond the breaking point, leading to mass starvation and death, demographers and economists have argued: first, about whether this would come to pass, and then, about why it did not. More recently, discussions about population size have given way to theories suggesting population age structure and health status are key demographic determinants of economic progress.

In this brief summary of the impacts of population change on macroeconomic performance, we first set out some key facts about the world's population. We discuss the effects of improvements in population health on economic development in general, before focusing more specifically on demographic effects. We then trace the history of how Malthusian pessimism gave way to population "optimism", which argued that rapid population growth could be an economic asset, and then to a "neutralist" view, which posited that population growth neither promoted nor impeded economic growth. Next, we examine how new ideas on the impact of population age structure and population health have challenged traditional thinking. Finally, we look at the policy implications of this finding – in particular, at how economies can reap the benefits of a baby boom and prepare for population ageing.

## BASIC FACTS

Global population, which stood at just over 2 billion in 1950, has risen to 6.5 billion today. The world is gaining new inhabitants at a rate of around 76 million a year. Although this growth is slowing, medium variant projections suggest the world will have 9.1 billion inhabitants by 2050, when growth will be approximately 34 million a year.

Nearly all (95%) population growth currently occurs in developing countries. The population of the world's 50 least-developed countries is expected to more than double by the middle of this century, with several poor countries tripling of their population over

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the period (United Nations Population Division, 2005). By contrast, in the developed world the population is expected to remain steady, at around 1.2 billion, with some wealthy countries seeing population declines.

Just as the size of the world's population is changing, so is its age structure. The number of people over the age of 60 is projected to triple to almost 1.9 billion by 2050. Such ageing is occurring in both developed and developing countries. In the industrialised world, the proportion of people aged 60 or over will increase from 20 to 32 per cent by 2050. In the developing world, it will rise from 8 to 20 per cent. The least-developed countries (LDCs) are expected to continue to have the youngest populations. Eleven LDCs are projected to have populations with median ages below 30 in 2050 (United Nations Population Division, 2005).

Migration is also altering population patterns, although globally there are but 175 million people living in countries other than the one in which they were born. In the next 45 years, the United Nations estimates that an average of 2.2 million individuals will migrate from developing to developed countries. In some countries this is mitigating population decline, but in the majority it is contributing to further growth. According to the United Nations Population Division (2005), the United States will receive by far the highest number of immigrants (1.1 million a year), with China, Mexico, India, the Philippines and Indonesia the main sources of emigrants.

Improvements in health and the related rise in life expectancy are among the most remarkable demographic changes of the past half-century. For the world as a whole, life expectancy increased from 46 years in 1950-1955 to 65 years in 2000-2005. It is projected to rise to 75 years by the middle of this century, reflecting considerable disparities between countries in different income groups (ranging from 66 years among the least-developed countries to 82 years among the wealthy industrialised countries). Historically, most of the longevity gains reflect declines in infant and child mortality due to public health interventions related to water and sanitation, and to medical interventions such as vaccine coverage and the use of antibiotics. By contrast, projected longevity gains – especially in high-income countries – will be increasingly associated with improved survival during the middle and older ages. These improvements are typically associated with improvements in medical technology, life-style changes and income growth.

## **HUMAN HEALTH AND ECONOMIC DEVELOPMENT**

Improved population health was long considered a consequence – but not a cause – of economic growth and poverty reduction. Largely ignored in development economics, population health was not viewed as a cause of income growth or capital accumulation, nor was it considered an aspect of human capital. However, a powerful positive association between income and population health was widely accepted. Populations with higher income per capita tend to have better health, and the prevailing belief was that the causation ran from income to population health.

The idea that there might be a causal link from health to income gained currency in the

late 1990s. There are a number of plausible pathways from health to income. Healthier workforces are more productive, with greater energy, better mental health and less absenteeism. Improved health leads to better education, through enhanced cognitive development in children and increased willingness to invest time in school due to a longer horizon over which to reap the benefits of education. Gains in health increase investment, as individuals save more for longer retirement, and healthier countries attract more foreign direct investment (FDI). Lastly, health improvements – especially among infants and children – often lead to declines in fertility, which can have significant positive economic effects.

