Ageing and its Economic Implications
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Acronyms

APEC  Asia-Pacific Economic Cooperation
NTA  National Transfer Accounts (project)
OECD  Organisation for Economic Cooperation
UEPS  (Chinese) Urban Employee Pension Scheme
LFPR  labour force participation rate

Country abbreviations (ISO Alpha-3 code)

AUS  Australia
BEL  Belgium
BRN  Brunei Darussalam
CAN  Canada
CHE  Switzerland
CHN  China
COL  Columbia
CZE  Czech Republic
DEU  Germany
DNK  Denmark
ESP  Spain
EST  Estonia
FIN  Finland
FRA  France
GBR  United Kingdom
GRC  Greece
HKG  Hong Kong, China
HUN  Hungary
IDN  Indonesia
IRL  Ireland
ISL  Iceland
ISR  Israel
ITA  Italy
JPN  Japan
KOR  Republic of Korea
LVA  Latvia
LUX  Luxembourg
MAC  Macao, China
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I. Introduction

Population ageing is a global phenomenon with significant impacts on sustainable development. While many countries in East and South-East Asia have benefitted from the demographic dividend, this window of opportunity is already closed or currently closing in many other countries in the Asia-Pacific region. There is some concern that population ageing can increase income inequality, while inequalities of opportunity may stifle economic growth and exacerbate poverty, in particular among older persons. In addition, when populations age, public and private health expenditures may increase, which can challenge many Governments.

Population ageing is a positive outcome of economic and social development. However, it will require new economic and social policies to adjust to these aforementioned challenges if countries are to achieve the Sustainable Development Goals of the 2030 Agenda for Sustainable Development. The national experience of this unprecedented demographic phenomenon varies widely among countries in Asia and the Pacific. Moreover, while countries around the world are experiencing different rates of population ageing, at different stages of economic development, nowhere, on average, is population ageing so rapid as in the Asian and Pacific region. It is estimated that countries such as China, Republic of Korea, Singapore, Thailand and Viet Nam will move from “ageing” to “aged” societies within the next 18 to 20 years.

Across the Asia-Pacific region, demographic and economic profiles are diverse, as is the speed of demographic change. Some countries are emerging economies while others are middle income countries or highly developed countries. Some countries have the social infrastructure to adequately address the demographic transition, while others lack the resources and know-how.

The purpose of this policy paper is twofold. First, it provides a cross-country analysis of the economic impacts of and necessary responses to population ageing in the region. Second, it presents possible policy interventions to address population ageing and their scale of impact.

The paper provides a systematic and quantitative analysis of the economic implications of the demographic transition in Asia and the Pacific, focussing on selected countries and areas in East and North-East Asia, as well as South-East Asia. It makes use of a simple yet powerful analytical device to allow the decomposition of impacts on economic growth and fiscal spending into those associated with demographic change, those that flow from transitions in labour force participation, and those driven by changes in productivity. The approach is supported by analysing the impact of population ageing on government expenditure and the implied affordability of such expenditure given an expansion of the welfare system, demographic change and alternative growth scenarios. While abstracting from many of its dynamics, the analysis provides a consistent basis for comparing the impacts of population ageing.

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1 Societies with a percentage of the population aged 65 or older over 7 per cent and less than 14 per cent are defined as “ageing”, while those with a population aged 65 years or over of over 14 per cent are defined as “aged”.
ageing in different countries and areas, and the relative efficacy of policy responses to accommodate demographic change. It also presents simulations on the impacts of population ageing on economic growth and fiscal sustainability, building on earlier work which focuses on economics of the Asia-Pacific Economic Cooperation Forum.2

The paper focuses on six countries: two are high-income (Japan and the Republic of Korea) and already demographically older; two are upper-middle-income economies (China and Thailand), which are ageing fast; and two are lower-middle-income economies (Indonesia and the Philippines), which are ageing but at a considerably slower rate.

Section 2 presents an overview of the modelling approach. Section 3 covers the economic growth decomposition and projections. Section 4 provides spending simulations. Sections 5, 6, and 7 discuss each of the abovementioned contributors to growth and spending outcomes. Section 8 concludes by summarizing the findings and policy responses.

II. The modelling approaches

The paper seeks to model how population ageing affects economic growth, under the assumption that labour force participation does not change over time. Economic growth is modelled by way of a supply-side, gross domestic product (GDP) accounting framework which decomposes the contribution of population, labour force participation and productivity (the 3Ps) to economic growth.

Aggregate domestic economic activity can be decomposed into the population available for work (the labour force participation rate – LFPR), the proportion of the population that is employed and the average level of productivity of workers. This approach lends itself to long-term modelling of the aggregate supply-side of GDP, not taking into account short-term cyclical variations.3 The method is summarized in the following simplified GDP per capita formula for a given year.

\[
\text{GDP per capita} = \frac{\text{Population by age} \times \text{Labour force participation rate by age} \times (1 - \text{Unemployment rate by age}) \times \text{GDP per worker}}{\text{Total population}}
\]

Multiplying the population by the LFPR results in the number of people participating in the labour force. Then, multiplying the number of people participating in the labour force by the employment rate (which is 1 minus the unemployment rate) results in the number of people employed. To obtain GDP, the number of people employed are multiplied by the GDP the average worker yields. GDP is then divided by the total population to obtain GDP per capita.


3 In many advanced economies (including Australia, Canada, Japan, the Republic of Korea, New Zealand, and the United States) such modelling has become a common part of the long-term budgeting and policy development processes (see OECD 2014 for a summary). Such reports primarily make use of GDP estimates as the denominator for spending projections, thereby evaluating the long-term sustainability of government policies.
This formula tracks the composition of economic growth between 1990 and 2050, the period used in further analysis. It is also illustrated in figure 1.

Figure 1. Illustration of the economic growth accounting model (Viet Nam 2015)

The data applied in these calculations related to (1) population by 5-year-age-group and sex are taken from the United Nations (2017); (2) labour force participation data by 5-year-age-group and sex come from the International Labour Organization (no date); (3) unemployment by age (ages 15-24, 25+) and sex and (4) productivity (GDP per worker, calculated as a residual based on historic GDP estimates from the International Monetary Fund, 2016, and assumed to converge for the projection). The method allows for the decomposition of economic growth by each of these factors and the projection of economic growth by making assumptions about how each component might change over time. Public spending by each age group is then incorporated. This shows how spending patterns differ by country and how different scenarios affect aggregate spending levels, as discussed in section 4.

III. Economic growth and its decomposition in the study countries

The modelling results show that population ageing could slow down economic growth in the eleven largest economies in East Asia. In these countries, the (unweighted) average annual GDP growth is expected to halve from 5.2 per cent between 1990 and 2015, to 2.2 per cent between 2015 and 2050. These results assume that the population age structure changes according to projections by the United Nations while holding steady the current levels of age-sex-specific labour force participation.

Those economies that are projected to grow fastest, with rates of about 4 per cent or above, include Indonesia and the Philippines. The latter is expected to be the only economy to grow faster than the past. Economic growth for China would be expected to grow at a modest 3.3 per cent per annum. In absolute terms, it would mean that the economies of China and the Philippines in 2050 would be, respectively, about three and five times larger in real terms than...
today. At the other end of the scale, the economy of Japan is projected to grow at below 0.5 per cent per annum.

As shown in figure 2, growth in per capita GDP is also expected to slow down, except in the Philippines. The unweighted average growth of GDP per capita of the countries and areas under study is expected to halve, from a historic 4 to a future 2 per cent per annum.

**Figure 2 Decomposition of past and future (projected) growth in GDP per capita into the components of population, (labour force) participation, unemployment and productivity, 1990-2015 and 2015-2050 (percentage)**

Decomposing historic and projected growth of GDP per capita shows that labour productivity was the main driver of GDP per capita growth, particularly in China, being responsible for over 90 per cent of total growth over the last 25 years. The productivity increase in China was ten times faster than in Japan. In the future, productivity growth is expected to slow down, but it will remain the most important source of GDP per capita growth. For example, upper-middle-income economies such as China and Thailand will likely converge by 2050 to a level of productivity growth representative of the technological frontier seen in advanced economies. By contrast, Indonesia, the Philippines and Viet Nam are less advanced technologically and therefore projected to benefit from higher productivity growth for a longer time (section 7).

Demographic changes also affect per capita GDP growth. Between 1990 and 2015, changes in the population size and the distribution of the population by age were responsible for about one quarter of aggregate GDP growth in the Republic of Korea and Hong Kong, China, one-third in Viet Nam and Thailand, half in Malaysia, and almost two thirds in the Philippines.
Large shares of younger workers vis-à-vis stagnant or declining shares of non-working persons (namely, older persons and children), increased average levels of production per person across Asia and the Pacific in the past. This is sometimes referred to as the ‘demographic dividend’ or the demographic growth potential (Bloom and Williamson, 1998; Asian Development Bank, 2011; Lee and Mason, 2011; and Golley and Tyers, 2012).

There is some concern that in the future, the ‘demographic dividend’ may give way to a ‘demographic deficit’ as shares of older persons increase. As seen in figure 2, this is most apparent for China; Hong Kong, China; and Singapore. Only Indonesia and the Philippines can expect a positive contribution of the population age structure to GDP per capita growth.

Changes in LFPRs by age have had a smaller effect on GDP and GDP per capita. Notably, China and Thailand saw declines in participation rates, particularly by university-age and pension-age populations (sections 7.2 and 6.2). For example, China’s gross enrolment rate for tertiary education increased from 3 to 43 per cent between 1990 and 2015 (World Bank, 2020). However, such participation effects mask changes by sex, which are further discussed in section 6.3.

Combining changes in population with existing LFPRs suggests that by 2050, declines in labour force size are expected in China; Hong Kong, China; Japan; the Republic of Korea; and Thailand. For some countries, including Indonesia, Malaysia, the Philippines and Viet Nam, changes in the population age structure are expected to contribute positively to total economic growth but less in the future than the past.

IV. Fiscal impacts of population ageing

A. Spending by age

As a next analytical step, the fiscal impacts of population ageing are discussed. This requires appreciation of how spending differs by age, available from the National Transfer Accounts (NTA) project. NTA covers over 40 countries, including many in the Asia-Pacific region (Lee and Mason 2011).

The NTA data for public transfers per person, at each age and in each year, are inflated in real terms to 2015, and then pegged to GDP per capita and adjusted to reflect the likely future evolution of age-based spending profiles. Such profiles are then weighted by the expected population at each age to obtain total spending levels. These are in turn divided by the size of the economy, as projected via the methodology described in the previous section but making use of alternative scenarios. This is done for each of the six target countries in this paper.

In the following, public spending per person in different age groups is analysed. Figure 3 shows this as a proportion of GDP per capita in each of the countries. Spending comprises all cash and in-kind transfers (including via pay-as-you-go social security schemes) from general

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1 Some of these results are consistent with the scale of the demographic dividend described in the relevant literature.
government sources (central, state and local), which are then attributed to individuals across the age distribution. This is shown across four spending programmes identified by purpose: education, health, pensions, other cash and other in-kind transfers. Since cash transfers are included, the amounts will be higher than general government final consumption expenditure. Nevertheless, since items such as investment are excluded, spending will be less than that reported under total general government expenditure in the System of National Accounts.\footnote{Public transfers include: (1) “secondary income payable - social assistance benefits in cash to residents”; (2) “secondary income payable - other current transfers - other sectors”; and (3) government “final consumption expenditure”.
}

The details of how such spending estimates are constructed can be found in United Nations (2013). Often, these spending estimates depend on administrative or household data, which offer information on different transfers by the characteristics of the recipients. Some transfers, such as other income in-kind (for example, spending on public transport) do not accrue to particular individuals but are assumed to be divided equally across the population. Although the data are taken from different years and are dated in some cases, they do allow some conclusions on spending trends by stage in the demographic transition of different countries.

Figure 3 reveals several patterns. Education spending is targeted at younger age groups. It is higher as a proportion of GDP per capita in more developed countries, such as Japan and the Republic of Korea, than in less developed countries. But relative to other spending programmes per person, educational transfers are most important in emerging economies such as Indonesia, the Philippines and Thailand. These countries are all intending to invest in their more youthful but less educated populations.

Advanced economies that are at a later stage in the demographic transition reveal spending patterns that are increasingly generous with age. They tend to set up health and welfare systems that become more universal and cater to an expanding older population (Chomik 2013a, 2013b; and Chomik and Piggott 2015). With the demographic transition advancing, this generosity is often reversed, as observed in countries like Japan and the Republic of Korea. For example, the Government in the Republic of Korea set up a publicly run earnings replacement pension in the 1980s only to cut benefits once the challenges of population ageing set in. Pension replacement rates were cut from 70 to 40 per cent in two sets of reforms (Park, 2012). Yet, while cutting the earnings replacement pension pillar, the country has expanded the safety net pillar, nearly doubling the minimum pension in 2014. Japan has made similar reforms to its pension system (Whitehouse et al., 2009).

Most emerging economies have been expanding existing or introducing new public spending programmes affecting older persons that have evolved from those shown in figure 3. Thus, if more recent data were available, the patterns would have moved towards those of Japan and the Republic of Korea. For example, the Philippines introduced pension schemes for private sector workers in the 1950s. In figure 3, the effects of this programme can be identified among ‘other cash’ payments (the attribution as cash payment instead of as a pension is an artefact of the estimation method, Salas and Racelis, 2008). More recently, the Philippine Government...
increased its old-age pension payments for adequacy reasons and to stimulate the economy, with another rise scheduled in the next five years (SSA, 2017).

Figure 3. Public spending per capita (percentage of GDP per capita), by age and expenditure category, selected countries and most recent years with data availability

Source: Lee and Mason (2011b).

Thailand has introduced universal health insurance and a social pension. Current expenditure on the public element of Thailand’s retirement income system was equivalent to about 2.2 per cent of GDP (International Labour Organization, 2017). As populations age, the balance between contributions and payments may make systems fiscally unsustainable. Figure 3 shows that already in 2002, China’s age spending profile was beginning to show increasing generosity toward older persons. But since then, it has seen the largest expansion of the pension and health system of any country – between 2002 and 2012, it enrolled 1.2 billion people into its health insurance system, including expanding coverage for rural citizens from near-zero to almost universal pension and health-care coverage (Chomik, 2013b).
Overall, emerging economies in Asia and the Pacific are moving towards an age-spending profile that resembles an economically and demographically advanced country such as Japan (which manifests a level of spending comparable to many European countries).

B. Modelling future spending: How social development and population change can influence fiscal expenditure

There is concern that population ageing will lead to higher spending on social protection, particularly pensions and health expenditure, which could make public spending unaffordable. The following projects how fiscal spending would develop in the six target countries by 2050 if population ageing and welfare spending were similar to current levels in Japan.

The calculations are done according to the following steps:

1. Spending profiles per person in figure 3 are uprated by GDP per capita from the year in which they were estimated forward to 2015 (and backward to 1990);

2. Between 2015 and 2050 the age spending profile is gradually transitioned to correspond to that seen in Japan to simulate an expected expansion of the welfare system;

3. The age spending profile per person is weighted by the estimated historic and projected population for each age group;

4. The aggregate spending levels in each year are divided by GDP, as projected in section.

Aside from moving towards the welfare spending level of Japan, this assumes no improvement in efficiency of spending.

The first panel of figure 4 shows results in aggregate terms across the six countries. The lower panels present spending for each country by programme. Several patterns are apparent.

Japan’s more generous spending on older persons and an already older population means that spending on public transfers, as defined in the NTA methodology, take up a greater share of GDP – around 32 per cent in 2004. The projection for Japan shows how spending is expected to increase to 42 per cent of GDP by 2050 because of population ageing, assuming a given level of economic growth and spending patterns by age that remain constant with GDP per capita.

At the other end of the scale are lower-middle-income countries, the Philippines and Indonesia, which are ageing at a slower rate (section 5). Their population-age structure, economic growth, and development of welfare policies could see spending rise from below 10 per cent of GDP in the 2000s to 28-29 per cent by 2050. As upper-middle income countries, China and Thailand are comparable to the Philippines and Indonesia now, but their

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6 As discussed in section 4.1, spending profiles would have evolved since the NTA year, which would affect the starting point in 2015 for some countries. This is a limitation of the modelling approach that will affect some countries (e.g., the Philippines with data from 1999 and China with data from 2002) more than others (the Republic of Korea with data from 2012). While the starting point is slightly affected, the end point is not.

7 A cubic spline calculation ensures that the transition is smooth.
demographic development is expected to result in sharp increases to public spending, reaching about 37-38 per cent of GDP by 2050. The Republic of Korea, on the other hand, currently has a level of spending that is halfway between these middle-income countries and Japan’s; but by 2050, the country is projected to spend around 40 per cent of GDP on all cash and in-kind public transfers.

Projected trends in spending by programme are also instructive (bottom panels of figure 4). Overall, advanced and middle-income countries with fast levels of population ageing see greater spending driven by health and pension programmes. For example, the methodology suggests that China’s existing levels of spending on education and health are similar, at just over 1 per cent of GDP each. By 2050, education spending is projected to triple to 3.5 per cent, while spending on health is projected to be almost three times that level at 9.1 per cent of GDP. Even if current levels are under-estimates based on older data, the direction of change is grounded on reasonable assumptions. Lower-income countries see more modest, but still considerable increases in health and pensions between 4.7 and 6.6 per cent of GDP. However, at the same time they are expected to see continued pressure on education budgets. Furthermore, to match the profiles seen in advanced economies like Japan, lower-income but fast developing countries, such as Indonesia and the Philippines, are likely to also see increases in public spending (regardless of population-age structure) on other public services such as public transport and defence, categorized here as ‘other income in-kind’.

The results show that if countries increase spending on health and social protection, while not adopting other policies to adapt to population ageing, spending on pensions and health together would amount to about one quarter of GDP in China, Japan, Republic of Korea and Thailand. Since this could make spending unsustainable, countries would have to adopt policies to accelerate or maintain economic growth with ageing populations. In what follows, the effect of different scenarios that affect each of the three sources of economic growth described in section 3 are examined: population, (labour force) participation and productivity. First, the effects of population size and age structure are discussed: that is, no migration and increasing fertility rates. What follows is an analysis of how the spending envelopes calculated in the base projection would be reduced as a proportion of GDP if labour force participation or productivity growth were to rise, respectively.