Recent studies show that a ten-year gain in life expectancy translates into as much as one additional percentage point of annual growth of income per capita. All else held equal, a healthier country will increase its average income and reduce its poverty rate more rapidly than a less healthy country. In the world economy, per capita income grows between two and three per cent per year; a single percentage point of growth is no small matter.

Population health appears to be a robust and powerful predictor of economic growth, for the reasons noted above – productivity, savings, FDI flows, education and population dynamics. The economic effects of population dynamics have perhaps been the most difficult of these factors to pin down. Although a relationship between demography and economic health has long been known, our understanding of the pathways through which the one affects the other has changed significantly since first hypothesised.

## **ECONOMICS AND DEMOGRAPHIC CHANGE: THE HISTORICAL CONTEXT**

### **The pessimists**

Thomas Malthus argued that the world's resources would be unable to keep pace with population growth. Food production would expand more slowly than population, and many would lose out in the competition for food.

Such thinking endured until the 20th century. In 1968, Paul Ehrlich predicted: "The battle ... is over. In the 1970s hundreds of millions of people are going to starve to death." In the early 1970s, studies by the US National Academy of Sciences (1971) and the United Nations (1973) also predicted negative effects of population growth.

However, mass starvation did not occur, even though world population expanded from about 1 billion in 1800 to over 6 billion by 2000. Economists and demographers therefore began to reject the pessimists' view. Technological and human capital improvements, they showed, had facilitated the more efficient use of resources and enabled food production to be expanded rapidly enough to keep pace with population growth. In the wake of these findings, the pessimistic viewpoint began to yield to a more optimistic perspective.

### **The optimists**

In the last 30 years of the 20th century, per capita incomes rose by two-thirds as global population doubled (Bloom et al, 2003). This prompted some to ask whether, far from being a hindrance to growth, population expansion might in fact assist it.

Simon Kuznets, Julian Simon and Ester Boserup (1967) were the leaders among the population optimists. Kuznets argued that larger societies could take advantage of economies of scale and were better equipped for internal trade. Meanwhile, Simon (1981) showed that the prices of natural resources decline as growing populations, complete with a greater stock of human ingenuity, make the technological improvements necessary to respond to increasing demand. Boserup presented compelling historical evidence of the pressure that population growth puts on societies to create new solutions in the face of resource constraints. The Green Revolution, for example, where new high-yield crops dramatically increased food production in much of the developing world, was in part a response to population growth. Although the optimists did not believe population growth would automatically lead to economic advances, they saw that favourable policies could help translate increases in population into enhanced wealth.

### **The neutralists**

Population neutralism, which became the predominant school of thought in the 1980s and 1990s, took the optimists' observation that the consequences of population growth depended largely on the policy environment a step further.

This view was based on empirical research showing little correlation between the growth rate of income per capita and the rate of population growth. Population growth by itself, in other words, had no effect on economic performance, with other factors such as openness to trade, educational attainment and the quality of institutions determining whether economic progress could keep pace with population expansion. Although fast-growing populations tend to experience slower economic growth, when the above factors are taken into account, the negative impact of population expansion disappears (Bloom et al, 2003).

Population neutralism has had a major impact on international development policy, as some donors used the theory to justify withdrawing support for population programmes. Recently, however, new thinking on the effects of age structure has challenged the status quo.

### **THE IMPORTANCE OF AGE STRUCTURE**

The history of thinking on the effect of population on economies has focused primarily on the overall rate of population growth. Work in the late 1950s by Coale and Hoover pointed to some impact of age structure on economic growth (Coale and Hoover, 1958), but since then it has been largely overlooked. In the past decade, however, interest in age structure has revived. The major demographic changes of the past century – population growth resulting from reduced infant and child mortality – have led some economists to re-examine the channels of influence from demographics to income. These analyses have unearthed significant results.

### **The demographic dividend**

The dominant demographic phenomenon of the 20th century was the rise in global population resulting from the combination of falls in infant and child mortality and continued high fertility rates.

Declines in mortality, which occurred in both developed and developing countries, were largely brought about by health improvements. Nutritional, medical and public-health advances spread from developed to developing countries, with hugely positive effects on death rates. These effects were greatest for the most vulnerable sections of society. They first benefited the young: infant and child mortality plummeted throughout the 20th century as vaccination and antibiotics became widely used to fight childhood diseases. Later, as more people survived into adulthood, health advances helped large numbers of people to live longer lives.

Reductions in infant and child mortality led to burgeoning youth cohorts – often known as a “baby boom” – and increases in the overall population. The historical pattern in much of the world has been for falling mortality rates to be followed after a lag by fertility declines, as parents respond to the improved survival rates of children. The provision of family planning and the increased participation of women in the labour force have also helped to lower fertility rates by reducing unwanted pregnancies and desired family size. Reduced fertility means the “baby boom” cohort is both preceded and followed by smaller age cohorts. Therefore this cohort forms a bulge that gradually works its way up through the age structure.

While this bulge cohort is in infancy and childhood, it places an extra burden on older generations, because young people who need health care and education tend to consume more than they produce (whereas workers produce and save more than they consume). As the bulge cohort reaches working age, it increases a country’s per capita labour supply. With the ratio of workers to dependants higher than in previous and succeeding generations, the baby boomers, less constrained by the resource demands of the young, have the potential to boost economic growth. Bloom and Canning have calculated that increases in the ratio of working-age to total population are positively associated with growth in per capita output (Bloom and Canning, 2004).

This “demographic dividend” played a large role in the success of the East Asian “tiger” economies in the second half of the 20th century. Infant mortality in the region fell from 181 per 1 000 in 1950 to 34 per 1 000 in 2000, and fertility fell from six children per woman to two per woman over the same period. A baby boom was created during the lag between mortality and fertility declines, and from 1965 to 1990 East Asia’s working-age population grew almost four times faster than its non-working-age population (Bloom et al, 2003). It has been estimated that roughly one-third of the region’s economic growth can be attributed to shifts in its age structure (Bloom and Williamson, 1998).

The economic benefits of the demographic dividend operate through several channels. First, a healthier labour force, and one that represents a larger share of total population by

virtue of its concentration in the prime working ages, has greater capacity for economic production. In addition, having fewer children gives working-age women more opportunities to participate in the labour force.

Second, the fertility declines that round off the baby boom mean working parents have fewer children to care for. As well as releasing capital for investment in production, this enables families to concentrate their resources on fewer children, with higher survival probabilities increasing the expected return to investments in children. Each child may therefore receive more and better schooling and health care than if spending on these is shared among a larger number of children. This increase in the human capital embodied in children can have beneficial long-term effects on the next generation's economic prospects. And fourth, longer life expectancy gives people greater incentives to save for longer periods of retirement, thus increasing the funds available for capital accumulation and technological progress.

Capturing the demographic dividend is not inevitable, however. Latin America has had demographic changes similar to (but less dramatic than) those of East Asia, but has not duplicated the latter's economic progress. As we discuss in the final section of this summary, the policy environment in which the baby boom takes place is crucial for converting it into economic growth. Before that, however, we examine the second major demographic trend of recent times – population ageing.

### **Longer lives**

Medical and public-health advances not only affected the young – they also improved health and reduced mortality at other ages, including among the elderly. Life expectancy more than doubled from 30 to 65 years between 1900 and 2000, with people in both developed and developing countries living much longer by the century's end than at its start.

The proportion of the elderly in the total population is rising sharply. The number of people in the world aged 60 or above, which is currently around half the number of 15 to 24-year-olds, is expected to reach 1 billion and overtake the 15-24 age group by 2020 (Bloom and Canning, 2004). The proportion of individuals aged 80 or over, meanwhile, is projected to rise from one per cent to four per cent of the global population by 2050. This process is particularly advanced in industrialised countries, and as the baby boomers move out of the workforce, the proportion of elderly will receive a further boost.