The modelling does not directly look at methods to control spending per se but considers how increasing the GDP denominator can reduce the relative size of spending. This is relevant since fiscal imbalances in Asia and the Pacific have generally not been the result of budget profligacy but rather related to economic growth or lack thereof (for instance during the Asian financial crisis and the global financial crisis). To consider population ageing and welfare system development, the approach necessarily abstracts from short-term fluctuations noted in other research (International Monetary Fund, 2013). It should also be noted that the modelling results show spending as a proportion of GDP, which takes account of revenue sources indirectly (box 1).
Figure 4. Fiscal spending projection: effects of changes in population age structure and development in age-spending profile (fiscal spending as a percentage of GDP, 1990–2050)

Source: Authors’ analysis.
Note: Round marker in first panel shows base year from which age-spending-profile is originally taken. Calculations combine demographic projections with NTA data, which in some cases are dated. This does not affect the end of the projection but may under-estimate recent spending changes. OINK refers to other public in-kind transfers, OCSH refers to other public cash transfers, EDUC refers to education, PENS refers to pensions and HLTH refers to health.
Box 1. Fiscal revenue and changes in the population-age structure

While fiscal spending as a proportion of GDP implicitly demonstrates its level of sustainability, actual sustainability also depends on the revenue side of a government’s budget. So far, countries in East Asia and the Pacific have tended to be low taxing and low spending countries (Figure B1). This may change with increased demand for public support, as has occurred in Japan in recent years.

Changes in the age structure of the population, in particular population ageing, are expected to affect tax revenues in several ways, depending on each country’s circumstances and tax system. For example, a country that relies heavily on labour income taxes may find itself in more difficulty if an ageing population yields less income from earnings and more from assets. Age-based tax-revenue profiles of different East Asian and Pacific countries are shown in figure B2. The figure reveals how some countries, such as Japan, rely to a greater degree on taxes paid by older persons than countries like China, which rely more on the working-age population. A more detailed analysis using age-based tax data could comprise a future research direction. In the meantime, it is worth summarizing some policy principles to bear in mind when considering tax reform to prepare for the demographic transition. These include broadening consumption taxes, considering property taxes (recurrent rather than transition based), broadening the base for personal income taxes but limiting increases in their level (including via social contributions) and reviewing corporate tax exemptions (International Monetary Fund, 2013).

Source: OECD (2018); Lee and Mason (2011)
V. Population

A. Population ageing in Asia and the Pacific

The Asia-Pacific region as a whole is ageing rapidly. In 1990, Australia, Japan, New Zealand, and the Russian Federation were the only countries with more than 10 per cent of their population aged 65 years or over. For 2020 it is projected that this threshold will also be exceeded by Armenia, China, Georgia, the Republic of Korea, Singapore, Sri Lanka and Thailand (as well as Hong Kong, China and Macao, China). By 2050, even in most young countries, such as India or the Philippines, more than 10 per cent of the population will be in that age group. Also, by then, in countries such as China and Thailand a greater share of their populations will be 65 years or older than Japan has today, where a quarter of the population currently belongs to that age group (United Nations, 2019).

Population ageing driven mainly by declines in fertility, to a lesser extent by declines in mortality and increases in life expectancy and can be moderated by immigration. But fertility, mortality and migration levels and trends vary widely by location and over time, so countries in Asia-Pacific are at different stages of the demographic transition.

Population ageing is generally defined as a growth in the share of older persons in the total population. Other indicators measuring population ageing include dependency and support ratios, changes in population pyramids and increases in the median age of the population. Figure 5, in the left panel, presents the share of older persons (65 years or older) in 2015 and the expected rate of change of this share between 2015 and 2050 for selected countries in Asia and the Pacific, which is an indicator for how much further the country is expected to age. In the right panel, the chart shows the same for the working-age population (aged 15–64).

Countries are identified in four quadrants based on where they are relative to the region’s unweighted average of the percentage point change per annum in the share of the population aged 65 years or over between 2020 and 2050. This analysis is helpful in focusing on form, scale and urgency of policy responses to population ageing. Japan stands out as the region’s only economy that is already old and further ageing slowly (many OECD economies would also fall in this quadrant) – mainly because total fertility levels have already been low for a prolonged period. By contrast, Indonesia and the Philippines are relatively young and ageing more slowly. They should be able to develop sound policy frameworks in preparation for population ageing.
The remaining countries, which are China, Republic of Korea and Thailand, are ageing fast: they are among the fastest ageing societies in the world, with commensurate levels of policy urgency. Some are experiencing rapid population ageing from a more youthful population base, including China and Thailand. The Republic of Korea is already somewhat older but can expect to still see considerable population ageing over the next 35 years.

As seen in figure 5, right panel, China and the Republic of Korea have among the largest proportions of working-age people, but they can expect the fastest drop in that population share. By contrast, the Philippines is yet to see increases to its working-age populations, and Indonesia can expect only small declines by 2050.
B. Drivers of population ageing in Asia and the Pacific

Declines in fertility are the main driver of population ageing. Fertility decline has been widespread in Asia and the Pacific. There are many influences on fertility behaviour: access to contraception, higher wages, urbanization, a reduction in subsistence agriculture, increases in female labour force participation and changes in values and social norms such as parental investment in the education of children, the status and education of women, and the availability of private and public support to allow women to combine work and raising a family.

Whereas in some countries, such as Japan and the Republic of Korea, total fertility is well below the replacement rate of 2.1 children per woman, in others, fertility is still above this rate (Figure 6). For the period 2015–2020, Indonesia and the Philippines are, respectively, estimated to have total fertility rates of 2.3 and 2.6 children per woman.

Japan has the oldest population in the world precisely because fertility declined and stayed low there before other countries or areas experienced similar declines. China; Japan; Hong Kong, China; Singapore; and the Republic of Korea currently have among the lowest fertility rates in the world at between 1.0 to 1.4 children per woman, and well below those seen in other advanced economies.

Over the past century, life expectancy at birth has also increased in most countries across Asia and the Pacific and the world (figure 6). Life expectancy at birth tends to rise with income, better dissemination of modern medicine and pharmaceuticals, improved nutrition and sanitation, and changes in behaviour with respect to smoking and exercise. Improvements in these factors have pushed up life expectancy at birth in Asia and the Pacific.

For example, China’s demographic transition was already imminent in the 1970s when it achieved relatively high levels of good health at what was still a relatively low level of per capita income. Average life expectancy at birth rises from about 44 years in 1950 to more than 76 years at present – levels that developed countries took a century to reach and a change that has been described as the “most rapid sustained increase [in life expectancy at birth] in documented global history” (Eggleston and Fuchs, 2012). People in China now have a life expectancy at birth of only about 1.7 years less than that of people in the United States of America even though per capita income in the United States is six times that of China (as measured in international dollars; United Nations, 2019; and World Bank, 2020).

Figure 6 provides historical trends as well as projections of total fertility and life expectancy at birth. Medium variant fertility projections show that developed countries experience fertility levels well below replacement, while for the high fertility variants, countries converge to rates above replacement. The range of expected variation in life expectancy at birth is striking, between 15 and 20 years. Clearly, one of the great benefits of higher productivity economies is substantially improved length of life.
Migration is another important component of demographic change and it is on the rise in the Asia-Pacific region. Remittances of migrant workers are important for the development of countries of origin, such as Bangladesh, Indonesia, the Philippines and Sri Lanka. Hong Kong, China; Macao, China; Singapore; and Taiwan Province of China have become important destinations of migrant workers. Malaysia and Thailand have also become important destinations, reflecting shortages of migrant labour as a result of demographic change, and also the rising wealth of these countries. The upper panel of figure 7 shows migratory patterns by country of origin and destination within the Asia-Pacific region based on data of international migrant stocks. Importantly, most international migration affecting Asia-Pacific is intraregional in nature. The lower panel shows the importance of intra-regional migration for labour migrants from two important countries of origin of labour migrants, namely Indonesia and the Philippines. Large numbers of people from the Philippines and Indonesia work in other countries or areas of the Asia-Pacific region, including Hong Kong, China, Malaysia and Singapore. Countries in the Western Asia have been more successful in attracting temporary workers from Asia and the Pacific: almost one million Filipinos sought work there in 2016.
Figure 7. Current migration and labour mobility patterns in Asia and the Pacific


Labour migrant outflows (in thousands) from Indonesia and the Philippines to selected destinations in Asia and the Pacific, 2016

Source: ESCAP Labour Migration Outflow database online, available at: https://sitreport.unescapsdd.org/labour-migration-outflow. Data are based on administrative records from countries of origin.

Modelling a scenario with higher fertility

When low fertility is a driver of population ageing, a natural response could be to adopt pro-natalist policies to promote fertility. Increasing fertility would indeed slow down population ageing but may have other costs. Thus, in the following, the impact of increasing fertility on spending patterns is modelled using a scenario with higher fertility levels. The results of the simulation are shown in figure 8. The dashed and plain lines represent the baseline and higher fertility scenario, respectively.