Rising old-age dependency has led to fears of overwhelming pressure on fiscal systems. Many have argued that state-funded pensions and healthcare systems will be unable to cope as the tax revenues from diminishing working-age populations prove insufficient to support burgeoning cohorts of the elderly.

Population ageing, however, is a new phenomenon, making it difficult to gain insights from previous experience. Research that offers a guide to the likely macroeconomic consequences of ageing is scarce. Simple projections based on changes in age structure point to the possibility of downward pressure on income per capita in developed

countries as labour supply per capita declines, but there are several reasons why the effect on welfare may not be as severe as many believe.

First, income per capita is not itself a welfare measure – looking at consumption, health and longevity over the life cycle (a cohort measure of welfare rather than a period measure of output) gives a more optimistic picture. Improvements in health and longevity increase welfare directly, so even if consumption declines as a result of decreased incomes, the net effect of higher life expectancy on welfare is likely to be positive.

Second, the dependency of the elderly is not an inevitable state of affairs. Currently, retirees in developed countries receive a net benefit from government transfers. But in pre-industrial societies, the elderly are net contributors to the young (Lee, 2000), and at the household level, the elderly in the US make transfers to the middle-aged (Bloom and Canning, 2004). Old-age dependency hinges, therefore, to a large extent on the policy environment that is in place.

Third, the simple economic projections that show catastrophic effects of ageing tend to be based on an “accounting” approach, which assumes that age-specific behaviour remains unchanged. This approach, however, ignores the potentially powerful effects of behaviour change. Real savings are required to finance the retirement of the ageing population, whereas the ageing of the baby-boom generation potentially promotes labour shortages, creating upward pressure on wages and downward pressure on the incomes of retirees. In response to these pressures, it is likely that behaviour will adjust, resulting in increased labour force participation, the immigration of workers from developing countries and longer working lives (supported by improved health as well as increased longevity).

Bloom, Canning and Moore (2004) have found that health and longevity improvements tend, in theory, to raise the desired retirement age and reduce savings rates. However, institutional rigidities such as public and private incentives to retire and mandatory retirement ages do not allow people to work as long as they wish, so in practice they are forced to save more while working to pay for longer retirement. Those who are able to extend their working lives are unlikely to experience precipitous and major falls in income, and the increased savings of those who retire early mean that savings rates, too, may remain stable.

## **POLICY IMPLICATIONS**

The changes in age structure brought about by baby booms and ageing place new demands on national and international policy making. Transitions from high mortality and fertility to low mortality and fertility can be beneficial to economies as the large baby boom cohorts enter the workforce and save for retirement. Rising longevity, meanwhile, has perhaps increased the incentives to save for retirement. The realisation of the potential benefits associated with the demographic transition and the mitigation of the negative effects of ageing depend crucially on the policy and institutional environment in which these shifts occur. Although more research is needed to ascertain exactly which

policies would be most appropriate for dealing with demographic change, the following are likely to prove key areas of focus.

### **How to create a baby boom**

The first step in the demographic transition to low mortality and fertility is to improve the health of the young. Expanding vaccination coverage; making available treatments such as antibiotics and oral rehydration therapy; and taking public health measures such as improved sanitation, health education for parents and the provision of bed-nets to protect against malaria are all tools for reducing infant and child mortality.

Once mortality declines, the next step is to reduce fertility. The provision of family planning has been found to have significant effects on fertility (Bongaarts, 1997). Facilitating women's participation in the labour force (by addressing cultural or regulatory barriers or providing childcare) may also persuade parents to aim for smaller family sizes. Fertility rates in Ireland, for example, fell sharply after the legalisation of contraception in 1979. This reduced the dependency burden and helped stimulate rapid growth in the participation rates of the female labour force between 1980 and 2000 (Bloom et al, 2003). In China, too, fertility fell quickly in the 1960s and 1970s. The consequent decline in the dependency burden enabled China to begin collecting a demographic dividend in the 1980s and 1990s.

Once created, the baby-boom cohort needs to be nurtured. Expanding and improving schooling will give the rising numbers of children the skills required to contribute to the economy when they reach working age. East Asia captured its demographic dividend partly because it provided a high-quality education to the baby-boom generation. On the other side of the globe, the introduction of free secondary schooling in Ireland increased school enrolment and prompted the expansion of tertiary education.

The East Asian and Celtic tigers continued to clear the path for the boom generation as it moved into the labour force. East Asia carefully opened up to international trade, thus creating new employment opportunities for its burgeoning working-age population; it did not impose strict labour-market regulations; and it encouraged savings and investment. Ireland also benefited from liberal labour laws as well as from measures to attract the FDI that provided jobs to its workers. Bloom and Canning have found that open economies experience much higher growth impacts from demographic change than the average, and that closed economies will receive no benefit from shifts in age structure (Bloom and Canning, 2004).

The experience of Latin America, which exhibited weak macroeconomic management and restrictive labour laws, seems to indicate that capturing a demographic dividend is not inevitable, even with a favourable age structure. Demography is not destiny – it needs to be combined with policies aimed at maximising the opportunities it provides. As other regions such as South Asia, the Middle East and, in the longer-term, sub-Saharan Africa attempt to take advantage of their own baby booms in the next few decades, the extent to which their policies help to take advantage of age structure may determine whether they follow the path of Latin America or East Asia.

### **Mitigating the effects of ageing**

Once the baby boomers reach the age of 60, policy makers are faced with new challenges. Only in the past few decades has any society had to deal with the effects of a surge in the numbers of elderly. Much more research is needed if we are to accurately predict the extent and consequences of population ageing. Forecasts of age-specific morbidity patterns, for example, will assist in estimating the future labour supply and the demand for health care. Other key research areas include the extent and fiscal impact of behavioural change in response to ageing; the immigration levels needed to compensate for reductions in the labour force; and how workers' and retirees' reliance on company provision of health care and pension benefits will affect firms' competitiveness and increase international outsourcing.

Market responses are likely to mitigate some of the effects of ageing. Reduced labour supply will push up wages, encouraging new entrants to the labour force. Women and the younger elderly, for example, may be attracted into work, and inward migration is also likely to take up some of the slack.

These responses will only be effective, however, if they are not impeded by policy. Restrictive labour laws are one barrier, particularly if they make hiring and firing workers, working part-time or paying market wages difficult. Moreover, many existing social-security systems penalise individuals who wish to work beyond a fixed retirement age through high taxation rates. This may exacerbate labour shortages.

Barriers to immigration also hold down the labour supply. Immigration is a political hot potato in many countries, but the economic incentives to lower the barriers are likely to grow stronger as domestic populations age in developed countries. International outsourcing, which is also controversial today, may also become an increasingly important means of meeting the demand for labour.

In addition to labour market reforms, addressing the financing of retirement will be a key task. Population ageing will require increased savings. This will affect financial markets, rates of return and investment. In order to ensure adequate financing for the retirement needs of the elderly, methods for dealing with systemic risk in financial markets will have to be developed. Healthcare costs, too, are likely to spiral as more people move into old age. Healthcare systems will expand and long-term care for the elderly will grow in importance. These sectoral changes may have effects on economic growth – as non-tradable, labour-intensive sectors that have a low rate of technical progress, healthcare and eldercare may affect the structure of the economy, potentially slowing growth.

Countries which have financial institutions that best channel savings to productive investments, along with labour market institutions and policies that best facilitate domestic and international supply responses to labour shortages and high wages, will be well-placed to mitigate the adverse consequences of population ageing. The economic impacts of ageing, like those of a baby boom, are far from immutable. Responsive policy will help societies make the best of both processes.



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