Countries with lower fertility rates see greater modelled declines in government spending on social welfare when fertility increases than countries with higher fertility rates. For example,

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8 For further explanation of the fertility variants used by the United Nations Department of Economic and Social Affairs, Population Division see https://population.un.org/wpp/DefinitionOfProjectionVariants/
Japan’s 2050 total level of public spending declines by 1.2 percentage points from 41.2 to 40.0 per cent of GDP, while Indonesia’s only declines by 0.3 percentage points of GDP, from 29.4 to 29.1 per cent.

The spending programmes driving these changes are visible in the lower panels of figure 8. Education spending is modelled to increase with higher fertility rates across all countries, but the divergence with the base case slows down toward the end of the period. Education budgets in 2050 are projected to be between 0.7 and 0.8 percentage points higher with higher fertility than in the base case scenario. By this time, the additional GDP generated by extra workers in the labour market should reduce the relative cost of pension and health spending. That is, pension spending is projected to be between 0.5 and 1.2 percentage points of GDP lower by 2050, with greater declines among low fertility countries, such as Japan and the Republic of Korea. Indeed, in the base case fertility scenario, expenditures for Indonesia’s pension programme are expected to exceed the expenditures for its education programme by 2050. Yet the reverse is true in the case of higher fertility. In this example, slowing down population ageing has a positive effect on budgets.

In sections 6 and 7 the focus of the paper was on the effect of changes in labour force participation and productivity on the relative size of public spending. However, it is worth drawing an important distinction between those analyses and what is presented in this section. In this section, both the level of spending and economic activity that result from alternative demographic scenarios vary – that is, both the numerator and denominator change. When one focuses on labour force participation and productivity, the analysis keeps constant the budgets derived (the spending numerator) in the base case and participation and productivity alter economic activity (the GDP denominator), which in turn affects the relative size of spending. This demonstrates the affordability of the base case spending projection under alternative scenarios. Before turning to participation and productivity, the paper discusses policy options that can affect demographic change.
Figure 8. Fiscal spending projection: effects of higher fertility on fiscal expenditure as a percentage of GDP compared to the baseline scenario

Figure 8A: Total spending in 2015 (baseline), 2050 (baseline scenario) and 2050 (high fertility scenario) as a percentage of GDP and savings in total fiscal expenditure in percentage points resulting from the higher fertility scenario

Figure 8B: Spending projections: effects of higher fertility on fiscal expenditure as a percentage of GDP fiscal expenditure by country and different spending categories, baseline and high fertility projections

Source: Authors’ analysis.

Note: Calculations combine demographic projections with NTA data, which in some cases are dated. This does not affect the end of the projection but may under-estimate recent spending changes. OINK refers to other public in-kind transfers; OCSH refers to other public cash transfers. Dotted line shows the base projection (see figure 4). EDUC refers to education; PENS refer to pensions; HLTH refers to health.
Box 2. Alternative fiscal expenditure scenarios to 2050 in China

Lu (2016) provided another approach to estimate future fiscal expenditures for China under different fertility scenarios. She used three different fertility rates and assumed an increasing share of the population participating in the formal social security system. In contrast to the projections presented in the present paper, Lu’s projections did not assume an increase in the generosity of different spending programmes so the increases in projected spending were driven only by changes in fertility rates and an increase in social security coverage. The results are presented in the tables below. These indicate that greater pension and health insurance coverage results in more modest increases in spending to those shown above. The results also suggest that fiscal expenditure is expected to be quite similar under very different fertility assumptions.

<table>
<thead>
<tr>
<th>Year</th>
<th>Fertility rate</th>
<th>2030</th>
<th>2050</th>
<th>2030</th>
<th>2050</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education</td>
<td>1.55</td>
<td>2.2</td>
<td>0.9</td>
<td>1.55</td>
<td>2.2</td>
</tr>
<tr>
<td>Pension</td>
<td>4.86</td>
<td>4.72</td>
<td>4.98</td>
<td>6.04</td>
<td>5.49</td>
</tr>
<tr>
<td>Health care</td>
<td>4.26</td>
<td>4.23</td>
<td>4.29</td>
<td>4.86</td>
<td>4.66</td>
</tr>
</tbody>
</table>

Table B2: Net expenditure by programme, 2030 and 2050, by fertility scenario, after deducting social contributions

<table>
<thead>
<tr>
<th>Year</th>
<th>Fertility rate</th>
<th>2030</th>
<th>2050</th>
<th>2030</th>
<th>2050</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education</td>
<td>1.55</td>
<td>2.2</td>
<td>0.9</td>
<td>1.55</td>
<td>2.2</td>
</tr>
<tr>
<td>Pension</td>
<td>0.34</td>
<td>0.33</td>
<td>0.38</td>
<td>2.81</td>
<td>2.34</td>
</tr>
<tr>
<td>Health care</td>
<td>1.83</td>
<td>1.87</td>
<td>1.80</td>
<td>2.98</td>
<td>2.87</td>
</tr>
<tr>
<td>Total</td>
<td>6.52</td>
<td>6.78</td>
<td>6.34</td>
<td>9.52</td>
<td>9.75</td>
</tr>
</tbody>
</table>

Source: Lu (2016).

C. Policy responses: Promoting higher levels of fertility

Some countries have implemented population policies which contain measures to promote increases or decreases in fertility levels. In the 1970s and 1980s, China, Indonesia, the Republic of Korea, the Philippines and Thailand had introduced measures to lower fertility levels (for example, sex education, family planning and low-cost contraception). Now, only the Indonesian and Philippine governments maintain such policies, while China, Japan, the Republic of Korea and Thailand – all with below replacement level fertility – have pro-natalist measures (United Nations, 2018).

For women, higher education and income can mean that marriage and motherhood incur greater opportunity costs (Becker, 1991), particularly if there is cultural pressure to be responsible for housework and children even when working (section 6.3). High private costs of children mean that many women and couples delay childbirth and have fewer children. The empirical evidence on the presence of these opportunity costs and the policies that have an influence are mixed. For example, a cross-country analysis comparing the presence of fertility policies (as surveyed by the United Nations) and their effect on fertility rates
suggested that anti-natalist policies were more effective than pro-natalist ones (Ouedraogo et al., 2018).

Beyond media campaigns that seek to change perceptions, three groups of policies are thought to incentivize childbearing: (1) income support; (2) supporting services; and (3) leave entitlements.

Income support can take the form of cash benefits or tax breaks. Cash benefits alleviate the costs of having children for both working and non-working mothers, while tax breaks can also encourage mothers to go back to work. Some OECD countries spent as much as 2.5 per cent of GDP on such benefits in 2013, including the Czech Republic, Hungary, Ireland and the United Kingdom of Great Britain and Northern Ireland. However, such programmes are less generous in Asia and the Pacific. For example, Japan and the Republic of Korea are in the bottom third of OECD countries in terms of expenditure on such programmes, spending 1.0 and 0.4 per cent of GDP, respectively (OECD, 2018). Other economies in the region have also started implementing such programmes, with generous tax breaks recently made available in Thailand, for example.

Programmes that improve access to childcare and early education services, and reduce the related out-of-pocket costs, are particularly important for working parents. This has an impact on participation rates both when children are receiving care and later, as women re-enter work without eroding their human capital.

Many countries worldwide subsidise childcare via direct cash payments and/or indirectly via subsidies and tax breaks to providers. Strong regulations are also important, such as licensing and training requirements that maintain good quality of childcare at different price points and across various locations. In some cases, direct subsidies are means- and activity-tested (such as those targeted at less well-off parents who work or study). One option is direct provision via public programmes, which can ensure both consistent quality and scale efficiencies. Again, Asia and the Pacific has focused less on public childcare support. For example, over the last few years Japan has increased the capacity of its publicly subsidised day care centres but still faces challenges with regard to long waiting lists (Ministry of Health, Labour and Welfare, 2017). Spending on in-kind services for families in Japan and the Republic of Korea is below the OECD average (OECD, 2018). In many other countries of the region, childcare options are lacking and, where services exist, there are sometimes quality issues. For example, in an international study comparing availability, quality and affordability of pre-school education, China, Indonesia, Malaysia, the Philippines and Thailand ranked among the bottom ten countries analysed (Economist Intelligence Unit, 2012. Also, box 5).

Paid parental leave is another way of subsidising families that have children and legislating flexibility on the part of employers. Such policies take several forms. Some are available to mothers only, both partners or either parent; and they might vary in duration and payment rate. The design of leave entitlements may not only lower the cost of having children but can, depending on their design, affect work incentives (for instance, see box 6 on parental leave in the Republic of Korea). Historically, paid parental leave in Asia and the Pacific was covered
by employers, with some countries now moving toward more public and social security fund provision; this remains limited and fragmented. Some researchers have noted that, in addition to these standard policies, East Asian countries need broad social reform that will change not only financial incentives but also attitudes and social institutions (McDonald, 2011).

D. Policy responses: Facilitating safe, orderly and regular migration

Migration policies in Asia and the Pacific have changed over time (United Nations, 2018). In the 1990s and early 2000s all six of the analysed countries or areas implemented policies to lower immigration. By the late 2000s this changed to maintaining existing levels of migration. More recently some have sought to attract migrants, including China, the Republic of Korea and Thailand. While Japan has policies to maintain immigration at current levels, it has implemented measures to increase skilled migration. Most countries have policies to maintain or not intervene with emigration, except the Republic of Korea which intends to raise it. The most common stated rationale for these policies is to meet labour demands in certain sectors of the economy (Asian Development Institute et al., 2016; and Imai et al., 2014).

While migration decisions are not always influenced by government policies, there are different measures that both sending and receiving countries can take to encourage cross-border mobility. These include offering regularized migration channels, skilled migration programmes, bilateral agreements, and multi-lateral labour mobility frameworks through regional groupings such as ASEAN and APEC (Chomik et al., 2017). Such agreements can, for example, provide for recognition of skills and qualifications or facilitate the portability of social security payments. The Philippines has invested heavily in international agreements and processes that ease the burden on its expatriates, including access to social insurance (Philippine Institute for Development Studies, 2012). Thailand, a destination country, has established a memorandum of understanding with neighbouring countries and an inexpensive registration system with one-stop centres across the country to help with the regularization of migrants in border areas (OECD and International Labour Organization, 2017). Integration of migrant workers into the labour market is also an important policy objective. This includes ensuring awareness of rights, representation in trade unions, as well as monitoring and communication about sector needs with both local employers and recruiters in source countries. Cases of abuse of rights of foreign workers in some countries suggest that host countries need to do much more in terms of enforcing and strengthening laws that protect migrant workers and their families.

VI. Labour force participation

While fiscal stress can result from a larger share of older persons, some of this increase may be offset by greater economic participation of working-age adults (Chomik et al., 2016). So active labour market policies and those related to retirement are important when considering the impact of population ageing. Indeed, LFPRs can potentially be raised for older persons and for women.
A. Modelling higher labour force participation rates

Progress regarding increasing labour force participation would mean larger labour forces and GDP growth, making government spending on social welfare more affordable. The modelling presented in figures 10 and 11 shows the effects of greater labour participation rates in two scenarios: delaying retirement of older persons across both sexes and increasing labour force participation of women across all age groups. Each panel compares the baseline scenario to the modelled scenario of higher labour force participation and calculates the savings in terms of spending by category as a percentage of GDP.

The delayed retirement scenario assumes that each 5-year age group between ages 50 and 64 attains, by 2050, the participation rate of each younger age group in 2015. For example, 60-to-64-year-olds are assumed to have LFPRs of the 55-to-59-year-olds, and so on.

Since higher labour force participation can translate to a stronger economy, it lowers fiscal spending as a proportion of GDP. This is apparent across all six countries in figure 10, with declines in fiscal spending compared to the base case of between 0.5 and 2.0 percentage points. The scenario has less effect among countries with a greater share of people of working age, such as Indonesia and the Philippines, and has more impact among fast ageing countries, where younger cohorts have higher LFPRs, such as China. The basic structure of the modelling does not directly account for changes in pension rights due to longer working histories, though some of this is captured indirectly by moving the country spending profiles to the economically and demographically advanced levels seen in Japan.

It is worth stressing that delaying the retirement of older persons is not expected to reduce labour market prospects for the young. In fact, an economy with fewer dependents and lower taxes is expected to result in greater opportunities for young people (box 3 has a more detailed explanation).

In the second labour force participation scenario, the study increases women’s LFPRs across all ages so that by 2050 these reach levels observed for men in 2015 (men’s rates remain constant). Even if the scenario is not entirely realistic, it is instructive in showing the scale of this economic resource (some of which is already tapped in un-monetized household production).

As shown in the top panel of figure 8, the effect is large, lowering the relative size of spending by between 4.0 and 6.7 percentage points per year. The effect is smaller among countries which have a lower gender employment gap, such as China. Conversely, the effect is greater in countries with a large gap, such as the Republic of Korea. The bottom panels of figures 9 and 10 show that savings are shared across programmes, with the largest absolute declines in pension and health budgets. So, while delaying retirement has a positive effect on most economies, equalizing LFPRs of men and women has the greatest impact, especially for countries with large gender disparities. Such analyses complement other findings. The Asian Development Bank and International Labour Organization (2011) estimated that women’s limited access to employment causes a loss in economic growth to the Asia-Pacific region of around USD 42 billion to 47 billion per annum.
Figure 9. Spending projection: effects of delaying retirement on fiscal expenditure as a percentage of GDP

Figure 9A: Total expenditure as a percentage of GDP in 2015 (baseline) and 2050 (projected) under the baseline scenario and in case of delayed retirement

Figure 9B: Projected expenditure by category in the baseline scenario and with delayed retirement, by country, 1990-2050

Source: Authors’ analysis.

Note: Delaying retirement means each five-year cohort of 50-64-year-olds reaches LFPR of the group five years younger, by 2050. Calculations combine demographic projections with NTA data, which in some cases are dated. This does not affect the end of the projection but may under-estimate recent spending changes. OINK refers to other public in-kind transfers; OCSH refers to other public cash transfers. EDUC refers to education; PENS refers to pensions; HLTH refers to health. Dotted line shows the base projection (see Figure 4).
Figure 10. Spending projection: women’s labour force participation reaching men’s 2015 level by 2050 - impact on fiscal spending as a percentage of GDP

Figure 10A: Total expenditure as a percentage of GDP in 2015 (baseline) and 2050 (projected) under the baseline scenario and simulations when women’s labour force participation in 2050 reaches that of men estimated for 2015

Figure 10B: Projected expenditure by category in the baseline scenario and simulations when women’s labour force participation in 2050 reaches that of men estimated for 2015, by country, 1990-2050

Source: Authors’ analysis.
Note: Calculations combine demographic projections with NTA data, which in some cases are dated. This does not affect the end of the projection but may under-estimate recent spending changes. OINK refers to other public in-kind transfers; OCSH refers to other public cash transfers; PENS refers to pensions; HLTH refers to health. Dotted line shows the base projection (see figure 4).
Box 3. Does later retirement mean fewer jobs for young people?

When policies to raise the retirement age are considered, concerns about the impact on youth employment frequently arise.

Figure B4 illustrates that for a sample comprising a range of advanced and emerging economies, mature age and youth employment rates are strongly positively correlated, the opposite of what would be implied if older workers displaced younger workers.

An international study focusing on developed countries and undertaken by the National Bureau of Economic Research confirmed that there is no evidence that increasing the labor force participation of older persons reduces the job opportunities of young persons. Indeed the evidence suggested that greater labor force participation of older persons is associated with greater youth employment and with reduced youth unemployment. (Gruber and Wise, 2010). Focusing on countries in the OECD, the employment of older and younger workers tended to move together, as indicated in figure B4, rather than in opposite directions. Taken together, during the 1990s and 2000s, these countries saw an increase in employment among the age group 55–64 of about 8 percentage points and nearly 5 percentage points for youth. In fact, the youth unemployment rate fell by 2.6 percentage points. Countries with the largest growth in employment among older persons also saw the greatest rises in youth employment and the largest decrease in youth unemployment. There was no evidence that increasing the employment of older persons would reduce the employment opportunities of youth.

B. Policy responses: Delaying retirement

Increasing mature-age labour force participation requires various policy interventions, addressing both the barriers and incentives to work. These relate to four general areas (Chomik and Piggott, 2012):

1. Own health, health of family members, and caring responsibility;

2. Workplace conditions, such as employer flexibility and adjustments to take account of different capacities;
3. Skills and training of older persons, especially when changing to different tasks;

4. Barriers and incentives created by laws, tax-benefit systems, discrimination and social norms.

Health barriers and pension incentives are among the most important areas of intervention. One’s own health and that of family members requiring care comprise one of the most significant impediments to work. To overcome these barriers, policies must be implemented that target chronic and avoidable degenerative diseases but also address caring costs. Investments in health across the life cycle, in particular interventions related to risk factors, such as smoking and obesity, are seen as the most successful public health interventions (Chomik and Rodgers, 2018).

Pension incentives are another key area. These have been shown to have a strong influence on retirement decisions across advanced economies (Gruber and Wise, 1999). Several Asia-Pacific economies, such as Japan, Republic of Korea and Singapore, saw increases in pension eligibility ages over the past decade. Such rises follow the trends seen in other advanced economies, which had declining pension ages up to the 1990s and increases since then (Chomik and Whitehouse, 2010). Still, across the Asia-Pacific region, pension ages are low, even adjusting for life expectancy at birth (figure 12; also, box 4). Different pension ages by sex are also problematic. Since women live longer on average, earlier retirement often means lower benefits and a higher incidence of poverty for older women.

In numerous countries of the region, pension coverage is low, the benefits are low, or both, and pension schemes differ between urban and rural locations. In many cases, older persons are forced to continue working because they either have no pension or benefits are too small. Moreover, because of old-age discrimination, older persons are more likely to work in the informal sector. Although labour force participation of older persons seems to be relatively high in many Asian countries, it tends to be concentrated in agriculture and thus in rural areas, and most are own-account workers. For example, in Thailand in 2006, the percentage of own-account workers who are 60 years old or over was 63 per cent, which was double the percentage of own-account workers in the total labour force (Fujioka and Thangpet, 2009).

Increasing the retirement age is often a difficult political process. In Malaysia, discussions on increasing retirement age are ongoing, but not receiving political support. There is also resistance from employers concerned about rising costs of health insurance contributions (New Straits Times, 2020). In Indonesia, the new defined benefit (Ketenagakerjaan) pension scheme has built in gradual increases in pension age, from a low of 55 years in the former pension scheme (Jamsostek). The retirement age was raised to 57 years in 2019 and will increase by one year every three further years (Cunha, 2017). In Singapore, the Retirement and Reemployment Act provides a legal framework under which retirees have the right to be

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9 See Chomik (2013a and 2013b), Chomik and Piggott (2015), and Chomik (2016) for overview and analyses of Asia’s pension and healthcare systems in the context of population ageing.

10 https://sso.agc.gov.sg/Act/RRA1993#pr7A-
reemployed if they wish. The Republic of Korea has passed an act of anti-discrimination and employment of older persons.

**Figure 11. Pension ages**

In China, the pension-access age debate has been going on for two decades with no resolution. There are in fact several pension-access ages in China, ranging from 50 years for women employed in the private sector in blue collar occupations, to 55 years for white collar female workers, to 60 years for men, in nearly every pension scheme. But life expectancy at mature ages has increased dramatically in the last two decades, and now, on average, women aged 60 are expected to live for a further 21 years, and men for more than 18 years, compared with 18 and 16 years in 1990. The pension system dependency ratio is also changing rapidly.

Calls to increase the retirement age can be traced back to the late 1990s (West, 1999; and Zuo, 1995). In the 2000s, many commentators, including both academic and international organizations, recommended raising the pension access age, arguing this was a necessary step to address population ageing (Giles et al., 2006; Holzmann, 2000; and Barr and Diamond, 2008). The idea received official support, and from 2009, media reports began to emphasize this as a realistic policy reform. But when a director of the China Human Resources and Social Security Research Institution suggested that the retirement age might be increased to 65 years with phase-in starting in 2009, surveys reported that most people were opposed. In 2010, Shanghai introduced a pilot programme of a flexible retirement age, enabling retirees to choose their retirement age from up to 60 years for women and 65 years for men, with an actuarial adjustment on benefits. This has been maintained but Shanghai remains the only region with such a policy (Dorfman et al, 2013).

In 2013, an official document announced that the government would “consider designing a phase-in policy to raise retirement age”. Yet so far, no detailed plan has been made public.

Source: Authors’ analysis of OECD (2013) and other national sources.
The retirement age is more sensitive to pension system sustainability in a defined benefit structure, which is the major component of the nation’s most important pension plan, the Urban Enterprise Pension System (UEPS). Perhaps this is one reason for the resistance to reform of the retirement age. Discussions around converting the UEPS to a system more aligned to defined contribution are ongoing, and this may eventually be the key to increasing access age.

C. Policy responses: Enabling higher labour force participation of women

As suggested by the modelling shown in this paper, countries need all available talent to maintain economic growth when population ageing is pervasive, and women remain a potential resource of workers. Over the last 25 years, many economies under study have narrowed the labour force participation gap between men and women. China and Thailand are notable exceptions, but these two countries had relatively high starting points. Trends in China and Thailand were related to decreasing participation of young women – because of higher enrolment in education (as noted in section 3). Currently, the highest rates of women’s labour force participation in the countries under study are seen in Viet Nam, with a rate 89 per cent of that of men. The greatest rise over the last 25 years has been in Hong Kong, China, where the rate increased from 60 per cent as a share of men’s participation, to 78 per cent. Changes in labour force participation rates by country are shown in figure 12.

The figure also highlights the u-shaped relationship between GDP and women’s labour participation rates relative to men, first described by Goldin (1995). There is also evidence of such a relationship at the subnational level (box 5). It suggests a shift from a situation where households cannot afford to have women not working to one where enough income is earned that women do not have to work, through to one where the opportunity cost of leisure or household production is too great, and women reenter the labour market. Notably, the figure suggests that the u-shape curve has moved upward – that is, at any given level of GDP, more women are working relative to men than in the past.

Figure 12. Female versus male labour force participation rates, by income, and across countries, 1990 versus 2015

Source: Authors’ analysis of International Labour Organization (no date).
The relationship between fertility and female labour force participation is complex. For example, fertility is generally lower the higher the woman’s income and education, though this pattern has recently reversed in OECD countries. Better education is associated with greater employment opportunities; this can have a large impact on the economy. Based on a simulation for 100 countries, a World Bank analysis (Dollar and Gatti, 1999) found that, increasing secondary education of girls by 1 per cent can result in a growth in annual income per capita of 0.3 per cent.

Policies that make education more accessible are likely to affect women disproportionately; however, the participation impacts are ambiguous. Studies conclude that policies to increase women’s access to higher education are not enough to ensure greater labour force participation (Ganguli et al., 2011; and Pignati, 2016).

Box 5. Female labour force participation declines in China

Between 1990 and 2010, China’s female LFPR declined from 91 to 71 per cent. This was faster than the decline for men, which dropped from 96 to 87 per cent. Both urban and rural female LFPRs have fallen, with urban females seeing greater declines earlier (table B3). This is in line with the U-shape relationship with income seen elsewhere (figure 12).

<table>
<thead>
<tr>
<th>Year</th>
<th>National Female (percentage)</th>
<th>National Male (percentage)</th>
<th>Urban Female (percentage)</th>
<th>Rural Female (percentage)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1990</td>
<td>90.5</td>
<td>96.1</td>
<td>76.3</td>
<td>93.6</td>
</tr>
<tr>
<td>2000</td>
<td>87.0</td>
<td>93.6</td>
<td>63.7</td>
<td>95.0</td>
</tr>
<tr>
<td>2010</td>
<td>71.1</td>
<td>87.2</td>
<td>60.8</td>
<td>82.0</td>
</tr>
</tbody>
</table>

Source: The National Women’s Survey.

The decline of the female LFPR in China is likely to be related to several factors. Tertiary education enrolment for the 18–22 age group increased from 10 per cent in 1990 to 27 per cent in 2010. Taking many women out of the labour market would account for about 4 per cent of the drop in female LFPR in 2010. The other factor is the expansion in social security coverage and a dramatic increase of retired women during that period. Retirees entitled to a formal pension amounted to about 9 million in 1990, but increased to 68 million by 2010, half of them being women who could retire at ages 50–55. This could account for another 4 per cent drop in female LFPR (authors’ calculation based on China Bureau of Statistics data).

Perhaps the most obvious reason for the decline of the female LFPR is the lack of a policy to support childcare. In the 1950s–60s, China had a policy to expand childcare centres in rural and urban areas; however, this policy failed for institutional reasons. In the early 1980s, a policy to provide for childcare services for children aged 0–3 was lacking, with no direct government institutions in charge of early childhood education and childcare. Many state-owned enterprises and public institutions developed their own childcare policies and facilities. After the reforms of state-owned enterprises in the mid-1990s, all social institutions within state-owned enterprises and public institutions were abolished and only limited public childcare centres for children aged 4–6 in urban areas were retained. Private childcare facilities have been developed, but also mainly for children aged 4–6. Caring responsibility for children aged 3 or younger remains with families, and mostly women, with no access to formal support or private sector options. In 2010, the
government published a reform programme in which it confirmed that by 2020 early childhood education enrolment would reach 70 per cent, 80 per cent and 95 per cent, for children aged 3, 4 and 5, respectively (PRC Government, 2010). But it mentions early childhood education policies without detailed plans for childcare. Currently, only about 4 per cent of children aged 0–3 have access to childcare (Sina, 2017). With the ‘two-child’ policy implemented from 2016 onwards, more women would be expected to take care of children if childcare options remain absent.

Such care responsibilities will be compounded by growing pressure to care for older persons. Education reforms might ease the caring demand for preschool children and allow more women to return to the labour force, but challenges remain, including a shortage of care workers and qualified teachers. The human and physical capital investments in childcare as well as establishing regulations will require a concerted policy effort. Without investment in childcare and long-term care policies, female labour force participation is likely to continue to decline in China.

The World Bank (2015) documented legislation impacting women’s economic roles, ranging from differential treatment in property rights, to registering a business and retirement age. It reported that in 100 of the 173 economies reviewed, women faced gender-based job restrictions. For example, the report found that in 18 economies, husbands could legally prevent their wives from working. Further, in many countries, including Indonesia, Malaysia and the Philippines, tax provisions explicitly favoured men. While restrictions on married women working at night or travelling outside the home without a husband’s permission might be enacted to protect them, the impact is still largely to inhibit female labour force participation.

Maternity leave can encourage female labour force participation by allowing women to reconcile the demands of work and family, but can have ambiguous effects (Newton, 2011). At times, maternity leave provisions can increase women’s labour force participation in the long run, allowing women to take maternity leave, sometimes even paid, and then be able to re-join the labour force, once the child is born. However, there is also concern that generous maternity leave can make employers reluctant to hire women in the first place (Iverson and McCall-Rosenbluth, 2010). One solution is ensuring appropriate father-focused parental leave so that maternity leave does not turn into a disadvantage for women (box 5).

Childcare costs are often shown to have a statistically significant effect on labour force participation in different country settings (Gong et al., 2010). In this area, what is required is quality care for young children at affordable prices, with flexibility in hours and care type that is complemented by flexibility in the workplace. In Japan, a new government programme offering free preschool education and childcare was launched in October 2019. For all families with children aged 3–5, and for low-income families with children up to age 2, the use of all preschool education or childcare facilities was planned to be free of charge (The Japan Times, 2019).

Emphasizing and encouraging the role of fathers in parenting can further encourage women’s labour force participation. This is important in the context of many Asian countries, where
'regular' employment usually entails long and inflexible working hours (Kinoshita and Guo, 2015). Policies are being adopted to change this situation (box 6).

To a considerable extent, the differing policies that have been established in countries reflect cultural values and levels of economic development. As shown in table 1, for a limited number of policies, some countries have made more progress than others.

Table 1. Presence of selected policies related to female labour force participation

<table>
<thead>
<tr>
<th>Policy</th>
<th>China</th>
<th>Indonesia</th>
<th>Japan</th>
<th>Philippines</th>
<th>Republic of Korea</th>
<th>Thailand</th>
</tr>
</thead>
<tbody>
<tr>
<td>Childcare payments tax deductible</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>Employers must provide leave to care for sick relatives</td>
<td>N</td>
<td>N</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>N</td>
</tr>
<tr>
<td>Public child allowance to parents</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>Y</td>
</tr>
<tr>
<td>Tax deductions or credits gender-neutral</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>N</td>
<td>N</td>
<td>Y</td>
</tr>
<tr>
<td>Childcare subsidised or publicly provided</td>
<td>Y</td>
<td>N</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
<tr>
<td>Primary education free and compulsory</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
<td>Y</td>
</tr>
</tbody>
</table>

Source: Authors’ analysis of World Bank (2015).

Box 6. Targeting fathers’ leave to help mothers work in the Republic of Korea

Mothers may be the main users of child-related leave, but in advanced economies there is growing debate on leave arrangements that target fathers. These can encourage male unpaid work within the household and decrease employer discrimination toward women who are pregnant or have parental responsibility.

Japan and the Republic of Korea can act as examples to other countries in the region. Public policy in both countries provides for one-year paid leave for both parents as an individual entitlement (OECD, 2018). Politicians in the Republic of Korea have responded to the low female LFPRs by reforming parental leave policies, but the process has taken a long time of trial and error. Maternity leave of 60 days was first introduced in 1953 and recently extended to 90 days. Paternity leave has been available since 2012, with 3–5 days, and parental leave for either parent has been available since 1995.

However, in most cases it is the mothers who have been taking the parental leave, and most non-regular workers do not even have access to such arrangements and will simply withdraw from the labour market. One policy that appears to have been more widely accepted is changing the parental leave payment from a flat rate to earnings-related (40 per cent of the wage). More recent reforms have increased this earnings link to encourage fathers to take parental leave of up to three months at 100 per cent of their ordinary wage up to a ceiling. That is, since men earn more, they are disinclined to take time off to care for children unless those earnings are replaced. Encouraging them to do so means that women have the freedom to retain a greater attachment to the labour market after childbirth (OECD and International Labour Organization, 2017).
VII. Productivity

Productivity represents the final “P” in the 3P framework presented at the outset. It is the residual category not accounted for by labour input and defined as the average amount of output (GDP) per worker. Since the total GDP and the number of workers in each economy in each year since 1990 is known, the levels of productivity and how these have changed over time can be derived. Between 1990 and 2015, the unweighted average productivity growth for the countries studied was 3.6 per cent per annum, with China and the Republic of Korea experiencing the greatest gains. The model predicts that in the future productivity in these countries will converge. The base case assumption is that between 2015 and 2050, the productivity growth of each group of countries (by level of income/industrialization) will eventually fall to the rate experienced by the group at the next higher level of income/industrialization during 1990 to 2015 (Chomik et al., 2017). The implicit assumption, based on economic theory and empirical research, is that lower-income economies have the greatest potential to catch up, but that as they develop, it becomes more difficult to reap additional benefits of technological advancement and overcome development constraints such as urbanization and formalization (Baumol, 1986; and Barro, 1997). Under this base case assumption, the simulations show that annual productivity growth of upper-middle income countries, like China, will decline from 6.8 per cent now to 1.1 per cent by 2050, while the rate for lower-middle income countries like Indonesia will decline from 3.5 per cent now to 2.5 per cent by 2050.

A. Modelling higher levels of productivity growth

Figure 13 presents a scenario in which the modelled productivity growth rate is 1 percentage point higher than in the base case. The impact is dramatic: total budget spending declines by between 7.9 and 12.1 percentage points compared to the base case.

The impact is lower in Indonesia and the Philippines – countries which are further away from the productivity frontier and where productivity growth rates are already substantially high. The impact is greater for countries expected to have low productivity growth over the projected period, such as Japan, which in this scenario sees the effect of population ageing being more than offset by productivity growth. The bottom panels show how these savings are shared, pro-rata, by different programmes. In all cases, the savings build up over time due to the compound nature of productivity growth effects.
Figure 13. Spending projection: effects of higher productivity growth on fiscal spending as a percentage of GDP

Figure 13A: Total expenditure as a percentage of GDP in 2015 (baseline) and 2050 (projected) under the baseline scenario and in of higher productivity growth (baseline plus 1 percentage point annually)

Figure 13B: Projected expenditure by category (as a percentage of GDP) in the baseline scenario and with delayed retirement, by country, 1990-2050

Source: Authors’ analysis. Note: Calculations combine demographic projections with NTA data, which in some cases are dated. This does not affect the end of the projection but may under-estimate recent spending changes. OINK refers to other public in-kind transfers; OCSH refers to other public cash transfers. Dotted line shows the base projection (figure 4). PENS refers to pensions; HLTH refers to health.
B. Policy responses: Investing in human and physical capital

Standard economic theory holds that productivity gains result from investment in human and physical capital, as well as the technology that combines these inputs. These factors are potentially amenable to policy intervention.

Physical capital deepening has a demographic determinant – where, under the right retirement income system conditions, ageing societies accumulate greater amounts of capital which can be invested, and which can result in higher levels of productivity. Contributory pension systems play an important role in this context, providing intergenerational consumption smoothening and increasing savings, and ensuring income security for older persons, thus reducing the risk of falling into poverty.

Another way to attract capital is to create a pro-growth investment environment by enforcing the rule of law and by exposing the economy to greater competition (Nicoletti and Scarpetta, 2003; and Aghion and Howitt, 2005).

As industrial structures transition from less to more productive sectors, the quality of the labour input matters more. In fact, past increases in labour force input from rural Chinese migrants moving into non-agricultural sectors has detracted from productivity growth, because of the low levels of education and experience of these workers (Golley and Wei, 2015). Human capital will be even more important as economies move from a focus on manufacturing to one where services dominate.

Higher human capital, often proxied by the level of education, is associated with higher productivity. Higher human capital also implies a greater ability for the economy to absorb new technologies and physical capital investment.

The relationship between education and labour productivity is shown in figure 14. Education is measured here as the share of the workforce with tertiary qualifications. The figure shows that the Republic of Korea saw the greatest rises in educational attainment. In 1992, 29 per cent of its workforce had a tertiary qualification, but by 2015, this increased to 78 per cent. At the same time, labour force productivity more than doubled to about USD50,000 per worker (in 2010 USD).

In two generations, the Republic of Korea transformed itself to become a leader in educational achievement. As noted by the World Bank (2016a), the country started by focusing on the basics, such as scaling up early reading programmes that were effective. It also publicly supported private education at the secondary school level, a trend that is increasingly visible in low income countries. At the tertiary level, the Republic of Korea was one of the first East Asian countries to implement a contingent loan financing university costs, in which graduates repay loans once their earnings reach a certain level.

Singapore is also cited as a regional success story in education policy. Lessons from Singapore include focusing on building teacher capacity, developing ambitious educational standards
and assessments, and continuous improvement by benchmarking of outcomes and practice (OECD, 2011).

Nevertheless, investment in human capital needs to take place not only before labour market entry, but also over the life cycle. Working with employers to provide ongoing training is particularly important as the population ages and occupational structures evolve.

**Figure 14. Relationship between education and labour productivity across the world, 1992-2017**

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Source: Authors’ analysis of International Labour organization (2018). Note: Underlying data includes 137 countries. Each point is a different year of observation; Lines connect different years of observation for each country. The vertical axis uses a log scale.
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**C. Policy responses: Addressing informality**

Much of the Asian ‘economic miracle’ can be explained by the productivity-enhancing shift of labour from farm to factory. For example, between 1991 and 2015, the share of employment
of China’s non-agricultural sector rose from 45 to 71 per cent (International Labour Organization, 2018).

Yet, in many economies in East Asia and the Pacific, informality even in the non-agricultural sector remains high. China tends to have lower informal employment than poorer economies such as Indonesia, where informal economy employment was estimated to be as high as 80 per cent in 2017 (World Bank, 2018).

Informality is associated with poor productivity outcomes. Research suggests that informal sector firms are often inefficient because they have limited access to financing and technology and are often run by entrepreneurs with limited education (La Porta and Shleifer, 2014).

Educating and empowering entrepreneurs can help in addressing the labour demand side barriers to formalization. Managers are a key driver to formalization, since transitioning to the formal sector is only likely if a firm is run efficiently to make this worthwhile, and well-run formal firms expand and take up a greater share of employment (La Porta and Shleifer 2008, 2014; and Gennaioli et al., 2013).

Another area of policy intervention relates to tax and benefit design, which may affect both labour demand and supply barriers to formalization. If taxes and social contributions are excessively costly, they may discourage workers from formalizing. Innovative approaches that increase the incentive to join social insurance schemes include matched contributions, such as those seen in China (box 7).

**Box 7. Increasing the formal labour force in China**

Pension reforms in China have effectively incentivized workforce formalization and increased the coverage of social security systems.

China has actively expanded its health insurance and pension schemes. For example, one set of schemes target rural and urban informal sector workers, by offering a basic social pension and health benefits based on small, voluntary, matched contributions. These schemes have enrolled hundreds of millions of people and established a culture that encourages formalization. Indeed, the formal-sector Urban Employee Pension Scheme (UEPS) has expanded over the past two decades by offering a generous benefit of about 70 per cent of net the pre-retirement income, which is tied into local wage rates (figure B5).

Over the last two decades, the number of contributing members in the UEPS increased from 10 to 26 per cent of the working age (15–64) population. Considering that retirement age is well below 65 years (section 6.2) and that many people join the workforce well after age 15, the actual coverage could be much higher. The expansion in coverage is associated with economic development, along with generous social policy reforms, urbanization planning, better enforcement, and the improvement of laws. Indeed, provincial GDP per capita is correlated with formalization, as measured by formal pension coverage (figure B6).

There are other contributing factors: Zhejiang province initiated a policy in early 2000 that allowed enterprises to pay much lower contributions for their rural workers into the UEPS system (from a 20 per cent contribution for the social pooling component to 12 per cent,
with lower benefits proportionally). That increased the pool of contributors and shifted some rural, informal sector workers into the formal sector. This is a way to bridge the formal and informal social security systems, which are still fragmented.

Urbanization itself is accompanied by formalization of the labour force. When the zoning of farmland is changed into urban usage, the residents of the land are required to be covered by social insurance (at least pension and health care), which is part-financed by the land transfer profits. This is an important and innovative step to help newly urbanized rural workers join the formal sector.

*Source: Lu, Piggott and Zheng (2020)*
VIII. Concluding recommendations

All countries in the Asia-Pacific region face the common challenges of fiscal sustainability and maintaining growth in the context of population ageing. The extent of these challenges and the exact policy responses differ for the three groups of countries analysed.

Population ageing as a whole has to be addressed in a holistic manner which includes policies throughout the life cycle to ensure that people can stay healthy and active for a longer time, are well prepared to be able to age well in terms of income security and health, strengthening the rights of older persons, and providing an age-friendly environment. Policy actions are included in the 2002 Madrid International Plan of Action on Ageing.

The policy discussion and resulting recommendations in this paper focus on measures to maintain or increase economic growth in the context of population ageing, under the assumption that Governments will have to increase absolute spending on social welfare, which is considered as a necessary condition in ageing societies. The recommendations focus on the three areas people, (labour force) participation, and productivity.

**People: increasing the working-age population**

The working-age population can be augmented by (a) increasing fertility levels and (b) by encouraging migration. While the former comes with a time lag, the latter is often considered as an immediate option of increasing the working-age population and can be an opportunity to attract people with skills that are in demand in the country. However, immigrants will age as well, while having contributed less time to paying into some social security system themselves. Also, as shown in a study on replacement migration (United Nations, 2001), the levels of migration needed to offset population ageing (i.e., maintain potential support ratios) in the future for many countries in the world are extremely high, and in all cases entail vastly more immigration than has occurred in the past. Thus, immigration at current levels cannot offset population ageing observed in many countries.

The simulations show that the gains from increasing fertility are relatively limited but are higher in countries with very low fertility. Thus, raising the numbers in the working-age population should be considered only by countries with very low fertility. It should also be noted that it is the right of every woman or couple to make their own decisions regarding the number, timing and spacing of their children and policies aiming at increasing fertility levels should not counter progress towards gender equality and women’s empowerment.

The following policies can be considered to raise the working-age population:

- Policies allowing more regular and orderly migration, in some cases targeted at certain skill levels or professions that are in demand in the countries of destination, including promoting skill recognition and portability of social security agreements.

- Policies encouraging higher fertility while at the same time promoting gender equality, women’s education and women’s labour force participation. For example:
  - Increasing availability of childcare and providing subsidized childcare: Providing affordable childcare reduces the opportunity costs of having children, particularly for women, and allows both parents to continue participating in the (paid) labour force.
Paid parental leave, particularly for fathers: paid parental leave is an option to combine having children while not having to quit a job. Experience has also shown that paid maternity leave is an option to promote both higher fertility and gender equality, so that maternity leave does not turn into a barrier for women in the labour market.

Providing childcare via direct cash payments and/or indirectly via subsidies and tax breaks to providers. Strong regulations are also important, such as licensing and training requirements that maintain good quality of childcare at different price points and across various locations.

Participation: increasing labour force participation

Labour force participation can be increased by providing more opportunities for women and older persons to (re)join the labour force, which for the latter means extending the retirement age in countries with high coverage of retirement benefits. Especially countries with relatively low female LFPRs can materialize large gains by increasing women’s participation. In countries where it is already high, other options, such as delaying the retirement age and/or considering more immigration could be considered as well.

Women’s labour force participation can be increased through:

- Removing barriers, including legal barriers and discriminatory practices in the workplace but also outside the workplace, for example, concerning property rights, taxation, free movement and travel. Overcoming some of these barriers requires a longer process of societal change and changing perceptions.
- Promoting more flexible work arrangements allowing women to more easily balance looking after their children and older family members and providing workplaces conducive to the employment of women.
- Providing an enabling environment to address unpaid care work that is often provided by women; for instance, providing affordable professional quality childcare.
- Providing opportunities for fathers to take paternity leave which will allow mothers to remain in the workplace.

Labour force participation of older persons can be increased through:

- Providing universal access to health care throughout the life cycle to enhance own health, health of family members, and caring responsibility.
- Investing in preventive health care and promoting healthy habits, such as reducing smoking and substance abuse, and promoting exercise.
- Removing barriers caused by discrimination and social norms, and expanding incentives created by laws, tax-benefit systems.
- Promoting skills development and life-long learning, especially when changing to different tasks, and improving workplace conditions, such as employer flexibility and adjustments to take account of different capacities, skills and experiences.
- Gradually increasing pensionable ages which would also enhance the sustainability of pension systems and can lead to higher pension benefits by increasing the contribution period and reducing the benefit period. The same pensionable age for men and for women should be implemented.
• Encouraging more flexible working arrangements throughout the life cycle that allow breaks for caregiving and other breaks that also allow extension of the retirement age.

Productivity: increasing productivity
Investing in human and physical capital is crucial to raise productivity, such as through:
• Investing in quality education throughout the life cycle; providing opportunities for continuing education while working; on-the-job training of new skills and having employees focus on their strength rather than their problem areas
• Strengthening contributory pension systems and increasing their coverage is crucial to ensure capital deepening in ageing societies. Moreover, pension systems should ensure intergenerational consumption smoothening and reduce the risk of falling into poverty in old age. Since most countries already have some form of contributory pension systems, expansion and reform and existing pension systems will be important.
• Increasing formalization of the labour force to augment productivity and facilitate increasing coverage of pension systems. This includes educating and empowering entrepreneurs but also reforming the tax benefit design and accounting requirements, which are often a barrier to formalization for many entrepreneurs.
• Creating innovative approaches that increase the incentive to join social insurance schemes, including matched contributions.

Countries will have to work comprehensively and simultaneously on all the three area: people, (labour force) participation and productivity. There are often synergistic effects between policies, but emphasis may also vary contingent on the demographic and economic situation of each country. Measures to increase productivity and expand coverage of existing pension systems will be crucial for countries in all demographic stages. Furthermore, efforts to this effect will have long-lasting positive social and economic impacts on populations as they age, and thus significantly benefit society as a whole.
References


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The Economic and Social Commission for Asia and the Pacific (ESCAP) serves as the United Nations' regional hub promoting cooperation among countries to achieve inclusive and sustainable development. The largest intergovernmental platform with 53 member States and 9 associate members, ESCAP has emerged as a strong regional think-tank offering countries sound analytical products that shed insight into the evolving economic, social and environmental dynamics of the region. The Commission's strategic focus is to deliver on the 2030 Agenda for Sustainable Development, which it does by reinforcing and deepening regional cooperation and integration to advance connectivity, financial cooperation and market integration. ESCAP’s research and analysis coupled with its policy advisory services, capacity building and technical assistance to governments aim to support countries’ sustainable and inclusive development ambitions.

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